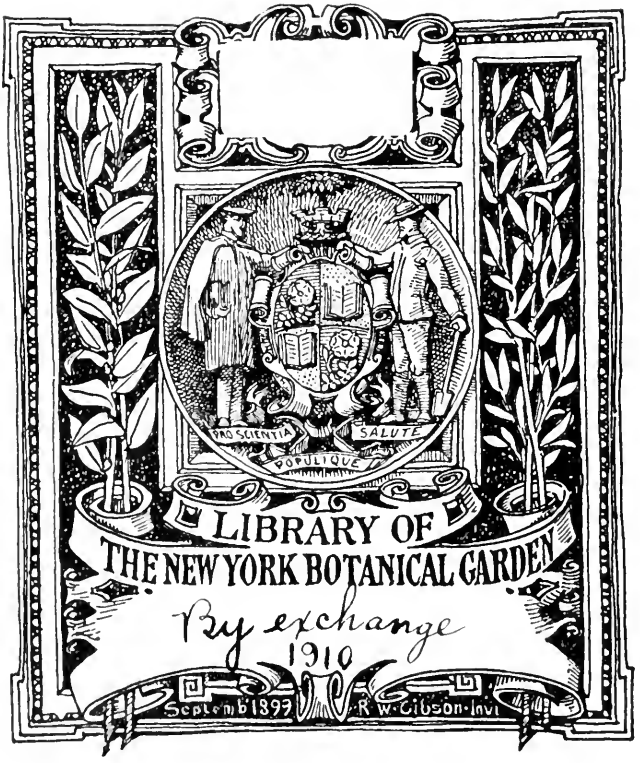

LIBRARY OF
THE NEW YORK BOTANICAL GARDEN
By exchange
1910
Septemb 1899
R. W. Gibson. Invt.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Melville	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

DIVISION OF OIL INSPECTION.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
W. A. Syme*	State Oil Chemist.
Manlius Orr	Assistant Oil Chemist.
George Little	Oil Clerk.

*Died December 15, 1909.

E. M. UZZELL & CO., PRINTERS, RALEIGH.

RALEIGH, N. C., January 8, 1910.

SIR:—I submit herewith manuscript covering the inspection of illuminating oil in North Carolina since July 1, 1909, when the act became effective; also some general information concerning kerosene oil, lamps, etc.

This bulletin was prepared by the late Dr. W. A. Syme, whose death occurred December 15, 1909. I recommend its publication as a special bulletin of the Department of Agriculture.

Very respectfully,

MANLIUS ORR,
Assistant Oil Chemist.

To HON. W. A. GRAHAM,
Commissioner of Agriculture.

Dr. William Anderson Syme, *son of the late* Mr. Andrew Syme *and* Mrs. Annie Bryan Syme, *was born July 11, 1879, in Raleigh, N. C.*

He was prepared for college at the Raleigh Male Academy, taking high honors in his classes, and entered the sophomore class of the A. and M. College in the fall of 1896, graduating in 1899 with the degree of B. S. In the fall of 1903 he entered Johns Hopkins University, and three years thereafter had the degree of Doctor of Philosophy conferred upon him by that institution—the highest honor within its gift. Before completing his course at the Johns Hopkins University he was elected Assistant Professor of Chemistry in the A. and M. College and Assistant Chemist to the Experiment Station, which position he filled with eminent success.

A year ago Dr. Syme *was elected President of the North Carolina Section of the American Chemical Society—a high testimonial of the esteem of his professional associates. He was the author of several treatises, the most conspicuous among them being his dissertation on "Some Constituents of the Poison Ivy" and "The Colorimetric Determination of Nitrates in Soil Solutions Containing Organic Matter."*

Upon the organization of the Division of Oil Inspection by the N. C. Agricultural Department he was appointed State Oil Chemist in May, 1909, and filled that position until his death on December 15, 1909.

He was efficient and painstaking in his duties, and if spared would have reached a high position in his profession.

W. A. Syme

INSPECTION OF ILLUMINATING OILS AND FLUIDS.

INTRODUCTION.

The Division of Oil Inspection of the North Carolina Department of Agriculture was organized by the Board of Agriculture in June, 1909, for the purpose of carrying out an act of the General Assembly providing for the inspection of illuminating oils and fluids. The act (ch. 554, Laws of 1909) is as follows:

AN ACT TO PROVIDE FOR THE INSPECTION OF ILLUMINATING OILS AND FLUIDS.

The General Assembly of North Carolina do enact:

SECTION 1. That all kerosene or other illuminating oils sold or offered for sale in this State for illuminating purposes shall be subject to inspection and test to determine the safety and value for illuminating purposes. All manufacturers, wholesalers and jobbers, before selling or offering for sale in this State any kerosene or other oil for illuminating purposes, shall file with the Commissioner of Agriculture a statement that they desire to do business in the State, and furnish the name or brand of the oil or oils which it is desired to sell, with the name and address of the manufacturer, and that the oil or oils will comply with the requirements of this act. The Department of Agriculture shall have power at all times and at all places to have collected samples of any illuminating oils offered for sale, and have the same analyzed. The inspection of oils, as authorized in this act, shall be under the direction of the Board of Agriculture, which is authorized to make all necessary rules and regulations for the inspection of such oils and to adopt standards as to safety, purity or absence from objectionable substances and luminosity when not in conflict with the provisions of this act and which they may deem necessary to provide the people of the State with satisfactory illuminating oil.

SEC. 2. The Board of Agriculture shall appoint such number of oil inspectors as will be necessary, not exceeding one for each congressional district, whose compensation shall be fixed by the Board of Agriculture, not to exceed one thousand dollars and expenses each per annum. Each inspector, before entering upon his duties, shall take an oath of office before some person authorized to administer oaths. The inspector shall have power to examine all barrels, tanks or other vessels containing kerosene or other illuminating oils, to see that they are properly tagged as required in this act, and they shall, as directed, collect and test samples of oil offered for sale in different sections of the State, and when instructed collect and send samples to the Department of Agriculture for examination.

SEC. 3. For the purpose of defraying expenses connected with the inspection, testing and analyzing oils in this State, there shall be paid to the Commissioner of Agriculture a charge of one-half cent per gallon, which payment shall be made before delivery to agents, dealers or consumers in this State. Each barrel, tank, tank car or other container of oil shall have attached thereto a tag or stamp stating that all charges specified in this section have been paid; and the Commissioner of Agriculture, with the advice and consent of the board, is hereby empowered to prescribe a form for such tags: *Provided*, that they shall be such as to meet the requirements of the trade in oils, and to adopt such rules and regulations as will insure the enforcement of this law. Where oil is shipped in tank cars or other larger containers, the manufacturer or jobber shall give notice to the Commissioner of Agriculture of every shipment, with the name and address of the person, company or corporation to whom it is sent, and the number of gallons, on the day the shipment is made.

SEC. 4. All moneys received under the provisions of this act shall be paid into the State Treasury and kept as a distinct fund, to be styled "the oil inspec-

tion fund." All checks or orders in payment for tags or stamps shall be made payable to the State Treasurer. The Commissioner of Agriculture is authorized to draw out of said fund, upon his warrants, such sums as may be necessary to pay all expenses incurred in connection with this act, including salary of oil chemist or chemists, cost of inspection, tags, blanks, etc.

SEC. 5. The State Treasurer shall, on the first day of June and December each year, turn into the general fund of the State all moneys of the oil fund in his hands in excess of the amount drawn out by the Commissioner of Agriculture for expenses.

SEC. 6. The Commissioner of Agriculture shall include in his report to the General Assembly an account of the operations and expenses under this act.

SEC. 7. Whenever a complaint is made to the Department of Agriculture in regard to the illuminating qualities of any oil sold in this State the commissioner shall cause a sample of said oil or oils complained of to be procured and have the same thoroughly analyzed and tested as to safety and illuminating qualities. If such analysis or other tests shall show that the oil is either unsafe or of inferior illuminating quality, its sale shall be forbidden and report of the result or results be sent to the party making the complaint and to the manufacturer of said oil.

SEC. 8. Every person who shall fraudulently brand or stamp any package or barrel or other vessel, or use a stamp a second time, or keep any kerosene or other illuminating oil not marked and branded in accordance with the regulations of the Board of Agriculture, or violate any other provision of this act or any regulation adopted by the Board of Agriculture for its enforcement, shall be guilty of a misdemeanor and fined not less than two hundred dollars ($200) for each offense nor more than one thousand dollars ($1,000).

SEC. 9. If any person, manufacturer or dealer shall sell or offer for sale in this State any of said illuminating oils and fluids before first having the same labeled and tagged as required by the regulations adopted by the Board of Agriculture, he shall be guilty of a misdemeanor and on conviction be fined not exceeding three hundred dollars ($300), and the said oils and fluids be forfeited and sold, and the proceeds thereof go to the common school fund of the State. If any manufacturer or dealer of said illuminating oils or fluids shall, with intent to deceive or defraud, alter or erase the label or tag to indicate a different flash test, gravity or quantity than is indicated by the label or stamp attached to the vessel, he shall on conviction be fined not exceeding fifty dollars ($50) for every such offense.

SEC. 10. Any inspector who, while in office, shall be interested, directly or indirectly, in the manufacture or vending of any of the illuminating oils, shall be guilty of a misdemeanor, and on conviction shall be fined not less than three hundred dollars ($300).

SEC. 11. All prosecutions for fines and penalties under the provisions of this act shall be by indictment in a court of competent jurisdiction.

SEC. 12. The provisions of this act shall not apply to the retail dealer in oils unless such retail dealer shall sell or offer to sell oils of a manufacturer, wholesaler or jobber who refuses to comply with the provisions of this act.

SEC. 13. This act shall be in force from and after July first, one thousand nine hundred and nine.

Ratified this the 8th day of March, A. D. 1909.

By virtue of the authority conferred upon the Board of Agriculture by the act, regulations governing the work of inspection were drawn up by the Commissioner of Agriculture and the Oil Committee of the Board. Representatives of the oil companies doing business in the State were invited to be present at the meeting of the Board in June and at subsequent meetings of the Oil Committee in order that the regulations for putting the act into effect might be so adjusted as to give as little trouble as possible to all concerned. The regulations now in force are as follows:

REGULATIONS OF THE DEPARTMENT OF AGRICULTURE CONCERNING ILLUMINATING OILS AND FLUIDS.

[CHAPTER 554, LAWS OF 1909.]

1. The statement required of manufacturers and others desiring to sell oil in this State, in section 1 of this act, shall be in substance as follows:

COMMISSIONER OF AGRICULTURE,
Raleigh, N. C.

The ..... desires to sell in North Carolina the following brands of illuminating oils:

(1) (Name) .....

(2) (Name) .....

Manufactured or sold by ....., whose address is ..... P. O..... And it is stipulated that said oils shall comply with the requirements of chapter 554, Laws of 1909, and the regulations of the Board of Agriculture made by authority of said act.

(Signature).....

2. There shall be placed upon each tank car before the same is emptied, and upon all other original packages, tax stamps as required in section 3 of chapter 554, Laws of 1909; also the name under which the oil is sold, the name of the manufacturer or wholesale dealer and the date of filling. No tax stamps shall be required upon a vessel filled from a container upon which the tax has been paid, but same must show the amount of oil it contains, the location of the tax-paid container from which it was filled, and the date of filling.

Where wagons are filled from stationary tanks they must have attached the location of such tanks, and all invoices for oil to retail dealers delivered from such wagons shall show the name of station from which operated and number of gallons sold.

3. Where oil is brought into this State in wagons, each wagon must have stamps attached to cover the amount of oil it contains, and with each and every sale in this State from such wagons there must be given a statement, invoice or tag, showing the name of the company operating the wagon, number of the wagon, quantity of oil sold and date of sale.

Where oil is brought into this State in wagons which also contain oil for sale in other States, a separate compartment must be provided in such wagons for oil sold or offered for sale in North Carolina, and stamps must be attached to said compartment to cover the amount of oil it contains; and with each and every sale in this State from such compartment there must be given a statement, invoice or tag, showing the name of the company operating the wagon, number of the wagon, quantity of oil sold and date of sale. Unless this separate compartment is provided, oil companies will have to pay the tax on all oil brought into this State in wagons.

4. By authority of section 2 of said act, there shall be appointed ten inspectors.

5. Each inspector shall examine all tank cars, barrels, drums, cans or other containers found in his district, and in other districts when directed by the

Commissioner; see that the law is fully complied with, and collect samples as directed and send to the Department for analysis by the State Oil Chemist.

6. Each inspector shall receive three dollars per day and actual expenses while at work.

7. The Commissioner of Agriculture shall have prepared tax stamps of such denominations and in such quantities as may be deemed necessary to execute this act. The Secretary of the Board shall have charge of these stamps and deliver to the Oil Clerk from time to time such amounts as will be necessary to supply the demand, and shall make settlement quarterly of the amounts of tags disposed of.

8. All kerosenes or other oils usually used for illuminating purposes offered for sale or sold in this State for other use shall have plainly marked on the container in letters at least two inches high, or plainly printed on a tag attached thereto, "Not for Illuminating Purposes. Highly Inflammable." Such oil is not subject to taxation. Using or selling it for illuminating purposes shall be a violation of section 8 of the act.

9. Shipment by car load of oil in barrels, drums or other containers shall be reported to the Commissioner, as is required for shipment in tank cars or other large containers by section 3, chapter 554, Laws of 1909.

10. No person shall offer to a common carrier for shipment empty barrels used for illuminating oils upon which the tax stamps have not been canceled.

11. The record of the tank-car book furnished by the railroad companies as to the capacity of each tank car will be accepted by the Department.

12. The flash test of illuminating oils shall not be less than 100 degrees Fahrenheit, as tested by the Elliott method—closed cup—according to directions prepared by the State Oil Chemist.

13. The State Oil Chemist shall analyze such samples as deemed necessary to ascertain safety and objectionable substances, purity and luminosity, and report to the Commissioner of Agriculture any standards he deems advisable to be established in these particulars.

14. The Commissioner, with the approval of the Oil Committee, may suspend or change any of these regulations until the ensuing meeting of the Board.

W. A. GRAHAM.
Commissioner.

RALEIGH, N. C., December 21, 1909.

The work of the ten inspectors consists in the collection of samples of oils, which are sent to the laboratory at Raleigh for analysis by the Oil Chemist, and in the cancellation of stamps, gauging of vessels containing illuminating oils, and seeing that they are properly labeled. It is also their duty to see that the law and regulations are carried out in every way. This work, which entails a voluminous correspondence, is handled by the Oil Clerk of the Department of Agriculture. It is also the duty of the Oil Clerk to deliver the stamps to the oil companies and dealers upon the demand for the same and to make settlement with the State Treasurer for the quantity delivered. He also keeps the books and records of the office.

SOURCE OF KEROSENE.

Kerosene oil is a natural product obtained from petroleum by the process of distillation.

Crude American petroleum is an interesting and complex mixture of a great number of compounds known in chemistry as "hydrocarbons." These substances are composed entirely of carbon and

hydrogen, and are closely related chemically, though their physical properties are different. They may be divided roughly into two classes. The simplest of these compounds are gases like marsh gas, the "fire damp" of coal mines. When mixed with air in proper proportions these gases are dangerous explosives. The second group contains liquids of different degrees of volatility and gravity from the light benzine or petroleum ether to the heavy lubricating oils. Kerosene falls in the middle portion of this group. The third group contains solids and is the source of our vaseline and paraffin wax.

All these different substances are found intimately blended by nature in the homogeneous-looking crude petroleum. The method of separating the crude material into these various useful products is essentially a process of fractional distillation. When crude petroleum is heated in a distilling apparatus the explosive gases are driven out first. As the temperature rises the volatile liquids, like petroleum ether and benzine, come off. Roughly speaking, this portion distils between 40° C. and 150° C. On further increase in the heat, the portion known as kerosene distils. A good kerosene should distil between 150° C. and 300° C. This portion is used on a large scale for lighting and cooking. That part of the crude petroleum which remains in the still above 300° C. contains the heavy oils and vaseline.

Kerosene is usually a colorless or yellowish liquid, often having a decided blue fluorescence. It imparts its characteristic taste to water, although it is practically insoluble in that liquid. It is only slightly soluble in alcohol, but mixes in all proportions with ether, chloroform, benzine, gasoline, and fixed oils, except castor oil. It is a good solvent for many organic substances, and will also dissolve phosphorus, sulphur, and iodine. The specific gravity of ordinary American kerosene is about 0.790 to 0.80 (47 degrees to 45 degrees Baumé).

TESTING OF KEROSENE OIL.

For contract purposes, the color, odor, specific gravity and flashing point are the characters usually to be determined. The burning point or fire test is sometimes taken instead of the flash test; but this is not to be recommended. Of these, the flash test is the one most generally recognized in legal enactments for securing safety. For special purposes, it is often necessary to examine kerosene as to its composition as ascertained by fractional distillation, its illuminating power as determined by photometric tests, its freedom from sulphur compounds, its acidity or alkalinity and the amount of ash or mineral matter which it will leave on complete combustion.

Good kerosene should be water-white or light yellow, with or without blue fluorescence. A decided yellow color often indicates im-

perfect purification or the presence of heavy oils. Kerosene which has been exposed to light often acquires a yellow color and does not burn as well as the same oil would burn if protected from light.

The gravity test is usually made with a hydrometer, but when greater accuracy is required a weighing tube or a picnometer is used. Oils of high gravity do not ascend the wick as well as lighter oils, do not give as much light, and char the wick.

A test of kerosene oils by burning them in similar lamps and noting the rates of consumption and the comparative intensities of light yielded gives a good idea of the nature of the oil. Kerosenes containing a large proportion of light oils give a better light, but burn faster than others, while the presence of heavy oils retards the consumption and diminishes the light. An oil containing an excess of both light and heavy oils may give a good light at first, but after a while the flame will diminish in size and luminosity, and the wick will begin to char. The absence of an objectionable portion of heavy oil as indicated by a distillation test, and the light-giving power, are important characteristics in judging the quality of a sample of kerosene.

FLASH TEST.

The flash test determines whether an oil is safe for household use. The danger involved in the use of kerosene is traceable to the presence in the oil of some of the volatile products whose vapor forms an explosive mixture with air. For the purpose of ascertaining whether a sample of kerosene contains these more volatile substances its *flash-point* is determined by heating it slowly in a specially constructed apparatus and observing the temperature at which the mixture of vapor and air over the surface of the oil can just be exploded. By the flash-point, then, we mean the temperature at which the oil will give off a vapor that will explode when mixed with air in proper proportions. Any kerosene oil, therefore, is dangerous at its flashing temperature, but experience has shown that there is very little danger with a flashing temperature of 100° F. The flash-point should be higher than any temperature to which the oil is exposed. Since the temperature in the climate of North Carolina often goes above 90° F., to say nothing of the temperature in the bowl of the lamp, which is several degrees higher than the outside air, the Board of Agriculture requires that all illuminating oils sold in the State shall stand a flash test of 100° F. in the Elliott Closed Cup.

There are several instruments in common use for making the flash test, but the Elliott Cup is regarded as the most accurate for ordinary use, for the reason that it indicates more exactly the temperature at which the oil begins to give off an explosive vapor.

A number of factors influence the determination of the flash-point of an oil and cause it to vary according to the conditions under which the test is made, *e. g.*, the rate of heating, the size and depth of the cup, the quantity of oil taken for the test, currents of air—in fact, any cause producing the rapid evolution of a large amount of vapor tends to lower the flash-point. Different types of instruments for taking the flash-point also give different results. This fact is brought out in Table 1, which gives the flash-point of a number of samples made with the Elliott Cup, the Open Tagliabue Cup, and the Foster Cup. The results with the Elliott Cup are uniformly lower than the others.

TABLE I.

Oil Number.	Laboratory Number.	Elliott Flash.	Tagliabue Flash.	Foster Flash.
1	----------	100 Deg. F.	108 Deg. F.	117 Deg. F.
2	----------	85 " "	----------	100 " "
3	----------	100 " "	107 " "	116½ " "
4	----------	99 " "	108 " "	118 " "
5	----------	100 " "	108 " "	---
6	1	114 " "	129 " "	138 " "
7	2	104 " "	112 " "	123 " "
8	3	92 " "	103 " "	109 " "
9	4	100 " "	112 " "	117½ " "
10	5	92 " "	108 " "	113 " "
11	6	93 " "	107 " "	113 " "
12	7	90 " "	102 " "	108 " "
13	8	86 " "	104 " "	112 " "
14	9	110 " "	130 " "	130 " "
15	10	92 " "	104 " "	110 " "
16	12	110–112 " "	128 " "	133 " "
17	13	112 " "	129 " "	135 " "
18	14	88 " "	102 " "	110 " "
19	15	90–92 " "	100 " "	109 " "
20	16	112 " "	133 " "	140½ " "
21	17	90 " "	104 " "	113 " "
22	18	92 " "	106 " "	109 " "
23	19	110 " "	135 " "	134 " "
24	25	107 " "	134 " "	134½ " "
25	29	97 " "	109 " "	---
26	31	108 " "	132 " "	---
27	73	85 " "	99 " "	107 " "
28	75	109 " "	129 " "	132 " "

RELATION BETWEEN FLASH-POINT AND DANGER.

Danger from explosions is always present when inflammable vapors and air are mixed together. This condition may arise in the bowl of any lamp, for above the liquid kerosene there is always kerosene vapor and there is always air, the proportions of each depending upon the temperature of the oil. The higher the temperature, the greater the proportion of the oil vapor. The explosion is most violent when the amount of air present is exactly sufficient to burn the vapor completely. This proportion is about 50 volumes of air to one volume of oil vapor. An excess of either air or oil vapor above this proportion serves as a cushion to moderate the force of whatever explosion does occur. Of course, an explosion cannot take place unless the flame reaches the inflammable mixture. Contact between the explosive mixture and the flame is frequently brought about by the use of a wick too small for the burner.

The danger of explosion in lamps having metal reservoirs is infinitely less than in glass lamps. The reason for this lies in the fact that glass being a poor conductor of heat, the oil in the lamp does not get as hot as in the metal vessels, consequently an explosive mixture of oil vapor and air (one volume to fifty) would be more readily reached in the glass lamp than in the metal lamp, where the proportion of oil vapor is much greater. When the oil vapor is in great excess the mixture is not explosive.

If low-flash oils be spilled and a flame applied, the fire spreads much more rapidly than with an oil of high flash-point, and thus the upsetting of a lamp containing low-flash oil is more dangerous than if it contained oil of higher flash, especially if the temperature of the oil be somewhat raised, as is usually the case. If a lighted lamp filled with high-flash oil is upset, it will most probably be extinguished, for this kind of oil will not only not ignite at ordinary temperatures, but will extinguish flame.

ILLUMINATING POWER.

In securing a safe oil, we must not lose sight of the fact that heavy oil does not give good light except with burners of strong draught. As already stated, it causes charring of the wick. It is the purpose of the oil-inspection law to secure for the State oil of good illuminating power as well as safe oil, and the Board of Agriculture is authorized to adopt such standards for luminosity as may be deemed necessary to insure this. It has been thought advisable not to adopt at present a fixed standard for luminosity in candle power, although this may be done later.

Newberry & Cutter in an article on The Safety of Commercial Kerosene Oil (Amer. Chemical Journal, vol. 10, p. 361), say: "If

refiners would be content to make a little less oil, leaving out some of the benzine, and some of the lubricating oil as well, there would be no difficulty in producing illuminating oils of high flashing point and excellent illuminating power.

"The well-known astral oil, which flashes at 125° F., is a standing protest against the claim of superior burning qualities of low-grade oils. This is simply the *heart* of the burning oil freed from both lighter and heavier deleterious ingredients. Tests made by the authors have shown that the above-mentioned brand burns admirably in modern lamps and by photometric tests gives results fully equal to any in the market."

There are some excellent oils of comparatively low gravity, high flash, and uniform composition, as shown by the distillation test, and good illuminating power, now on the market in this State. Oils of this kind burn uniformly with a clear, steady flame, without smoking and with very little charring and incrustation of the wick. It is the wish of the Division of Oil Inspection to secure this kind of oil for the State, and the oil companies have expressed a desire to cooperate with the Department for this purpose.

SULPHUR.

Sulphur compounds not only have an injurious effect upon the illuminating power of kerosene, but produce corrosive and poisonous gases when the oil is burned. Sulphur is present to a small extent in natural oils. The peculiar bad color of some of the Ohio oils was found to be due to the presence of an unusually large amount of sulphur compounds.

CARE OF LAMPS.

In order to have good light, we must have good lamps as well as good oil. Lamps must be kept clean.

When oil burns in a lamp the lighter portions burn out first. Consequently, after filling a lamp several times there is an accumulation of heavy oil in the lamp which does not burn well. This oil should be poured out and the lamp should be rinsed out with good oil and refilled. Keep the burners clean and remove the charred portion of the wick. The oil should be kept in clean cans or bottles and should be protected from dust, water and sunlight. Water in the oil causes a spluttering light. Wicks should fit the wick-holder snugly without having to be squeezed into it. After each night's use, the charred portion of the wick should be removed. When the wick gets too short to reach to the bottom of the lamp, put in a new one. Coloring matter does not improve the quality of oil, but may accumulate in the pores of the wick and so retard the passage of the oil through it.

The following is a list of the oil companies and wholesale dealers in kerosene oil who have registered the brands of oils they desire to sell in North Carolina, named in the order of their compliance with paragraph 1 of the regulations:

Company.	Date.	Name of Oil.
	1909.	
Cape Fear Oil Co., Wilmington, N. C.	June 12	1. Water-white 150° fire test.
Standard Oil Co. (New Jersey), Baltimore, Md.	June 29	1. Aladdin Security Oil. 2. Diamond White Oil. 3. Pratt's Astral Oil. 4. Carnadine. 5. Red Oil. 6. Mineral Seal Oil.
North Carolina Oil Co., High Point, N. C.	July 1 and Nov. 20	1. Soline Oil. 2. Red Soline Oil. 3. Red Radium Oil. 4. Crystal Oil. 5. Red Crystal Oil. 6. Extra Water-white Oil.
Crown Oil and Wax Co., Baltimore, Md.	July 1	1. Soline Oil. 2. Red Soline Oil.
National Oil Co., Norfolk, Va., and Baltimore, Md.	July 1 Sept. 23 Oct. 14	1. White Star Oil. 2. Red Star Oil. 3. White Banner Oil. 4. Red Banner Oil. 5. White Superba Oil. 6. Red Superba Oil. 7. North Carolina Test White Oil. 8. North Carolina Test Red Oil. 9. Elbro Oil. 10. Eureka Oil. 11. Perfection Oil. 12. Brilliant Oil.
Richmond Oil Co., Richmond, Va.	July 19 Sept. 28	1. Electric Safety White Oil. 2. Electric Safety Red Oil. 3. Star Oil. 4. Crystal White Oil. 5. Crystal Red Oil. 6. Vesper White Oil. 7. Vesper Red Oil. 8. Hy-Lite White Oil. 9. Hy-Lite Red Oil.
Standard Oil Co. (Inc.) of Kentucky, Covington, Ky.	Aug. 14 Sept. 29 Nov. 24	1. Fire-proof Oil. 2. Diamond Headlight Oil. 3. Eocene Oil. 4. Prime White Oil.
Red "C" Oil Mfg. Co., Baltimore, Md.	Sept. 27	1. Sunbeam Oil. 2. Aurora Oil. 3. Aurora Red Oil. 4. Columbia Headlight Water-white Oil. 5. Garnet Red Safety Oil. 6. Astral Oil. 7. The White "C" Oil. 8. The Red "C" Oil.
M. I. Gump, Wholesale Grocer, Johnson City, Tenn.	Sept. 27	1. Diamond Headlight Oil. 2. Fire-proof Oil 3. Eocene Oil.
Chas. H. Moore Co., Cincinnati, Ohio.	Sept. 28	1. Faultless Oil. 2. Monitor Oil. 3. White Light Oil. 4. Crystalline Oil. 5. Agate Prime White Oil.
Indian Refining Co., Cincinnati, Ohio.	Sept. 30	1. Indian Fancy Burning Oil. 2. Fancy Water-white Oil.

Company.	Date.	Name of Oil.
	1909.	
Indian Refining Co., Cincinnati, Ohio.	Sept. 30	3. Blue Grass Oil. 4. Brilliant Light Oil. 5. Starlight Oil. 6. Water-white Oil. 7. Prime White Oil.
Petroleum Oil Co., Anderson, S. C.	Oct. 28	1. Crystal Oil.
Madison Grocery Co., Madison, N. C.	Nov. 3	1. Water-white Oil, 150° fire test. 2. Ruboline Red Oil, 150° fire test. 3. Prime White Oil, 150° fire test.
Freedom Oil Works, Freedom, Pa.	Nov. 5	1. Extra Water-white Oil, 150° fire test. 2. Extra Prime White Oil, 150° fire test. 3 Garnet Red Illuminating Oil, 150° fire test 4. Ruboline Red Illuminating Oil.
Gulf Refining Co., Atlanta, Ga.	Nov. 17	1. Water-white Oil, 150°.
A. P. Henderson & Sons, Wholesale Grocers, Johnson City, Tenn.	Nov. 17	1. Fire-proof Oil. 2. Diamond Headlight or Prime White Oil.
Blalock Hardware Co., Wadesboro, N. C.	Nov. 18	1. Radium Oil (made by Gulf Refining Co.). 2. Red "C" Oil (made by Red "C" Oil Mfg. Co.).

EXAMINATION OF SAMPLES.

The examination of samples sent in by inspectors was commenced early in July, but was discontinued on account of a restraining order of the United States Circuit Court while the constitutionality of the law was being tested. After the dissolution of the restraining order, the testing of oils was resumed.

The oil companies were granted an extension of time until October 20, 1909, to remove from the State all oil flashing below 100° F. Up to this time (October 20th) 329 samples of illuminating oils were examined. The following table gives the number of samples from each of the oil companies doing business in the State and the per cent of the total number of samples furnished by each of the several companies up to October 20th:

Name of Company.	Samples.	Per Cent of Total.
Standard Oil Company	207	62.91
Red "C" Oil Manufacturing Company	70	21.27
National Oil Company	21	6.37
North Carolina Oil Company	12	5.77
Crown Oil and Wax Company	7	
Cape Fear Oil Company	3	3.68
Gulf Refining Company		
Indian Refining Company	3	
Richmond Oil Company	2	
Chas. H. Moore Company	2	
Freedom Oil Company	1	
Unknown sample	1	
Total number of samples	329	100.00

It is interesting to note the gradual rise in flash-point since the first of July, especially in the samples of the Standard Oil Company. This is shown in the following tables:

STANDARD OIL COMPANY.

Average flash-point of	13 samples	collected in July	92.6° F.
" " "	57 "	" in September	98.0° F.
" " "	125 "	" October 1st to 20th	104.0° F.
" " "	12 "	" October 20th to November 1st	103.7° F.
Total	207 samples.		

RED "C" OIL MANUFACTURING COMPANY.

Average flash-point of	18 samples	collected in July	103.5° F.
" " "	29 "	" in September	108.7° F.
" " "	19 "	" October 1st to 20th	109.4° F.
" " "	4 "	" October 20th to November 1st	110.0° F.
Total	70 samples.		

NATIONAL OIL COMPANY.

Average flash-point of	4 samples	collected in July	91.70° F.
" " "	7 "	" in September	100.05° F.
" " "	9 "	" October 1st to 20th	109.00° F.
" " "	1 "	" October 20th to November 1st	109.00° F.
Total	21 samples.		

NORTH CAROLINA OIL COMPANY.

Average flash-point of	8 samples	collected in July	108.00° F.
" " "	4 "	" in September	108.00° F.
Total	12 samples.		

CROWN OIL AND WAX COMPANY.

Flash-point of	1 sample	collected in July	107.00° F.
" "	6 samples	" " September	118.00° F.
Total	7 samples.		

None of the samples sent in by the other oil companies named above flashed as low as 100° F., even in July. In fact, the only companies which had oil flashing under 100° F. were the Standard

Oil Company, the Red "C" Oil Manufacturing Company, and the National Oil Company; but these three companies together furnished 90 per cent of the samples examined.

The following table gives some idea of the distribution of the bad oil (*i. e.*, oil flashing under 100° F.) over the State before October 20, 1909:

First District	3 samples.
Second District	8 samples.
Third District	6 samples.
Fourth District	5 samples.
Fifth District	5 samples.
Sixth District	3 samples.
Seventh District	7 samples.
Eighth District	3 samples.
Ninth District	7 samples.
Tenth District	6 samples.
Total	53 samples

or 16.1 per cent of the total number examined.

The following table shows the results of the inspection of samples received up to December 1, 1909.

RESULTS OF THE EXAMINATION OF OILS.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
1	White "C"	Red "C" Oil Mfg. Co.	A. Thomas	Beaufort	116		
2	Sun Beam	do	do	do	104		
3	Bright	National Oil Co.	W. L. Bell	do	92		
4	Aladdin	Standard Oil Co.	O. C. Willis		100		Burning pt. 132° F.
5	Diamond White	do	Beaufort Grocery Co.	Beaufort	92		
6		do	W. H. Byrum & Co.	Franklinton	90		
7		do	J. W. Nowell	do	86		
8	White "C"	Red "C" Oil Mfg. Co.	E. J. Chatham	do	110		
9	Aladdin	Standard Oil Co.	W. F. Dill	Beaufort	94		
10	Sun Beam Safety	Red "C" Oil Mfg. Co.	E. J. Chatham	Franklinton	92		
11	Columbia	do	do	do	92		
12	Red "C"	do	Pierce, Williams & Co.	Youngsville	112		
13	do	do	T. W. Winston	do	112		
14	Sun Beam	do	Tarboro Grocery Co.	Tarboro	88		
15	White Safety	do	R. B. Peters Grocery Co.	do	112		
16	Diamond White	Standard Oil Co.	Murphy-Jenkins Co.	do	92		
17	do	do	D. Cummings & Co.	do	92		
18	Aladdin	do	C. B. Keech & Co.	do	92		
19	White "C"	Red "C" Oil Mfg. Co.	Lile & Ruffin Co.	do			
20	do	do	Staten & Zoeller	do	110		

21	Diamond White	Standard Oil Co.	Theo. Frisbee	Hot Springs			
22	Aladdin	do	do	do			
23	do	do	T. M. Patton	Morganton			
24	do	do	S. L. Whitiner	Hickory			
25	Red "C"	Red "C" Oil Mfg. Co.	Piedmont Grain and Provision Co.	do	103		
26	Sun Beam	do	do	do			
27	Aladdin	Standard Oil Co.	O. A. Costner	Lincolnton			
28	Diamond White	do	do	do			
29	Aladdin	do	E. H. Holmes	Wilmington	93		
30	Soline Red Oil	Crown Oil and Wax Co.	H. C. Eaton	High Point	107		
31	Sun Beam	Red "C" Oil Mfg. Co.	W. R. Pleasant	Greensboro	103		
32	Diamond White	Standard Oil Co.	T. H. Caldwell	Winston-Salem			
33	Soline White	North Carolina Oil Co.	H. C. Eaton	do	103		
34	Crystal	do	do	High Point	105		
35	Diamond White	Standard Oil Co.	T. F. Mangum	Greensboro			
36	Aladdin	do	T. H. Caldwell	Winston			
37		do	Fulps & Rinnille	Kernersville	85		Elliott open cup, 122°.
38	Crystal	North Carolina Oil Co.	H. C. Eaton	Winston-Salem	113		
39	Diamond White	Standard Oil Co.	T. H. Walker	Reidsville			
40	do	do	T. F. Mangum	Greensboro			
41		do	W. H. Chappell	High Point			Said to be "Diamond Brand."
42	Crystal White	Richmond Oil Co.	W. P. Ware	Reidsville			
43	Aladdin	Standard Oil Co.	T. F. Mangum	Greensboro			
44	Red "C"	Red "C" Oil Mfg. Co.	W. R. Pleasant	do			
45	Diamond White	Standard Oil Co.		Gastonia			
46	do	do	J. Flem. Johnson	Kings Mountain			

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
47	Diamond White	Standard Oil Co.	J. Flem. Johnson	Mt. Holly			
48	Aladdin	do	C. C. Beasley	Charlotte			
49	Diamond White	do	do	do			
50	Aladdin	do	T. R. Caffey	Wilkesboro			
51	do	do	do	do			
52	Radium	North Carolina Oil Co.	Feimster & Barnes	Taylorsville	103		
53	Aladdin	Standard Oil Co.	Morrison Lead and Pipe Co.	do			
54	do	do	do	do			
55	Radium	North Carolina Oil Co.	T. R. Barnes	do	109		
56	Aladdin	Standard Oil Co.	Holister & Cox	New Bern			
57	Diamond White	do	do	do			
58	do	do	E. M. Petoway	Jacksonville			
59	Aladdin	do	do	do			
60	Columbia	Red "C" Oil Mfg. Co.	M. B. Humphrey	do			
61	Diamond White	Standard Oil Co.	H. E. Gurley	Goldsboro			
62	Water-white	Red "C" Oil Mfg. Co.	R. J. Rivenbark	do	107		
63	Garnet Red	do	do	do	81		
64	White "C"	Red "C" Oil Mfg. Co.	R. J. Rivenbark	do			
65				Greenville	98		
66	Aladdin	Standard Oil Co.	E. H. Moore	Washington			

67	----do----	----do----	R. C. Mansfield	Edenton		
68	Headlight	Red "C" Oil Mfg. Co.	M. T. Archbell	Washington	112	
69	Columbia	----do----	----do----	----do----		
70	----do----	----do----	Z. N. Leggett	----do----		
71	----do----	----do----	J. O. Procter & Co.	Grimesland		
72	Superba	National Oil Co.	Southern Grocery Co.	Henderson	106	
73	White Star	----do----	----do----	----do----	85	
74	----do----	----do----	Theo. Overby	Woodworth	84	
75	Red "C"	Red "C" Oil Mfg. Co.	Breedlove & McFarland	Oxford	110	
76	Water-white	Gulf Refining Co.	Cape Fear Oil Co.	Wilmington	116	
77	Aladdin	Standard Oil Co.	Standard Oil Co.	Lumberton		
78	----do----	----do----	----do----	Wilmington		
79	----do----	----do----	----do----	Lumberton		
80	----do----	----do----	J. A. Lewis	Southport		
81	----do----	----do----	Standard Oil Co.	Wilmington		
82	Diamond White Headlight	----do----	----do----	----do----		
83	Aladdin	----do----	Henrietta Mills	Forest City		
84	----do----	----do----	Reed & Co.	Rutherfordton		
85	Red Soline	North Carolina Oil Co.	Gilkey Mercantile Co.	Gilkey	109	
86	Aladdin	Standard Oil Co.	E. J. Grose	Marion		
87	----do----	----do----	W. R. Sloop	Asheville		
88	Diamond White	----do----	----do----	----do----		
89	Soline	North Carolina Oil Co.	J. W. Caffey	----do----	109	
90	----do----	----do----	----do----	----do----	109	
91	Aladdin	Standard Oil Co.	Standard Oil Co.	Rocky Mount		
92	Aurora Water-white	Red "C" Oil Mfg. Co.	City Transfer Co.	Greensboro	86	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
93	Diamond White	Standard Oil Co.	J. W. Tucker	Warsaw			
94	White "C"	Red "C" Oil Mfg. Co.	City Transfer Co.	Greensboro			
95	Sunbeam	do	do	do	92		
96	Red "C"	do	Hudson Grocery Co.	do			
97	Diamond White	Standard Oil Co.	R. G. Hiatt & Co.	do			
98	Soline Red	North Carolina Oil Co.	do	do	108		
99	Aladdin	Standard Oil Co.	J. W. Mason	Chapel Hill			
100	do	do	O. F. Craig	University			
101	Diamond White	do	J. H. Boyte	Monroe			
102	Red "C"	Red "C" Oil Mfg. Co.	J. L. Michael	Lexington			
103	White "C"	do	C. C. Sanford Sons Co.	Mocksville			
104	Water-white 150°	Crown Oil and Wax Co.		Baltimore, Md.			Sample sent by manufacturer. Tagliabue open 138°.
105		Standard Oil Co.	A. W. Penson	Louisburg	113	0.80	
106	Aladdin	do	J. Caudell	Henderson	108		
107	Red "C"	Red "C" Oil Mfg. Co.	Geo. A. Rose Co.	do	108		
108	White Star	National Oil Co.	Southern Grocery Co.	do	87	80	
109	Superba	do	do	do	107	.78	
110	Red "C"	Red "C" Oil Mfg. Co.	C. Y. Holding	Wake Forest	108		
111	White "C"	do	W. C. Brewer & Co.	do	107		
112	Diamond White	Standard Oil Co.			96		

113	Aladdin	do			95		
114	Diamond White and Aladdin	do			93		Mixture of two oils.
115	do	do	A. C. Pound	Concord	105		
116	Aladdin	do	do	do	100		
117	Diamond White	do	C. L. Emerson	Salisbury	93		
118	Red "C"	Red "C" Oil Mfg. Co.	Overman & Co.	do	108		
119	Diamond White	Standard Oil Co.	W. E. Milton	Albemarle	91		
120	do	do	J. P. Phifer	Statesville	107		
121	Columbia	Red "C" Mfg. Co.			108		
122	Aladdin	Standard Oil Co.			94		
123	do	do	W. F. Byers	Rutherfordton	97		
124	do	do	do	Caroleen	96		
125	Soline	North Carolina Oil Co.	J. E. Fain	Murphy	112		
126	Aladdin	Standard Oil Co.	Owen Wofford & Co.	do			
127	do	do	J. L. Trotter	Franklin	110		
128	Red "C"	Red "C" Oil Mfg. Co.	J. F. Moore & Co.	do	117	.78	
129	Water-white	Chas. H. Moore & Co.	S. A. Mundy	do	114		
130	Aladdin	Standard Oil Co.	E. L. McKee	Sylva	97	.80	
131	Headlight	Red "C" Oil Mfg. Co.	C. G. Morris & Co.		112	.81	
132	Aladdin	Standard Oil Co.	E. H. Moore	Washington	94	.79	
133	Superba	National Oil Co.	S. A. Beasley	Plymouth	104	.785	
134	Aurora	Red "C" Oil Mfg. Co.	J. R. Jackson	Hertford	111		
135	Aladdin	Standard Oil Co.	N. G. Grandy & Co.	Elizabeth City	87	.81	
136	White "C"	Red "C" Oil Mfg. Co.	J. G. Fearning & Co.	do	116	78	
137	Soline	Crown Oil and Wax Co.	Liles-Ruffin Co.	Tarboro	126	785	Very high flash. Good oil.
138	White Star	National Oil Co.	Murphy, Jenkins & Co.	do	111		

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
139	Aurora White	Red "C" Oil Mfg. Co.	H. M. Wainwright	Wilson	110	.805	
140	Garnet Red	----do	----do	----do	102	.79	
141	Aladdin	Standard Oil Co.	R. B. Crutchfield	----do	98	.80	
142	White "C"	Red "C" Oil Mfg. Co.	Staton & Zoeller	Tarboro	104	.78	
143	Aladdin	Standard Oil Co.	Standard Oil Co.	Rocky Mount	106		
144	Diamond White	----do	H. E. Gurley	Goldsboro	92		
145	Aladdin	----do	----do	----do	106		
146	Garnet Red	Red "C" Oil Mfg. Co.	R. J. Rivenbark	----do	115	.80	
147	Aurora White	----do	----do	----do	110	.81	
148	White "C"	----do	----do	----do	104	.78	
149	Diamond White	Standard Oil Co.	J. W. Tucker	Warsaw	90		
150	White Star	National Oil Co.	Hancock & Smith	Beaufort	95		
151	White Soline	Crown Oil and Wax Co.	W. C. White	Vanceboro	125		
152	Soline Lamp Oil	----do	G. C. Butt	----do	115		
153	Aladdin	Standard Oil Co.	Holister & Cox	New Bern	102		
154	Diamond White	----do	----do	----do	87	.81	
155	Bright Kerosene	National Oil Co.	W. L. Bell	Beaufort	90	.805	
156	Aladdin	Standard Oil Co.	J. H. Boyte	Monroe	89	.805	
157	----do	----do	H. C. Watson	Rockingham	92	.80	
158	----do	----do	Parsons Drug Co.	Wadesboro	92	.80	

159	Red "C"	Red "C" Oil Mfg. Co.	J. L. Michael	Lexington	110	.78
160	Diamond White	Standard Oil Co.	Lexington Grocery Co.	----do	86	.805
161	----do	----do	W. H. Chappelle	Thomasville	89	----
162	----do	----do	J. E. Ingram	Ashboro	89	----
163	Sunbeam	Red "C" Oil Mfg. Co.	W. B. Johnson	Fayetteville	98	.81
164	Aladdin	Standard Oil Co.	Standard Oil Co.	Maxton	102	.79
165	Diamond White	----do	----do	Lumberton	94	.805
166	Water-white	Gulf Refining Co.	Cape Fear Oil Co.	Wilmington	116	.805
167	----	Standard Oil Co.	Pembroke Mercantile Co.	Pembroke	91	.81
168	Aladdin	----do	Standard Oil Co.	Chadbourn	102	.80
169	Diamond White	----do	J. Flem. Johnson	Gastonia	93	----
170	Aladdin	----do	J. J. Lattimer	Shelby	102	.80
171	White "C"	Red "C" Oil Mfg. Co.	Piedmont Grain and Provision Co.	Hickory	112	.78
172	Red "C"	----do	----do	----do	110	785
173	Sunbeam	----do	----do	----do	90	.81
174	Red Radium	North Carolina Oil Co.	J. A. Bleak & Sons	Morganton	111	.80
175	Aladdin	Standard Oil Co.	S. L. Whitiner	Hickory	100	.80
176	----do	----do	W. G. Rettick	Youngsville	81	.80
177	----do	----do	J. Caudell	Oxford	107	.805
178	----do	----do	J. N. Mason	Durham	100	.805
179	White "C"	Red "C" Oil Mfg. Co.	Southern Pure Food Grocery Co.	----do	106	.79
180	Sunbeam	----do	City Transfer Co.	Greensboro	110	.815
181	Red "C"	----do	----do	----do	114	.79
182	Aladdin	Standard Oil Co.	Standard Oil Co.	----do	92	----
183	Diamond White	----do	T. F. Magnum	----do	88	----
184	Aladdin	----do	J. G. Pritchett	Burlington	103	.795

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
185	Aladdin	Standard Oil Co.	J. H. Caldwell	Winston-Salem	106	.81	
186	Soline	Indian Refining Co.	H. C. Eaton	---do	105	79	
187		Red "C" Oil Mfg. Co.			110	78	Sent by J. T. Stallings, R. F. D. 3, Clayton, N. C.
188	Aladdin	Standard Oil Co.	J. L. Roper	Oriental	107	.79	
189	Columbia	Red "C" Oil Mfg. Co.	M. B. Humphrey	Jacksonville	109	815	
190	Aladdin	Standard Oil Co.	E. M. Petoway	---do	93	.805	
191	Red Soline Lamp	Red "C" Oil Mfg. Co.	Collins & Gillett	Mayesville	110	.785	
192	Fire Test Soline	Crown Oil and Wax Co	---do	---do	110	.785	
193	Pratt's Astral	Standard Oil Co.	Pelliston & Weeks	---do	105	.81	
194	Soline Lamp Oil	Crown Oil and Wax Co.	T. A. Bell	Pollocksville	124	.79	
195	Aladdin	Standard Oil Co.	R. C. Mansfield	Edenton	89	.805	
196	Water-white	Red "C" Oil Mfg. Co.	T. K. Rea	---do			
197	Perfection	National Oil Co.	C. N. Stevens Co.	Elizabeth City	110	.815	
198	Aladdin	Standard Oil Co.	Sawyer Grocery Co.	Belhaven	107	.79	
199	---do	---do	H. A. White		104	.80	
200	---do	---do	A. S. Moore	Plymouth	102	.80	
201	---do	---do	E. H. Moore	Washington	116	81	
202	---do	---do	C. H. Wiggins	Raleigh	103	.80	
203	---do	---do	H. V. Daniel	Durham	104	805	
204	---do	---do	---do	---do	115	.81	

205	----do----	----do----	----do----		115	.81	
206	----do----	----do----	----do----		115	.81	
207	----do----	----do----	N. A. Pittman		102	.80	
208	----do----	----do----	H. D. Allen	Weldon	93	.805	
209	----do----	----do----	----do----	----do----	107	.81	
210	Red "C"	Red "C" Oil Mfg. Co.	W. H. Riggs	Warrenton	112	.785	
211	Garnet Red	----do----	W. H. Brock	Kinston	116	.805	
212	Aurora White	----do----	----do----	----do----	112	.815	
213	Diamond White	Standard Oil Co.	T. W. Hirsh	Tarboro	83	.805	
214	Aladdin Security	----do----	----do----	----do----	102	.805	
215	Fire-proof	----do----	Standard Oil Co.	Johnson City, Tenn.	110	.807	
216	Headlight	----do----	----do----	----do----	110	.815	Burned and distilled uniformly.
217	Aladdin	----do----	T. J. Ray	Elk Park	108	.81	Weight not objectionable.
218	Aladdin Security	----do----	S. L. Whitiner	Hickory	106	.805	
219	Aladdin	----do----	J. M. Patton	Morganton	93	.805	
220	----do----	----do----	----do----	----do----	91	.80	
221	----do----	----do----	C. C. Beasley	Charlotte	98	.807	
222	Diamond White	----do----	----do----	----do----	103		
223	Aladdin Security	----do----	H. A. White	Parmele	106	.805	
224	----do----	----do----	Standard Oil Co.	Williamston	106	.805	
225	----do----	----do----	Norwood Savoy	Scotland Neck	100	.80	
226	Aladdin	----do----	Standard Oil Co.	Aulander	94	.805	
227	Aladdin Security	----do----	H. T. Marcan	Warrenton	106	.80	
228	----do----	----do----	A. W. Green	Littleton	103	.805	
229	Pratt's Astral	----do----	----do----	----do----	110	.782	
230	Aladdin	----do----	C. H. Wiggins	Raleigh	103	.805	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks
231	Aladdin Security	Standard Oil Co.	W. T. Joyner	Franklinton	118	.81	
232	----do	----do	W. C. Brewer Co.	Wake Forest	114	.81	
233	White "C"	Red "C" Oil Mfg. Co.	----do	----do	110	.787	
234	Aladdin Security	Standard Oil Co.	A. W. Person	Louisburg	112	.805	
235	Aladdin	----do	J. Caudell	Oxford	106	.805	
236	Aladdin Security	----do	----do	Henderson	108	.805	
237	Aladdin	----do	C. C. Beasley	Charlotte	97	.805	
238	----do	----do	J. J. Lattimore	Shelby	103	.805	
239	Diamond White	----do	O. A. Costner	Lincolnton	98	.807	
240	----do	----do	J. Flem. Johnson	Mt. Holly	100	.805	
241	----do	----do	----do	Kings Mountain	102	.805	
242	----do	----do	----do	Gastonia	102	.805	
243	----do	----do	----do	----do	102	.805	
244	Aladdin	----do	C. W. Hanks	Pittsboro	96	.80	
245	Diamond White	----do	C. H. Wiggins	Raleigh	110	.81	
246	Aladdin	----do	Standard Oil Co.	Dunn	102	.80	
247	White Superba	National Oil Co.	Moore Supply House	Raeford	108	.80	
248	Aladdin	Standard Oil Co.	Standard Oil Co.	Fayetteville	102	.80	
249	----do	----do	----do	Lumberton	102	.802	
250	Aurora	Red "C" Oil Mfg. Co.	W. B. Johnson	Fayetteville	109	.815	

251	----do	----do	----do	----do	109	-------
252	Carnadine	Standard Oil Co.	Holister & Cox	New Bern	110	.80
253	Aladdin	----do	----do	----do	102	.80
254	North Carolina Test White	National Oil Co.	New Bern Fruit Co.	----do	109	.82
255	Diamond White	Standard Oil Co.	H. E. Gurley	Goldsboro	105	.80
256	Red Illuminating	----do	----do	----do	106	.80
257	Diamond White	----do	J. W. Tucker	Warsaw	101	.805
258	Aladdin	----do	O. C. Willis	Morehead	103	.80
259	--- do	----do	W. T. Dill	Beaufort	103	-------
260	----do	----do	W. W. Drake	Mount Airy	102	.805
261	----do	----do	J. W. Mason	Hillsboro	113	.805
262	Crystal White	Richmond Oil Co.	W. T. Ware	Reidsville	103	.815
263	----do	Indian Refining Co.	G. I. Eaton	Winston-Salem	112	.81
264	Soline	Freedom Oil Co.	----do	----do	104	.785
265	North Carolina Test	Standard Oil Co.	W. S. Chappelle	High Point	101	.805
266	Crystal Headlight	Indian Refining Co.	V. J. Dasker	----do	106	.79
267	Aladdin	Standard Oil Co.	J. R. Caffey	Wilkesboro	104	.795
268	Diamond White	----do	J. P. Phifer	Statesville	103	.80
269	White "C"	Red "C" Oil Mfg. Co.	Overman & Co.	Salisbury	106	.785
270	Diamond White	Standard Oil Co.	S. H. Milton	Albemarle	87	.805
271	Aladdin	----do	----do	----do	105	.805
272	Diamond White	----do	D. K. McNeeley	Mooresville	104	.80
273	Aladdin	----do	Harrison & Co.	Lenoir	102	.80
274	----do	----do	W. R. Sloop	Asheville	93	.805
275	Soline	North Carolina Oil Co.	H. A. Wild	----do	107	.795
276	Aladdin	Standard Oil Co.	R. H. Mitchell	Waynesville	100	.805

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
277	Pratt's Astral	Standard Oil Co.	S. Y. Bryson	Hendersonville	110	.785	
278	Aladdin	do	do	do	96	.80	
279	do	do	E. Y. Grosner	Marion	100		
280	Extra Soline	North Carolina Oil Co.	H. A. Wild	Asheville	103	.785	
281	Diamond White	Standard Oil Co.	R. B. Crutchfield	Wilson	106	.815	
282	Aladdin	do	Chas. Jones	Spring Hope	87	.80	
283	Aladdin Security	do	L. Turner	Kinston	100	.80	
284	White	National Oil Co.	W. H. Brick	do	115	813	
285	Aladdin Security	Standard Oil Co.	L. Turner	do	102	80	
286	do	do	R. B. Crutchfield	Wilson	106	.81	
287	Diamond White	do	Edward Jordan	Siler City	89	.805	
288	Aurora Water-white	Red "C" Oil Mfg. Co.	Southern Pure Food Grocery Co.	Durham	112	.815	
289	Aladdin	Standard Oil Co.	J. N. Mason	Chapel Hill	103	.80	
290	do	do	Edward Jordan	Siler City	110	.815	
291	do	do	A. W. Person	Louisburg	106	805	
292	White "C"	Red "C" Oil Mfg. Co.	E. J. Chatham	Franklinton	114	785	
293	Red "C"	do	do	do	114	.785	
294	Aladdin	Standard Oil Co.	Holister & Cox	New Bern	106	803	
295	Diamond White	do	do	do	102	.80	
296	Aurora Water-white	Red "C" Oil Mfg. Co.	L. C. Tolson	do	114	.815	

297	Aurora Red	----do	----do	----do	108	.81	
298	North Carolina Test White	National Oil Co.	New Bern Fruit Co.	----do	108	.815	
299	Red Star Warranted High Test	----do	----do	----do	108	.81	
300	Diamond White	Standard Oil Co.	C. C. Beasley	Charlotte	102	.805	
301	----do	----do	Thos. Frisbee	Hot Springs	102	80	
302	Aladdin Security	----do	----do	----do	108	.80	
303	White "C"	Red "C" Oil Mfg. Co.	Piedmont Grain and Provision Co.	Hickory	107	.785	
304	Red "C"	----do	----do	----do	110	.785	
305	Aurora	----do	----do	----do	112	.815	
306	Aladdin Security	Standard Oil Co.	J. M. Patton	Morganton	108	.805	
307	Aurora	Red "C" Oil Mfg. Co.	W. R. Pleasant	Greensboro	112	.82	Very heavy oil. Stood all tests well.
308	Aladdin	Standard Oil Co.	J. G. Pritchett	Burlington	112	.81	
309	----do	----do	T. F. Mangum	Greensboro	107	.805	
310	----do	----do	C. R. Barley	Leaksville	108	.805	
311	----do	----do	J. H. Leadwell	Winston-Salem	108	.805	
312	Diamond White Headlight	----do	J. H. Caldwell	----do	108	.815	
313	----do	----do	T. F. Mangum	----do	108	81	
314	Aladdin	----do	Standard Oil Co.	Chadbourn	102	.80	
315	Diamond White	----do	----do	Maxton	102	.805	
316	Water-white	Gulf Refining Co.	Cape Fear Oil Co.	Wilmington	114	.80	
317	Diamond White	Standard Oil Co.	Standard Oil Co.	----do	102	.80	
318	Aladdin	----do	----do	----do	100	.80	
319	----do	----do	----do	Red Springs	112	.805	
320	----do	----do	----do	----do	100	805	
321	----do	----do	R. G. Ferrell	Aberdeen	92	.805	
322	----do	----do	J. L. Gilmore	Sanford	100	.80	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
323	Aladdin	Standard Oil Co.	W. D. Wright	Laurinburg	102	.80	
324	do	do	Parsons Drug Co.	Wadesboro	100	.80	
325	do	do	Nana & Tomlinson	Troy	100	.805	
326	Diamond White	do	J. E. Ingram	Ashboro	110	.815	
327	Aladdin	do	W. J. Owenby	Murphy	100	.80	
328	Water-white	Chas. H. Moore Oil Co.	S. A. Munday	Franklin	110	.81	
329	Red "C"	Red "C" Oil Mfg. Co.	J. F. Moore	do	112	.785	
330	Aladdin	Standard Oil Co.	W. R. Sloop	Asheville	109	.805	
331	Diamond White	do	do	do	115	.805	
332	do	do	do	do	111	.805	
333	Aladdin	do	E. L. McKee	Sylva	102	.80	
334	do	do	C. H. Wiggins	Raleigh	101	.80	
335	do	do	J. N. Mason	Durham	108	.80	
336	Diamond White	do	J. Caudell	Henderson	108	.807	
337	Electric Safety	Richmond Oil Co.	H. M. Church	Middleburg	109	.81	Burning, distillation, sulphur, water and mineral salt tests.
338	White	National Oil Co.	Southern Grocery Co.	Henderson	108	.818	
339	Aladdin	Standard Oil Co.	J. Caudell	do	106	.81	
340	do	do	J. N. Mason	Durham	106	.81	
341	do	do	J. Caudell	Oxford	106	.81	

342	Water-white North Carolina Test.	do	Thos. Goodwillie	Baltimore, Md.	106	.805	From Standard Oil Co., Baltimore.
343	Aladdin	do	C. H. Wiggins	Raleigh	104	.807	
344	Diamond White Headlight	do	W. W. Lowry	Mount Airy	106	.81	
345	Aladdin	do	J. H. Caldwell	Rural Hall	86	.80	
346	Diamond White Headlight	do	T. F. Mangum	Greensboro	90	.805	
347	Diamond White	do	T. D. Mender	Madison	100	.805	
348	do	do	J. H. Walker & Co.	Reidsville	98	.805	
349	Red "C"	Red "C" Oil Mfg. Co.	City Transfer Co.	Greensboro	112	.785	
350	Diamond White	Standard Oil Co.	J. H. Caldwell	Rural Hall	117	.805	
351	Aurora Red	Red "C" Oil Mfg. Co.	R. J. Rivenbark	Goldsboro	106	.815	
352	Aurora Water-white	do	do	do	108	.815	
353	White "C"	do	do	do	113	.785	
354	Diamond White	Standard Oil Co.	H. E. Gurley	do	110	.81	
355	North Carolina Test White	National Oil Co.	New Bern Fruit Co.	New Bern	108	.815	
356	Diamond White	Standard Oil Co.	C. C. Beasley	Charlotte	112	.805	
357	Aladdin Security	do	do	do	100	.80	
358	Diamond White	do	do	do	104	.805	
359	Aladdin Security	do	O. A. Costner	Lincolnton	102	.80	
360	Diamond White	do	do	do	100	.805	
361	Aladdin Security	do	T. J. Ray	Elk Park	102	.805	
362	do	do	C. C. Beasley	Charlotte	102	.80	
363	Aladdin	do	N. G. Grandy & Co.	Elizabeth City	106	.805	
364	do	do	R. C. Mansfield	Edenton	106	.805	
365	do	do	N. G. Grandy & Co.	Elizabeth City	104	.805	
366	do	do	H. A. White	Greenville	106	.805	
367	Aurora	Red "C" Oil Mfg. Co	C. G. Morris & Co.	Washington	92	.815	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
368	Aladdin	Standard Oil Co.	E. H. Moore	Washington	106	.805	
369	Diamond White	do	C. C. Beasley	Charlotte	100	80	
370	do	do	do	do	100	.803	
371	Aladdin Security	do	J. J. Lattimore	Shelby	100	80	
372	Diamond White	do	J. Flem. Johnson	Gastonia	102		One sample only.
373	do	do	do	do	102		One sample only.
374	White "C"	Red "C" Oil Mfg. Co.	Piedmont Grain and Provision Co	Hickory	108	785	
375	Red "C"	do	do	do	112	785	
376	Aladdin Security	Standard Oil Co.	C. C. Beasley	Charlotte	100	80	
377	Aladdin North Carolina Test	do	J. R. Caffey	No. Wilkesboro	100	80	
378	Diamond White	do	C. C. Emerson	Salisbury	106	.805	
379	do	do	S. H. Milton	Albemarle	108	.805	
380	Aladdin	do	J. P. Phifer	Statesville	107	.805	
381	Diamond White	do	C. C. Emerson	Salisbury	107	.81	
382	Aladdin	do	A. B. Pound	Concord	102	80	
383	Red "C"	Red "C" Oil Mfg. Co.	Overman & Co.	Salisbury	112	.785	
384	Prime White	Standard Oil Co.	Standard Oil Co.	Wilmington	102	.805	
385	Aladdin	do	do	do	100	.80	
386	do	do	do	Chadbourn	102	.80	
387	Water-white	Cape Fear Oil Co.	Cape Fear Oil Co.	Wilmington	116	.80	

388	Prime White	Standard Oil Co.	Standard Oil Co.	Fayetteville	100	.805	
389	Aladdin	....do	....do	Dunn	100	.80	
390	Aurora White	Red "C" Oil Mfg. Co.	Red "C" Oil Mfg. Co.	Fayetteville	110	.815	
391	Aladdin	Standard Oil Co.	J. N. Mason	Durham	107	805	
392	....do	....do	J. Caudell	Henderson	106	.805	
393	....do	....do	N. A. Pittman	Selma	100	.805	
394	Aladdin Security	....do	Chas. Jones	Rocky Mount	104	.803	
395	....do	....do	T. W. Thrash	Tarboro	104	803	
396	....do	....do	J. N. Savage	Scotland Neck	107	803	
397	....do	....do	W. H. Allen	Weldon	109	802	
398	....do	....do	A. W. Green	Littleton	109	.803	
399	Diamond White	....do	L. Turner	Kinston	101	803	
400	Red Oil	National Oil Co.	J. B. Nichols & Bro.	Windsor	109	815	
401	Aladdin	Standard Oil Co.	W. F. Joyner	Franklinton	110	.808	
402	Aurora White	Red "C" Oil Mfg. Co.	Pure Food Grocery Co.	Durham	109	.81	
403	Red "C"	....do	....do	....do	109	.785	
404	Aladdin	Standard Oil Co.	S. Y. Bryson	Hendersonville	98		One sample only.
405	....do	....do	W. F. Byers	Rutherfordton	100	.80	
406	Radium	North Carolina Oil Co.	H. A. Wild	Asheville	116	.81	
407	Crystal	Petroleum Oil Co.	R. H. Blackburn	Tryon	118	.80	
408	Aladdin	Standard Oil Co.	W. F. Byers	Caroleen	100	.80	
409	....do	....do	Jno. S. Trotter	Franklin	108		One sample only.
410	....do	....do	W. G. Owenby	Murphy	100	.80	
411	....do	....do	R. H. Mitchell	Waynesville	102	.80	
412	....do	....do	C. W. Harris	Pittsboro	100	.804	
413	....do	....do	J. N. Mason	Durham	110	808	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
414	Aurora White	Red "C" Oil Mfg. Co.	R. J. Rivenbark	Goldsboro	110	.815	
415	White "C"	do	do	do	112	.805	
416	Red "C"	do	do	do	112	.805	
417	Aurora Red	do	do	do	100	.80	
418	North Carolina Test White	National Oil Co.	New Bern Fruit Co.	New Bern	110	.82	
419	White "C"	Red "C" Oil Mfg. Co.	Jas. R. Bell	Morehead City	112	.785	
420	White Star	National Oil Co.	W. L. Bell	Beaufort	113	.813	
421	Aladdin Security	Standard Oil Co.	The Atkinson Co.	Elkin	109	.805	
422	Aladdin	do	J. G. Pritchett	Burlington	108	.805	
423	Prime White	Indian Refining Co.	G. I. Eaton	Winston-Salem	109	.815	
424	Aladdin	Standard Oil Co.	J. H. Caldwell	do	109	.805	
425	Crystal White	Richmond Oil Co.	W. D. Ware	Reidsville	109	.813	
426	White "C"	Red "C" Oil Mfg. Co.	W. R. Pleasant	Greensboro	110	.785	
427	Diamond White	Standard Oil Co.	M. E. Williams	Miller	108	.813	
428	Aladdin Security	do	Chas. Jones	Rocky Mount	104	.802	
429	do	do	R. B. Crutchfield	Wilson	102	.805	
430	Aurora Water-white	Red "C" Oil Mfg. Co.	I. S. Forte	do	107	.815	
431	White "C"	do	do	do	112	.785	
432	Carnadine	Standard Oil Co.	J. J. Jones	Nashville	100	.803	
433	Aladdin	do	H. B. B. Victor	do	104	.80	

434			C. B. Kirsh & Co.	Tarboro	104	.805	
435	North Carolina Test	National Oil Co.	N. G. Barbee & Son	Clayton	100	.815	
436	Red "C"	Red "C" Oil Mfg. Co.	----do	----do	108	.785	
437	Diamond White	Standard Oil Co.	Standard Oil Co.	Maxton	102	.80	
438	Aladdin	----do	----do	Garland	104	.805	
439	----do	----do	----do	Dunn	102	.80	
440	Water-white 150°	Gulf Refining Co.	Cape Fear Oil Co.	Wilmington	118	.80	
441	Aladdin	Standard Oil Co.	Standard Oil Co.	Lumberton	100	.805	
442	----do	----do	Lillington Supply Co.	Lillington	102	.80	
443	----do	----do	Parsons Drug Store	Wadesboro	102	.80	
444	----do	----do	Standard Oil Co.	Mocksville	100	.805	
445	----do	----do	Lexington Grocery Co.	Lexington	102	.815	
446	----do	----do	H. C. Watson	Rockingham	102	.805	
447	Radium	Gulf Refining Co.	Blalock Hardware Co.	Wadesboro	120	.80	
448	Diamond White	Standard Oil Co.	J. E. Ingram	Randleman	106	.81	
449	Aladdin	----do	J. L. Gilmore	Sanford	101	.80	
450		Cape Fear Oil Co.			102	.802	Samples sent by Cape Fear Oil Co.
451		----do			102	.802	
452	Aurora Water-white	Red "C" Oil Mfg. Co.	L. C. Tolson	New Bern	112	.815	
453	Aurora Red	----do	----do	----do	109	.81	
454	North Carolina Test White	National Oil Co.	New Bern Fruit Co.	----do	108	.815	
455	Aurora Water-white	Red "C" Oil Mfg. Co.	M. B. Humphrey	Jacksonville	112	.815	
456	Red Soline	Crown Oil and Wax Co.	Warren Bros. & Butt	Vanceboro	120	.785	
457	Aladdin	Standard Oil Co.	Woodson Thomas	Roxboro	104	.805	
458	----do	----do	N. A. Pittman	Selma	100	.805	
459	----do	----do	J. N. Mason	Durham	104	.805	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
460	Aladdin	Standard Oil Co.	C. H. Wiggins	Raleigh	100	80	
461	White "C"	Red "C" Oil Mfg. Co.	Smithfield Hardware Co.	Smithfield	108	.785	
462	Aladdin	Standard Oil Co.	C. H. Wiggins	Raleigh	104	.805	
463	Aladdin	Standard Oil Co.	Buck Harris	Roseboro	96		Only one sample.
464	Water-white		J. J. Lipscomb	Mollie	112	80	
465	Soline	Freedom Oil Co.	V. J. Dosken	High Point	104	.785	
466	Crystal Headlight	Central Refining Co.	do	do	112	.805	
467	Soline	Freedom Oil Co.	G. I. Eaton	Winston-Salem	106	.785	
468	Aladdin	Standard Oil Co.	J. G. Pritchett	Burlington	104	.805	
469	do	do	C. R. Bailey	Leaksville	104	.805	
470	Diamond White	do	T. F. Mangum	Greensboro	106	.81	
471	do	do	J. Flem. Johnson	Mount Holly	102	.805	
472	do	do	do	Kings Mountain	102	.805	
473	Aladdin Security	do	S. L. Whitiner	Hickory	102	.80	
474	do	do	W. E. Griffith	Boonford	102	.80	
475	Diamond Headlight	do	Standard, Johnson, Tenn.	Toe Cane	116	.81	
476	Fireproof	do	do	do	112	.805	
477	Diamond White	do	C. C. Beasley	Charlotte	104	.805	
478	Aladdin	do	E. H. Moore	Washington	108	.802	
479	do	do	H. A. White	Greenville	105	.802	

480	Aurora	Red "C" Oil Mfg. Co.	J. K. Rea	Edenton	112	.81	
481	White "C"	----do	J. R. Jackson	Hertford	112	.785	
482	Elbro	National Oil Co.	Ellison Bros.	Washington	109	.815	
483	Aladdin	Standard Oil Co.	Sawyer Grocery Co.	Belhaven	104	.805	
484	----do	----do	N. A. Grandy & Co.	Elizabeth City	104	.805	
485	Superba	National Oil Co.	Southern Grocery Co.	Henderson	106	.785	
486	Aladdin	Standard Oil Co.	C. H. Wiggins	Wake Forest	104	.805	
487	----do	----do	J. Caudell	Henderson	104	.805	
488	----do	----do	J. N. Mason	Durham	103	.805	
489	Diamond White	----do	T. F. Mangum	Greensboro	107	.81	
490	----do	----do	J. H. Caldwell	Winston-Salem	107	.81	
491	Aladdin	----do	----do	----do	102	.815	
492	----do	----do	W. W. Lowery	Mount Airy	106	.805	
493	Diamond White	----do	J. H. Watkins	Reidsville	109	.81	
494	Red "C"	Red "C" Oil Mfg. Co.	W. R. Pleasant	Greensboro	108	.785	
495	Diamond White	Standard Oil Co.	T. F. Mangum	----do	110	.815	
496	Aladdin	----do	E. L. McKee	Sylva	102	.805	
497	----do	----do	S. Y. Bryson	Hendersonville	100	.805	
498	Soline	North Carolina Oil Co.	H. A. Wild	Asheville	120	.785	
499	Aladdin	Standard Oil Co.	W. R. Sloop	----do	100	.80	
500	----do	----do	----do	----do	100	80	
501	Radium	Indian Refining Co.	H. A. Wild	----do	112	.81	
502	Aladdin	Standard Oil Co.	W. R. Sloop	----do	102	.805	
503	Diamond White North Carolina Test.	----do			101	.805	Sample sent from Standard Oil Co., Wilmington.
504	Aladdin North Carolina Test	----do			101	805	Sample sent from Standard Oil Co., Wilmington.

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
505	Aurora White	Red "C" Oil Mfg. Co.	W. B. Johnson	Fayetteville	108	.81	
506	Water-white, 150°	Gulf Refining Co.	Cape Fear Oil Co.	Wilmington	120	.80	
507	Aladdin	Standard Oil Co.	Standard Oil Co.	Red Springs	104	.80	
508	----do	----do	E. L. Henry	Elwell's Landing	100	.80	
509	Diamond White	----do	W. C. Page	Rhone Landing	102	.805	
510	Aladdin	----do	Harrison & Co.	Lenoir	100	.80	
511	----do	----do	J. R. Caffey	No. Wilkesboro	100	.80	
512	White "C"	Red "C" Oil Mfg. Co.	Overman & Co.	Salisbury	112	.785	
513	Aladdin	Standard Oil Co.	A. B. Pound	Concord	100	.80	
514	----do	----do	----do	----do	100	.80	
515	Red "C"	Red "C" Oil Mfg. Co.	Overman & Co.	Salisbury	109	.785	
516	----do	----do	M. Freeman & Co.	Norwood	112	.785	
517	Diamond White	Standard Oil Co.	Holister & Cox	New Bern	127	.80	
518	Aladdin	----do	----do	----do	106	.805	
519	White Star	National Oil Co.	New Bern Fruit Co.	----do	108	.815	
520	Aladdin	Standard Oil Co.	Holister & Cox	----do	100	.805	
521	Soline Red	Crown Oil and Wax Co.	Collins & Gillett	Maysville	112	.79	
522	Fire Test Soline	----do	----do	----do	112	.79	
523	Aladdin	Standard Oil Co.	J. Caudell	Oxford	102	.805	
524	----do	----do	J. N. Mason	Durham	104	.805	

525	Pratt's Astral	---do	D. McCaulay	Chapel Hill	100	.805	
526	Aladdin	---do	J. N. Mason	---do	100	.805	
527	---do	---do	C. H. Wiggins	Raleigh	100	.805	
528	Aladdin Security	---do	H. T. Macon	Warrenton	108		Only one sample.
529	---do	---do	Chas. Jones	Rocky Mount	102	.805	
530	---do	---do	J. M. Brooks	Parmele	108	.805	
531	---do	---do	T. W. Thrash	Tarboro	104	.805	
532	---do	---do	H. D. Allen	Weldon	103		Only one sample.
533	---do	---do	A. W. Green	Littleton	110	.805	
534	---do	---do	J. N. Savage	Scotland Neck	100	.805	
535	---do	---do	R. B. Crutchfield	Wilson	100	.80	
536	Red "C"	Red "C" Oil Mfg. Co.	R. J. Rivenbark	Goldsboro	108	.79	
537	Aurora Red	---do	---do	---do	102	.805	
538	Aurora White	---do	---do	---do	106	.815	
539	North Carolina Test White	National Oil Co.	New Bern Fruit Co.	New Bern	106	.815	
540	White Star	---do	---do	---do	106	.815	
541	Diamond White	Standard Oil Co.	R. L. Hayes & Co.	Middlesex	108	.81	
542	Aladdin	---do	J. N. Mason	Durham	102	.805	
543	---do	---do	A. S. Moore	Plymouth	104	.805	
544	---do	---do	N. G. Grandy & Co.	Elizabeth City	104	.805	
545	---do	---do	A. S. Moore	Columbia	104	.805	
546	---do	---do	L. D. Tarlington	Manteo	104	.805	
547	---do	---do	H. A. White	Greenville	104	.805	
548	---do	---do	E. H. Moore	Washington	104	.805	
549	White	National Oil Co.	Southern Grocery Co.	Henderson	108	.82	
550	Red "C"	Red "C" Oil Mfg. Co.	Geo. Rose & Co.	---do	106	.785	

RESULTS OF THE EXAMINATION OF OILS.—CONTINUED.

Laboratory Number.	Name of Oil.	Made by—	Sold by—	Where Sold.	Flash—Degrees Fahrenheit.	Specific Gravity.	Remarks.
551	Electric Safety	Richmond Oil Co.		Middleburg	110	.815	
552	Aladdin	Standard Oil Co.	C. H. Wiggins	Raleigh	102	.80	
553	Diamond White	....do	C. C. Beasley	Charlotte	102	.805	
554	Aladdin Security	....do	T. J. Ray	Elk Park	110	.805	
555	Diamond White	....do	C. C. Beasley	Charlotte	102	.81	
556	Aurora	Red "C" Oil Mfg. Co.	Piedmont Grain and Provision Co.	Hickory	110	.805	
557	Red "C"	....do	....do	....do	111	.785	
558	Diamond White	Standard Oil Co.	C. C. Beasley	Charlotte	101	.807	
559	Aladdin Security	....do	S. L. Whitiner	Hickory	102	.80	
560	Aurora	Red "C" Oil Mfg. Co.	W. B. Johnson	Fayetteville	108	.81	
561	Diamond White	Standard Oil Co.	Standard Oil Co.	....do	100	.80	
562	Aladdin	....do	....do	Maxton	100	.80	
563	....do	....do	....do	Dunn	100	.80	
564	....do	....do	C. R. Bailey	Leaksville	106	.805	
565	....do	....do	J. G. Pritchett	Burlington	106	.805	
566	....do	....do	T. F. Mangum	Greensboro	102	.805	
567	Diamond White	....do	W. S. Chappelle	High Point	108	81	
568	....do	....do	W. W. Long	Mount Airy	108	81	
569	Prime White	Freedom Oil Co.	J. G. Fuller	Walnut Cove	104	.795	
570	Aladdin	Standard Oil Co.	J. H. Caldwell	Winston-Salem	100	.805	

571	----do----------	----do----------	W. F. Dill----------	Beaufort----------	102	.805	
572	White "C"----------	Red "C" Oil Mfg. Co.----	A. Thomas----------	----do----------	108	.785	
573	Sunbeam Security----------	----do----------	----do----------	----do----------	87	.795	Condemned and sale stopped.

LEAF TOBACCO SALES FOR DECEMBER, 1909.

Pounds sold for producers, first hand	15,432,142
Pounds sold for dealers	429,146
Pounds resold for warehouses	1,088,061
Total	16,949,349

SUPPLEMENT TO JANUARY BULLETIN, 1910.

North Carolina Department of Agriculture.

SPECIAL BULLETIN.

WINTER AND SPRING

WORK IN SELECTING SEED CORN.

BY

W. A. GRAHAM,

COMMISSIONER.

PUBLISHED AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Melville	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Field Crops.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
E. P. Wood	Assistant Veterinarian.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
W. H. Eaton	Assistant Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

ALLIED PRINTING TRADES UNION LABEL COUNCIL RALEIGH, N. C.

E. M. UZZELL & CO., PRINTERS, RALEIGH

WINTER AND SPRING WORK IN SELECTING SEED CORN.

The cotton crop of North Carolina is estimated to sell on an average each year for from thirty-five to forty million dollars. This amount of money is annually sent from the State to purchase supplies which could be more profitably produced by the farmers than they can be purchased. Much of these supplies, *i. e.*, hay, corn and other grains, flour, meal, meat, lard, canned vegetables, and fruits, beans, peas, etc., etc., are bought by farmers. In amount the only portion of the money which the farmer receives for his cotton crop that remains in the State is the profit the merchant, who sells these goods to farmers and others, receives on the business.

In consultation with the Commissioners of Agriculture and others acquainted with such matters, I have been informed that it is probable that in every Southern State except Texas the same condition prevails. This evil must be corrected or the South will not make the material progress that it should, and it is doubtful if Southern farming can make any financial advance with such a wasteful practice. The North Carolina Agricultural Department desires to call the earnest attention of the farmers to this matter and to persuade them to change the condition of affairs by producing these articles for which there is a home market, if not an actual home demand.

A supply of corn for the maintenance of the farm is acknowledged by all persons of observation to be a necessity to successful farming.

No part of corn farming is more important than the selection of the seed. Last July a Bulletin was issued by this Department relating to the work that should be done in July and August, *i. e.*, when the corn is growing and before it matures. It was intended to follow this Bulletin, in October, with one relating to selection of seed at gathering time, but it was not found convenient to get the Bulletin out at that time. However, many farmers, no doubt, gave some attention to the matter. The selection of seed from the crib or bin and the more careful examination of that already chosen can now have attention.

Fig. 1 gives a picture of the styles of ear that should be chosen. An ear that carries the same number of rows on all parts of the cob, and that has the rows of grain running straight and not broken, as shown in Fig. 2. Fig. 2 is a picture of undesirable types.

The grain should be sound; for the best ear is the one that will give in weight the largest proportion of sound corn when it is shelled.

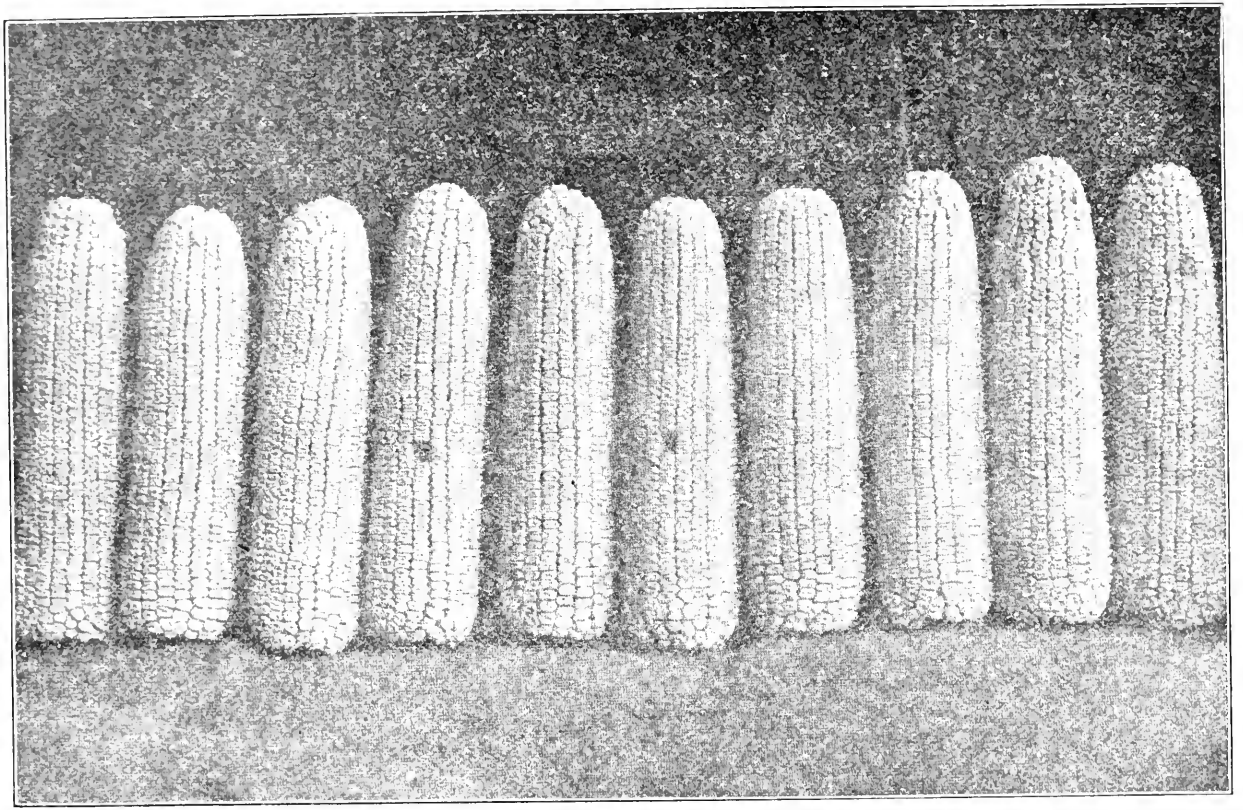


FIG. 1—A GOOD CORN EXHIBIT.

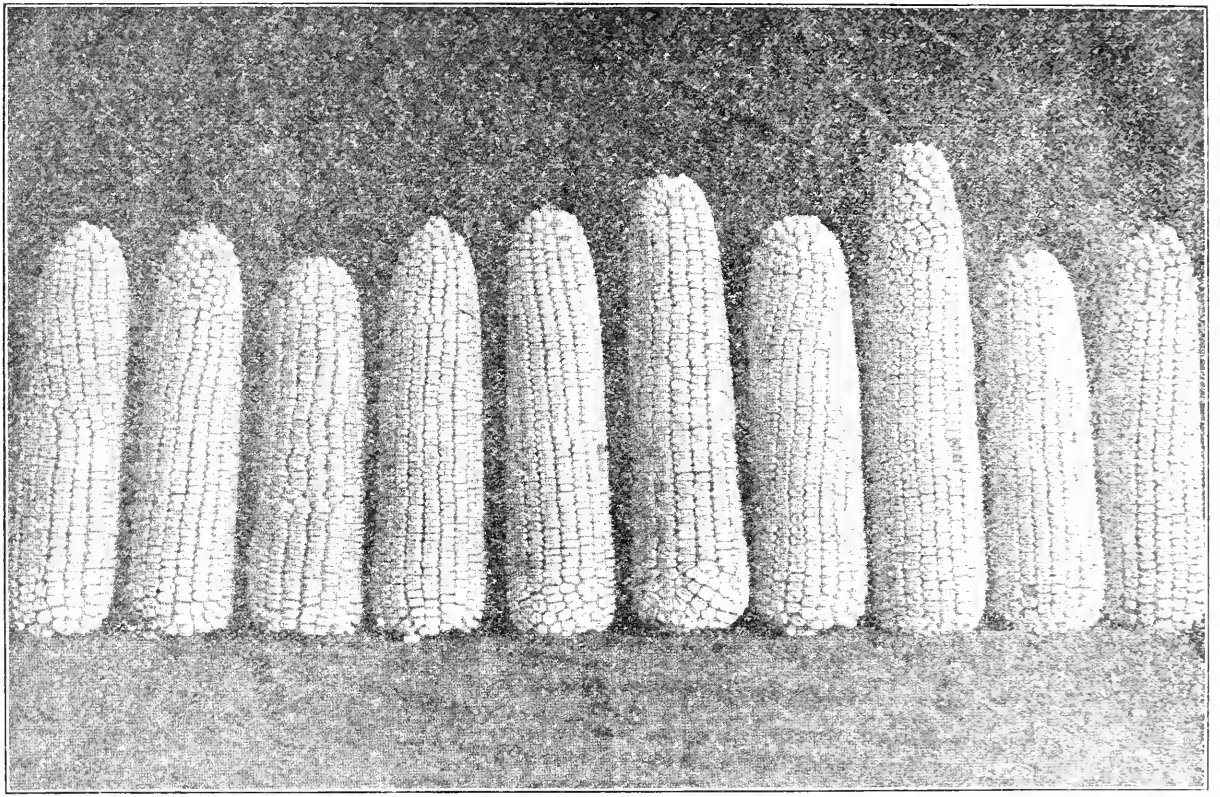


FIG. 2—A POOR CORN EXHIBIT.

After you have selected the ear as a type which you desire, then take some grains from different parts and split them open to see that the grain is of proper composition and condition. Fig. 3 gives a picture of the component parts of a grain of corn.

MECHANICAL EXAMINATION OF A KERNEL OR GRAIN OF CORN.

It consists of 9 parts, as shown in Fig. 3.

1. *Tip cap,* which covers the tip or base of the kernel and comprises only about 1.5 per cent of the grain.
2. *Embryo root.*
3. *Tip starch.*
4. *Germ.* The germ occupies the central part of the kernel toward the tip end. It comprises about 11 per cent of the kernel (more in high-oil corn and less in low-oil corn). The germ contains from 35 to 40 per cent of corn oil or from 80 to 85 per cent of the total oil content of the corn kernel.
5. *Embryo stem or stalk.*
6. *Horny gluten.* The horny glutenous part (aleurone layer) lies underneath the hull surrounding the kernel. It comprises from 8 to 14 per cent of the grain (being more abundant in high protein corn), and it contains from 20 to 25 per cent of protein, being the richest in protein of all the parts of the corn kernel.
7. *Horny starch.* The horny starchy part is the chief substance in the sides and back of the kernel (the germ face being considered the front of the kernel). This substance comprises about 45 per cent of ordinary corn, but is much more abundant in high protein corn and less abundant in low protein. Although rich in starch, it contains about 10 per cent of protein (more in the high protein corn and less in the low protein corn). It contains a greater total amount of protein than any other part of the kernel.
8. *Corn starch.* The white starchy part occupies the center of the crown end of the kernel and usually partially surrounds the germ. It comprises about 25 per cent of the kernel (less in high protein corn and more in low protein corn). It is poor in protein (5 to 8 per cent).
9. *Hull.* The hull is the very thin outer coat. It comprises about 6 per cent of the kernel and contains a lower percentage of protein (about 4 per cent) than any other part of the kernel.

When the grain sprouts, No. 2, the embryo root, goes down into the ground. No. 5, embryo stem, goes upward out of the ground to make the stalk.

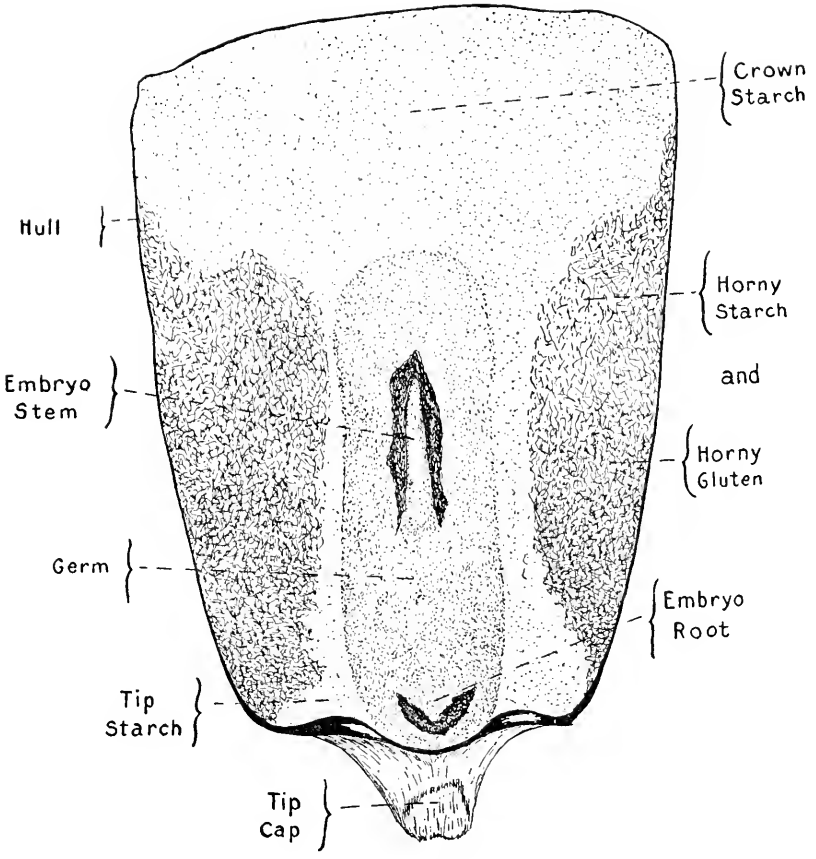

Crown
Starch
Hull
Horny
Starch
and
Embryo
Stem
Horny
Gluten
Germ
Embryo
Root
Tip
Starch
Tip
Cap

FIG. 3.

For seed the grain should be carefully examined as to (1) shape, (2) uniformity or resemblance, (3) germ or viability, *i. e.*, sprouting. In seed corn it is important that the germ be large, sound, and well developed. If a corn is desired which will produce a greater amount of starch or of gluten or of oil, regard must be had to these points in the selection. By selecting grains with very large hearts the oil and protein content is increased. Those with a large amount of white material yield more starch. Grains can be selected to produce a corn for general feed purposes, for meal or for hominy or breakfast food.

It is well not only to have an ear of desired type, but also an ear which has grain of proper kind. By crossing the grain you desire on the chosen type of ear, you can produce corn of desired shape and composition of grain. The weight of the grain is an important item, for in all the markets corn is sold by weight.

If you have corn which belongs to a variety that you have known for some time as a good sound corn, I would prefer this for seed to any striking ear which might appear as a new type. Give the new type a trial for another season, and do not rely upon it for your general crop until you have learned whether it is a desirable type or only a freak. A horse which is of a known breed of fine quality is preferable for a breeder to one that may appear finer, but has no pedigree behind him.

One corn growers' association in Ohio reports that while a cylindrical ear is the best individual specimen, the tapering ears yield the greatest amount of corn per acre.

You have selected your seed or, rather, perhaps, chosen the lot of corn (one bushel or more) which you will use for this purpose. Choose the ear that seems to you to most nearly resemble the picture in table which you think is the type you desire. Now compare each other ear with this one. This can be done by placing a number of ears along a plank or table and putting the type-ear by each in turn. Put aside those that are approved, plant these in the same plat, putting some of the seemingly much desirable in separate rows, each ear to itself.

Perhaps in your lot of corn there are some ears different from the first choice. Take one of these of a distinct character and use it to select others, and plant this lot in a different plat from the first, and see which gives best results as to quantity and quality of corn.

On account of the variety of soil and climate in North Carolina, no one variety of corn will be found that is best for the entire State. Experience alone will prove the vest variety for each locality—the

most desirable for bottom-land, and the difference between the upland and the bottom-land types.

The lot which you deem best on account of shape, etc., may have a grain inferior in some respects. Mix with this corn of desirable quality as to grain, soundness and other desirable characteristics.

You have now selected your seed, as far as eye can aid you. You do not wish to spend time or pay hands in replanting corn. It will be best to take a grain from each side of the ear at different places (numbering the ear), and try these in the sprouting-box, if you think necessary, and discard the ears that do not germinate. But in my experience I have never failed to get what seemed to be a satisfactory stand, where good seed was selected. However, each one can determine this for himself by sprouting some of his seed and comparing the stand when planted from the ears with that not tested by sprouting.

Nineteen hundred and nine was an "A. B. C." year with North Carolina farmers in corn production, and especially in seed selection. In fact, most of them will do the first real selection this year (1910). You cannot produce a reliable variety of new corn in one year. Do not be discouraged, but continue the work until you get what you wish, and then be as careful to preserve your type by proper attention to the seed.

Different soils and environment will require different varieties and types of corn. Seek for that which your farm proves to be most productive of good quality.

In nearly all of the States the following points are used in judging seed corn:

Uniformity,
Trueness to type,
Shape of ear,
Color,
Market condition,
Tips,
Butts,
Uniformity of grain,
Shape of grain,
Length of ear,
Circumference of ear,
Space between rows and grain,
Proportion by weight of shelled corn.

If desired, other points can be added to these, or any of these omitted or combined, as any association may wish.

Each association or other authority can fix the value that each point shall have in determining its total of 100 points.

The usual rule for length and circumference is that circumference, one-third distance from the butt, equals three-fourths of total length.

The points can be consolidated, increased, or diminished in number, as each determining body may conclude will best concur with their ideas.

	Missouri.	Mississippi.	Texas.	Illinois.	Kansas.	Ohio.	Iowa.	Indiana.	Nebraska.	Pennsylvania.	Wisconsin and Maine.
1 Uniformity of exhibit	15	5	5	5	10	----	5	10	5	10	----
2 Maturity and market condition	10	10	10	----	5	----	10	5	5	10	10
3 Purity as shown by color kernel	5	5	10	10	10	10	5	10	10	5	5
4 Purity as shown by color cob	5	5	5	----	---	----	----	----	----	5	5
5 Shape of ear	10	10	10	10	5	10	10	5	5	5	10
6 Proportion length and circumference	10	----	5	----	----	----	----	----	----	----	----
7 Butts	5	5	5	5	5	5	5	5	5	5	5
8 Tips	5	5	5	5	10	5	5	10	10	5	5
9 Space between rows	5	5	5	5	10	----	5	----	5	5	5
10 Per cent corn to ear	10	10	15	10	20	10	10	20	20	15	10
11 Trueness to type	----	10	5	10	----	10	10	----	10	5	10
12 Space between rows at cob	----	5	5	5	----	10	5	10	----	----	5
13 Grain—(*a*) shape	5	10	5	5	5	5	5	5	5	10	5
(*b*) uniformity	5	5	5	5	5	5	10	5	5	10	10
(*c*) germ	10	----	5	10	----	20	----	----	----	----	----
14 Length of ear	5	5	10	10	10	5	10	10	10	5	10
15 Circumference	----	5	----	5	5	5	5	5	5	5	5
	100	100	100	100	100	100	100	100	100	100	100

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. FEBRUARY, 1910. Number 2.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Melville	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
W. H. Eaton	Assistant Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
E. P. Wood	Assistant Veterinarian.
W. E. Hearn	Soil Survey.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, N. C., February 15, 1910.

SIR:—I beg to submit herewith a manuscript discussing the results of the variety, variety distance, and distance tests of corn and cotton conducted on the Test Farms of the Department during the past season, and recommend its publication as the February Bulletin.

Respectfully,

J. L. BURGESS,
Agronomist.

To HON. W. A. GRAHAM,
Commissioner of Agriculture.

TENTH REPORT OF THE GENERAL CROP WORK ON THE DEPARTMENT TEST FARMS FOR SEASON 1909

INCLUDING

VARIETY AND DISTANCE TESTS OF CORN AND COTTON.

By J. L. Burgess, Agronomist,

assisted by

R. W. Scott, Jr., Superintendent Edgecombe Test Farm.
F. T. Meacham, Superintendent Iredell Test Farm.
R. W. Collett, Superintendent Buncombe Test Farm.

On the following pages are recorded the results of this year's work with the variety and distance tests of corn and cotton on the Department's test farms. The testing of these two factors in the production of cotton and corn is of the most fundamental importance, as is evidenced by the difference in yield of different varieties and of different distancing when grown side by side in the same field, on the same type of soil, with identical cultivation and fertilization. Its importance is further emphasized when it is considered that 64.7 per cent (17.5 per cent to cotton and 47.2 per cent to corn) of the cultivated lands of North Carolina are devoted to these two crops, with the small average annual yields of 220 pounds of lint cotton and 18 bushels shelled corn per acre. If by carefully conducted experiments through a number of years the most advantageous distancing and most prolific varieties of corn and cotton on the different types of soil for an average season can be ascertained, and farmers generally be induced to use the best varieties and distances in growing these crops, material assistance will have been rendered in increasing the total amounts per acre of these crops grown in the State. Increasing the average yield of corn 1 bushel and seed cotton 50 pounds per acre will, according to the census of 1900, increase the annual profits of the farmers of North Carolina by about $3,650,000, allowing 60 cents per bushel for shell corn and 3½ cents per pound for seed cotton. This does not appear, with the hearty co-operation of farmers, such a far-distant possibility, in the light of results during the past seven years in our testing of varieties of corn and cotton.

EDGECOMBE TEST FARM.

The work on the Edgecombe Farm last season included the testing of 37 varieties of corn. A large number of varieties of cotton were put out, but untoward weather conditions prevented our getting a sufficiently good stand to justify publishing the results.

A glance at Table No. 1 will reveal a wide variation in the yields of the different varieties tested. It will be noted that the Northern and Western varieties, that have been accustomed to very different soil and climatic conditions, do not yield as well on this farm as varieties previously grown in a lower latitude. Among these Northern and Western varieties may be mentioned Boone County Special, Leaming Yellow, Reid's Yellow Dent, Riley's Favorite, and Iowa Silver Mine.

A large number of the varieties yielded over 30 bushels per acre and a few over 40 bushels per acre. Biggs' Seven Ear made the largest actual yield, but it will be noted that this variety had over 100 per cent of a stand, while Marlboro Prolific yielded over 32 bushels with only 77 per cent of a stand. The lowest yielding varieties were Riley's Favorite, Boone County Special, Parker's Cock's Prolific, and Reid's Yellow Dent.

A great difference in the weight of a measured bushel of these corns will be noted. A number of them weigh as much as 8 pounds above the standard, while one falls 4 pounds below the standard 56-pound bushel. Indeed, but 3 of the varieties have the standard-weight bushel. All the others, but one, weigh over 56 pounds to the bushel.

Table No. 1. RESULTS OF VARIETY TESTS OF CORN ON NORFOLK SANDY LOAM SOIL AT EDGECOMBE TEST FARM, 1909.

Variety.	Per Cent of Perfect Stand.	Number of Ears to Shell One Bushel.	Yield in Bushels of Shelled Corn per Acre.	Pounds of Stover per Acre.	Weight in Pounds of Measured Bushel of Shelled Corn.
Boone County Special	69 0	120	13 7	640	58
Brake's	87 0	92	29 7	1,220	59
Bradburry's Improved	95.0	104	32 2	2,045	60
Biggs' Seven Ear	100 9	204	41 5	2,220	64
Fry's Improved	115 0	120	37.8	2,355	61
Goodman's Prolific	82.0	160	31 5	1,600	62
Hickory King	115 0	200	30 0	3,955	60
Holt's Strawberry	79 0	104	32 2	2,240	57
Iowa Silver Mine	89 0	140	19 5	830	58
Leaming Yellow	96.0	160	19.2	670	59
Marlboro Prolific	77.0	172	32.8	1,305	62
Patton	73.0	144	22.4	1,025	64
Riley's Favorite	28.0	176	5.4	120	60
Sanders' Improved	90 0	152	28.0	1,600	57
Williams	93 0	112	29.7	.....	62
Hasting's Prolific	112.0	216	38.1	2,030	63
Peele's	86 0	168	26.4	1,145	64
Reid's Yellow Dent	89.0	148	16.0	.....	60
Selection 77	89.0	140	30.2	980	60
Selection 138	81.0	112	29.0	1,480	60
Alexander Six Ear	80.0	208	32.9	2,395	60
Boone County White (Ky.)	90.0	136	28.1	1,310	56
Weekley's Improved	109.0	204	40.7	2,390	63
Southern Beauty	83.0	144	27.2	1,810	57
Henry Grady	84.0	100	28.2	2,360	56
Cock's Prolific	73.0	170	25.3	1,425	61
Pride of Ingold	81.0	116	27.6	1,565	64
MacMackin's Gourdseed	93.0	92	24.0	1,355	56
Downing Deep White Grain	85.0	96	26.7	1,930	52
Perry's Deep White Grain	79 0	136	24.0	1,690	59
Wilson's Success	91.0	164	35.9	2,765	62
Thigpen	73 0	164	30.1	1,610	64
Parker's Cock's Prolific	83.0	128	15.6	1,795	62
Collier's Excelsior	82 0	152	25.9	1,110	62
Thompson's Improved	94.0	144	35.0	1,645	61
Grant's Premium	84.0	156	27.7	2,100	61
Johnson's Prolific	90.0	.....	28 2	2,025	61

IREDELL TEST FARM.

Work in the testing of varieties of both cotton and corn was carried on here last season. Table No. 2 shows the results of the variety tests of corn on the Cecil loam soils, of which this farm is largely composed. The test included 37 varieties.

It will be noted that the highest yields here ran somewhat lower than those at the Edgecombe Farm. Parker's Cock's, which ranked among the low yielders at the Edgecombe Farm, made the highest yield here. But five of the varieties made over 30 bushels per acre. The average weight of a bushel of shelled corn is somewhat lower on this farm than on the Edgecombe Farm, but a large number of the varieties have more than the standard number of pounds per bushel.

Parker's Cock's Prolific, Wilson's Success, and Boone County Special led in yields here the past year, while Selection 77 and Peele's made the smallest yields per acre. The prolific corns make the largest yields here, as they do at the Edgecombe Farm. The smallest eared variety, as shown by the table, was Biggs' Seven Ear, which required 200 ears to shell one bushel.

There were 21 varieties of cotton under test on this farm the past season. Table No. 3 shows the results of the test. The yield of seed cotton only is given. There will be noted a wide difference in the yields of the different varieties. The value of the seed cotton at 5 cents a pound ran all the way from $18.37 in the case of the Peterkin to $51.75 in the case of King's Improved—a difference of $33.38 in favor of King's Improved.

The ten highest yielding varieties were King's Improved, Missionary, Shine's Extra Early Prolific, Pullnot, Ninety Day, Alexander Money-maker, Culpepper's Improved, Simpkins' Early Prolific, Russell Big Boll Prolific, and Brown's No. 1. Most of these are small-bolled cottons, which seem better suited to this part of the cotton belt than do the larger bolled sorts. King's Improved has been grown in this part of the State for a long time and seems to have become adapted to the soil and climatic conditions existing here, and is now ready to do its best work.

Column 1 shows the relative germination of the different varieties. It will be noted that no variety had over 86 per cent germination, while some fell as low as 40 per cent. It is very desirable that all seed for planting should have at least 80 per cent germination, but this condition of the seed can be had only by careful handling to prevent heating and subsequent fermentation. It would be well for each planter to test the germination of his cotton seed and seed corn before planting. To do this it is only necessary to take a small sample of 100 seed and plant them in a box containing moist soil and allow them to sprout. The number that comes up and grows off well will represent the percentage of germination. In this way the relative vitality of the seed can be easily ascertained.

In order to ascertain whether a large one-eared variety of corn, if planted thick enough, would yield as much per acre as a prolific variety, a test was planned with three different varieties, two prolific varieties and one one-eared variety, to find their yielding power at different distances in the row. Table No. 4 shows the results of this test. It will be noted that for an average of all distances in the row, Cock's Prolific yielded 22.3, Weekley's Improved 19.6, and Holt's Strawberry, the large one-eared variety, 15.1 bushels per acre. The yield of stover, however, was greater in case of the one-eared variety, but not enough greater to compensate for the reduction in yield of grain.

TABLE No. 2—RESULTS OF VARIETY TESTS OF CORN ON CECIL LOAM SOIL AT IREDELL TEST FARM, 1909.

VARIETY.	Per Cent of Perfect Stand.	Number of Ears to Shell One Bushel.	Yield in Bushels of Shelled Corn per Acre.	Pounds of Stover per Acre.	Weight in Pounds of Measured Bushel of Shelled Corn.
Boone County Special	100	106	31.0	1,600	55.5
Brake's	100	104	23.1	780	57.0
Bradburry's Improved	100	124	22.5	2,520	55.0
Biggs' Seven Ear	100	200	26.0	1,980	55.0
Collier's Excelsior	100	106	22.8	1,600	53 0
Goodman's Prolific	100	152	24.2	2,400	59.0
Hickory King (Tenn)	100	174	21.5	1,490	58.0
Holt's Strawberry	100	100	26.0	2,880	55.0
Iowa Silver Mine	100	124	21.7	1,280	58.0
Johnson's Prolific	100	160	23.0	1,390	59.0
Marlboro Prolific	100	168	26 2	1,960	58.5
Patton	100	132	22.7	1,110	59.0
Riley's Favorite	100	122	15.0	1,150	55.0
Sanders' Improved	100	160	29.0	1,280	60 0
Williams	100	100	25.5	1,600	59.0
Hasting's Prolific	100	188	23.4	2,360	60.0
Peele's	100	168	19 7	820	59.0
Reid's Yellow Dent	100	134	20.7	2,150	56.0
Selection 77 (B. P. I.)	100	122	19.4	1,640	58.0
Selection 138 (B. P. I.)	100	114	27.0	1,320	56.0
Alexander Six Ear	100	180	28 0	2,440	60.0
Boone County White (Ky.)	100	114	26.4	1,130	57.0
Weekley's Improved	100	150	26.5	2,540	59.0
Southern Beauty	100	120	30.4	1,670	56.0
Henry Grady	100	118	23.4	1,960	56.0
Cock's Prolific	100	148	30.8	2,440	60.0
Thompson's Prolific	100	134	25.4	720	59.0
MacMackin's Gourdseed	100	100	25.0	2,050	56.0
Downing's Deep White Grain	100	94	27.8	2,260	56.0
Perry's Deep White Grain	100	102	25.2	1,630	58.5
Wilson's Success	100	134	34.0	1,620	60.5
Thigpen	100	176	28.5	2,000	57 0
Grant's Premium	100	130	28.1	1,030	60.0
Parker's Cock's Prolific	100	126	34.2	1,500	60 0
Pride of Ingold	100	126	29.5	1,530	60.0
American Queen	100	184	27.7	1,760	58.0
Hickory King (Va.)	100	164	28.1	1,830	59.0

TABLE No. 3—RESULTS OF VARIETY TESTS OF COTTON ON CECIL LOAM SOIL AT THE IREDELL TEST FARM, 1909.

VARIETY.	Per Cent Germination of Seed.	Weight in Grams of 100 Bolls.	Pounds of Seed Cotton per Acre at First Picking—October 28.	Pounds of Seed Cotton per Acre at Second and Final Picking—December 3.	Total Pounds Seed Cotton per Acre.	Value of Seed Cotton per Acre at Five Cents a Pound.
Culpepper's Reimproved	65	684	187.5	465.0	652 5	$ 32.62
Shine's Extra Early Prolific	61	495	517.5	412.5	930 0	46 50
Williams	85	434	450.0	150 0	600.0	30 00
Shine's Cluster	85	480	247 5	360 0	607.5	30.37
Alexander Money-maker	48	484	240.0	615.0	855.0	42.75
Edgeworth	81	620	240.0	427.5	667.5	33.37
Mortgage Lifter	70	707	202.5	420.0	622.5	31 12
Thigpen's Prolific	48	736	255.0	217.5	472.5	23.62
Pullnot	70	645	180.0	330.0	510.0	25 50
Sugar Loaf	40	430	547.5	345.0	892.5	44.62
Ninety-Day	55	484	480.0	405.0	885.0	44.25
Cook's Improved	86	580	240.0	360.0	600.0	30 00
Russell Big Boll	63	705	120 0	480 0	600.0	30 00
King's Improved	73	475	600 0	450.0	1,050.0	52 50
Peterkin's Improved	75	530	97.5	270.0	367 5	18 37
Russell's Big Boll Prolific	82	458	202.5	570.0	772.5	38.62
Simpkins' Early Prolific	73	586	435.0	375.0	810.0	40.50
Columbia Long Staple	65	712	157.5	450 0	607 5	30.37
Brown's No. 1	80	542	240 0	525 0	765 0	38.25
Missionary	80	472	690.0	345.0	1,035 0	51 75
Culpepper's Improved	85	552	330.0	480 0	810 0	40 50

TABLE No. 4—RESULTS OF TESTS OF THREE LEADING VARIETIES OF CORN AT DIFFERENT SPACINGS IN THE ROWS ON CECIL LOAM SOIL AT IREDELL TEST FARM, 1909.

VARIETY.	Distance Between Hills in Inches.	Number of Stalks per Plat.	Bushels of Shelled Corn per Acre.	Pounds of Stover per Acre.
Cock's Prolific	20	333	26.0	1,500
Holt's Strawberry	20	294	18.0	2,140
Weekley's Improved	20	250	20.0	1,700
Cock's Prolific	24	283	20 5	2,560
Holt's Strawberry	24	265	12.8	2,100
Weekley's Improved	24	247	18.4	2,520
Cock's Prolific	30	198	18.7	1,600
Holt's Strawberry	30	189	13.0	2,000
Weekley's Improved	30	211	18.8	1,680
Cock's Prolific	36	183	23.5	1,760
Holt's Strawberry	36	163	14 5	1,580
Weekley's Improved	36	187	21.2	1,620
Cock's Prolific	40	153	22.8	1,500
Holt's Strawberry	40	140	17 2	1,400
Weekley's Improved	40	140	19 7	1,520

TABLE No. 5—RESULTS OF DISTANCE TESTS OF CORN ON CECIL LOAM SOIL AT IREDELL TEST FARM, 1909.

(WEEKLEY'S IMPROVED VARIETY USED.)

Distance Between Rows—Feet.	Distance Between Stalks in Rows—Feet.	Number of Stalks per Plat.	Bushels of Shelled Corn per Acre.	Pounds of Stover per Acre.
3½	4	120	16 8	1,420
3½	3	157	20 0	1,600
3½	2½	176	18 2	1,420
3½	2	213	13 1	1,380
4	4	126	15 5	1,620
4	3	148	14 8	1,360
4	2½	170	14 4	1,200
4	2	226	12 8	1,300
4	1½	291	15 2	1,320
5	4	133	23 4	1,560
5	3	164	24 1	1,720
5	2	237	23 5	1,560
5	1½	296	28 1	1,840

TABLE No. 6—RESULTS OF DISTANCE TESTS OF COTTON ON CECIL LOAM SOIL AT IREDELL TEST FARM, 1909.

(KING'S IMPROVED VARIETY USED.)

Distance Between Rows—Feet.	Distance Between Hills—Inches.	Pounds of Seed Cotton at First Picking.	Pounds of Seed Cotton at Second Picking.	Pounds of Seed Cotton per Acre.
3¼	12	24.00	20.25	885
3¼	16	25.25	20 00	905
3¼	20	32.00	24.00	1,120
3¼	24	29.00	21.75	1,015
4	12	26.00	21.50	950
4	16	25.50	22.50	960
4	20	28.50	20.00	970
4	24	23.50	24.00	950

It has long been of special interest to know just how far apart in the row to plant corn in order to make the largest yields. It is evident that the exact distance will depend on the type of soil, its relative fertility, and the variety of corn used. With these factors in mind, the Department planned an experiment on the Cecil loam soil of the Iredell Test Farm with a view to ascertain the proper spacing in the row to obtain the highest yield of corn. The soil was of medium fertility and the variety used was Weekley's Improved. Table No. 5 shows the results of this test. From this table it would seem that for this type of soil in its present state of fertility a corn plant of this variety, to do its best, would need about 7½ square feet of soil in which to grow. The area required by the plant will necessarily vary with soil, seasonal and cultural conditions, and the results here given can be of value only in the way of suggestion to those who have the red loam soils in this part of the State.

An effort has been made, also, to ascertain the proper spacing of cotton in the row for best results. The variety used was King's Improved and the soil was Cecil loam of medium fertility. Table No. 6 shows results of this test in pounds of seed cotton per acre. It will be noted that the most seed cotton per acre was produced in rows 39 inches apart, with plants 20 inches apart in the row. The second highest yield was obtained from rows 39 inches apart with plants 24 inches apart in the row. It would seem, therefore, that on this type of soil with medium fertility, the usual custom of planting cotton 15 inches apart in 3- or 4-foot rows might be changed with advantage.

BUNCOMBE TEST FARM.

A duplicate test was made with corn on the Buncombe Test Farm the past season. One of the tests was placed on the Porter's loam soil that occupies the foothills in the mountains generally; the other was placed on the Toxaway loam found in the Swannanoa and French Broad river bottoms. This duplicate test was planned in order to ascertain any difference in the relative adaptability of the varieties to the upland and bottomland soils in this section of the State. The results obtained on the Porter's loam soil are shown in Table No. 7. There are wide differences in the yields, ranging from 13 1/10 bushels per acre in the case of the Patton variety to 28 bushels in the case of Thompson's Prolific and Boone County White. It will be noted, however, that Boone County White had but 76 per cent of a perfect stand, while Thompson's Prolific had a perfect stand. Had Boone County White had a perfect stand it is but fair to assume that it would have out-yielded the former, as all other influencing factors were the same for both varieties.

It is likely true that most of the corn in this part of the mountain section of the State is grown on bottomland soil, and for this reason a test was planned on the representative bottomland soil of this section. Table No. 8 shows the results of this test. Column 2 shows the percentage of germination of the different varieties, while column 3 shows how much each variety had shrunk from September 30th to January 5th. This column is of special interest in that it will be found that the shrinkage is very different for the different varieties. It ranges from nothing in case of Boone County White, Leaming Yellow, and Reid's Yellow Dent, to 36 per cent in case of Pride of Ingold.

It will be interesting to compare the yields on the bottomland soil with those of the same variety on the upland soil. The two tests were made within 300 yards of each other. It will be found that Patton, which made the lowest yield on the upland soil, led all others in yield on the bottomland soil. The four highest yielders on the bottomland soil were: Patton, Selection 77, Bradburry's Improved, and Boone County White, while the four highest yielders on the upland soil were: Thompson's Prolific, Boone County White, Cock's Prolific, and Hickory King.

TABLE No. 7—RESULTS OF VARIETY TESTS OF CORN ON PORTER'S LOAM SOIL AT BUNCOMBE TEST FARM, 1909.

VARIETY.	Per Cent of Stand.	Yield in Bushels per Acre.	Pounds of Stover per Acre.
Hickory King (Tenn.)	81	24.0	1,500
Boone County White (B. T. F.)	93	21.8	990
Thompson's Prolific	100	28 0	1,350
Iowa Silver Mine	90	20.1	840
Cock's Prolific	99	27.4	1,410
Leaming Yellow	70	16.0	690
Collier's Excelsior	99	21.0	1,170
Sanders' Improved	94	22.2	1,440
Boone County White (Ky.)	76	28.0	1,200
Bradburry's Improved	96	19.7	1,470
Reid's Yellow Dent	100	20.3	765
Weekley's Improved	96	22.7	1,560
Boone County Special (Ill.)	100	19.5	945
Holt's Strawberry	93	20.1	1,800
Selection 77 (B. P. I.)	92	24.0	1,170
Selection 138 (B. P. I.)	91	19.2	1,395
MacMackin's Gourdseed	99	20.7	1,740
Hickory King Va.	91	21 8	1,477
American Queen	90	22 5	1,155
Downing	97	19 7	1,860
Patton	80	13 1	1,020

TABLE No. 8—RESULTS OF VARIETY TESTS OF CORN ON THE TOXAWAY LOAM SOIL AT THE BUNCOMBE TEST FARM, 1909.

VARIETY.	Per Cent of Perfect Stand.	Percentage of Germination.	Number of Ears to Shell One Bushel.	Per Cent of Shrinkage from September 30 to January 5.	Yield in Bushels of Shelled Corn per Acre.	Pounds of Stover per Acre.	Weight in Pounds of Measured Bushel of Shelled Corn.
Boone County Special	94.0	96	102	3.33	25.5	5,970	52 0
Brake's	95.0	89	117	10.50	27.0	2,430	48.0
Bradburry's Improved	93.0	83	148	11.50	20.7	1,755	50 0
Biggs' Seven Ear	100.7	63	192	5.00	25.2	1,980	50.0
Fry's Improved	102.0	95	100	6.66	25.7	2,940	48.0
Goodman's Prolific	90.4	72	176	8.33	16.2	2,175	48.0
Hickory King	107.0	67	136	5.00	25.7	1,770	52.0
Holt's Strawberry	88.0	54	92	19.60	21.1	2,100	42.0
Iowa Silver Mine	94.0	65	109	1.50	23.5	1,410	50.0
Leaming Yellow	91.0	68	123	0.00	20.3	900	54.0
Marlboro Prolific	92.0	83	172	3.33	23.3	1,815	52.0
Patton	96 0	78	96	3.33	28.0	1,515	50.0
Riley's Favorite	65.0	71	132	1.00	8.9	780	52.0
Sanders' Improved	87.0	73	164	10.00	20.1	1,590	50.0
Williams	91.0	96	120	12.50	23.3	1,995	48.0
Hasting's Prolific	91.0	73	224	2.00	13.7	1,890	48.8
Peele's	87.0	56	152	7.50	23.1	1,605	52.0
Reid's Yellow Dent	96.0	32	116	0.00	22.2	1,035	56.0
Selection 77 (B. P. I.)	94.0	57	108	5.00	27.4	1,425	48.0
Selection 138 (B. P. I.)	82.0	92	112	8.33	22.7	1,530	52.0
Alexander Six Ear	90.0	95	200	7.00	15.4	1,980	48.0
Boone County White (Ky.)	88.0	77	100	0.00	26.1	1,230	48.5
Henry Grady	98.0	30	128	10.00	16.0	3,105	45.5
Cock's Prolific	91.0	94	180	6.00	25.2	1,980	51.0
Weekley's Improved	91.0	97	172	10.66	21.4	1,920	50.0
Southern Beauty	90.4	80	116	9.00	24.0	1,920	48.0
Pride of Ingold	90.4	88	172	36.00	24.4	1,680	51.6
MacMackin's Gourdseed	84.0	90	108	8.33	21.0	1,530	48.0
Downing's White Deep Grain	84.0	89	124	17.00	19.2	1,800	46.0
Perry's White Deep Grain	84.0	88	128	15.00	17.5	1,920	48.0
Wilson's Success	84.0	84	156	10.00	24.0	1,980	50.0
Thigpen	95.0	94	186	14.00	22.7	2,010	54.0
American Queen	98.0	74	184	7.50	24.0	1,800	50.0
Parker's Cock's Prolific	88.0	95	180	10.00	19.2	1,470	50.5
Collier's Excelsior	91.0	6	118	8.33	19.2	1,530	51.6
Hickory King (Tenn.)	100.7	96	152	3.33	22.7	1,860	50.6
Johnson's Prolific	88.0	88	164	10.00	15.9	1,200	50.6
Grant's Premium	83.0	83	130	10.00	22.2	1,950	50.0
Boone County White (B. T. F.)	97.0	92	124	7.50	15.9	1,170	54.0

SOURCES OF SEED TESTED.

CORN.

American Queen	R. P. DALTON, Winston, N. C.
Brake's	J. L. BRAKE, Rocky Mount, N. C.
Bradburry's Improved	J. E. BRADBURRY, Athens, Ga.
Biggs' Seven Ear	NOAH BIGGS, Scotland Neck, N. C.
Cock's Prolific	EDGECOMBE TEST FARM, Rocky Mt., N. C.
Fry's Improved	H. C. FRY, Clarksville, Ga.
Goodman's Prolific	J. K. GOODMAN, Mount Ulla, N. C.
Hasting's Prolific	HASTING SEED COMPANY, Atlanta, Ga.
Hickory King	A. O. LEE, Bartee, Va.
Holt's Strawberry	T. W. WOOD, Richmond, Va.
Henry Grady	W. G. HEADEN, Austill, Ga.
Jarvis Improved	T. L. JARVIS, Moyock, N. C.
Parker's Cock's Prolific	T. B. PARKER, Raleigh, N. C.
MacMackin's Gourdseed	BUREAU OF PLANT INDUSTRY.
Patton	R. S. PATTON, Swannanoa, N. C.
Peele's	T. G. PEELE, Rich Square, N. C.
Southern Beauty	L. A. STROUPE, Tobaccoville, N. C.
Weekley's Improved	IREDELL TEST FARM, Statesville, N. C.
Williams	S. C. WILLIAMS, Franklinton, N. C.
Wilson's Success	F. D. WILSON, Chase City, Va.
Selection 77	BUREAU PLANT INDUSTRY.
Selection 138	BUREAU PLANT INDUSTRY.
Boone County White (Ky.)	C. W. CALDWELL, Danville, Ky.
Alexander Six Ear	ALEXANDER SEED COMPANY, Augusta, Ga.
Pride of Ingold	W. I. WRIGHT, Ingold, N. C.
Downing White Deep Grain	H. W. DOWNING, Fayetteville, N. C.

COTTON.

Alexander Money-maker	ALEXANDER SEED COMPANY, Augusta, Ga.
Brown's No. 1	M. L. BROWN, Decatur, Ga.
Culpepper's Improved	W. KILLEBREW, Rocky Mount, N. C.
Dozier's Improved	M. D. DOZIER, Camden, N. C.
Ninety-Day	J. G. TRUITT, LaGrange, Ga.
Hite's Early Prolific	W. T. HITE, Augusta, Ga.
Pullnot	J. E. BRADBURRY, Athens, Ga.
Cook's Improved	J. R. COOK, Schley, Ga.
King's Improved	IREDELL TEST FARM.
Peterkin Improved	J. N. PETERKIN, Fort Mott, S. C.
Russell Big Boll	EDGECOMBE TEST FARM.
Sugar Loaf	I. W. MITCHELL, Youngsville, N. C.
Shine's Extra Early Prolific	J. A. SHINE, Faison, N. C.
Simpkins' Prolific	W. A. SIMPKINS, Raleigh, N. C.
Williams	C. S. WILLIAMS, Franklinton, N. C.
Thigpen's Prolific	R. L. THIGPEN, Mildred, N. C.
Shine's Cluster	J. A. SHINE, Faison, N. C.
Russell Big Boll Prolific	J. L. THORNTON, Alexander City, Ala.
Morgan's Ten Lock	J. W. MORGAN, Glendale, S. C.
Wilson's Matchless	F. D. WILSON, Littleton, N. C.

LEAF TOBACCO SALES FOR JANUARY, 1910.

Pounds sold for producers, first hand	10,302,168
Pounds sold for dealers	303,446
Pounds resold for warehouses	653,881
Total	11,259,495

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. MARCH, 1910. Number 3.

I. ANALYSES OF FERTILIZERS—FALL SEASON, 1909.

II. REGISTRATION OF FERTILIZERS.

PUBLISHED MONTHLY AT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Melville	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
W. H. Eaton	Assistant Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
E. P. Wood	Assistant Veterinarian.
*W. E. Hearn	Soil Survey.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, N. C., March 15, 1910.

SIR:—I submit herewith analyses of fertilizers made in the laboratory of samples collected during the past fall. These analyses show fertilizers to be about as heretofore, and to be, generally, what was claimed for them. I recommend that it be issued as the March Bulletin.

Very respectfully,

B. W. KILGORE,
State Chemist.

To HON. WILLIAM A. GRAHAM,
Commissioner of Agriculture.

I. ANALYSES OF FERTILIZERS—FALL SEASON, 1909.

B. W. KILGORE, State Chemist.

By W. G. HAYWOOD, Fertilizer Chemist,
and
J. M. PICKEL, J. Q. JACKSON and W. H. STROWD, Assistant Chemists.

The analyses presented in this Bulletin are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during the fall months of 1909. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the Bulletin with the claims made for the fertilizers actually used, the farmer can know by, or before, the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

TERMS USED IN ANALYSES.

Water-soluble Phosphoric Acid.—Phosphate rock, as dug from the mines, mainly in South Carolina, Florida and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural, state the phosphate has three parts of lime united to the phosphoric acid (called by chemists tri-calcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

Reverted Phosphoric Acid.—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

Available Phosphoric Acid is made up of the water-soluble and reverted; it is the sum of these two.

Water-soluble Ammonia.—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-seed meal, dried blood, tankage, and fish scrap. The first two of these (nitrate of soda and sulphate of ammonia) are easily soluble in water and become well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

Organic Ammonia.—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay, will determine the quickness of their action as fertilizers. With short season, quick-growing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion, or all, of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

Total Ammonia is made up of the water-soluble and organic; it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

VALUATIONS.

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid and potash in the materials supplying them. These values are only approximate (as the costs of fertilizing materials are liable to change, as other commercial products are), but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacturers.

Relative value per ton, or the figures showing this, represents the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid and potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

The values used last season were:

VALUATIONS FOR 1909.

In Unmixed or Raw Materials.

For phosphoric acid in acid phosphate....	4	cents per pound.
For phosphoric acid in bone meal, basic slag and Peruvian guano.....	3½	cents per pound.
For nitrogen	18	cents per pound.
For potash	5	cents per pound.

In Mixed Fertilizers.

For phosphoric acid.....	4½	cents per pound.
For nitrogen	19½	cents per pound.
For potash	5½	cents per pound.

HOW RELATIVE VALUE IS CALCULATED.

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8—2—1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

Percentage, or Lbs. in 100 Lbs.	Value Per 100 Lbs.	Value Per Ton, 2,000 Lbs.
8 pounds available phosphoric acid at 4½ cents...	0.36 ×20=	$7.20
2 pounds potash at 5½ cents.....	0.11 ×20=	2.20
1.65 pounds nitrogen at 19½ cents.....	0.321×20=	6.42
Total value	0.791×20=	$15.82

Freight and merchant's commission must be added to these prices. Freight rates from the seaboard and manufacturing centers to interior points are given in the following table:

FREIGHT RATES FROM THE SEABOARD TO INTERIOR POINTS.—From the Published Rates of the Associated Railways of Virginia and the Carolinas. In car-loads, of not less than ten tons each, per ton of 2,000 pounds. Less than car-loads, add 20 per cent.

Destination.	From Wilmington, N. C.	From Norfolk and Portsmouth, Va.	From Charleston, S. C.	From Richmond, Va.
Advance	$3.20	$3.20	$3.40	$3.20
Apex	2.70	----------	3.80	3.00
Ashboro	3.20	3.20	3.60	3.20
Asheville	4.00	4.00	4.00	4.00
Chapel Hill	2.95	3.20	3.90	3.20
Charlotte	2.65	3.20	2.85	3.20
Clayton	2.48	2.86	3.63	2.80
Cherryville	3.85	3.60	3.40	3.63
Clinton	1.60	3.00	3.20	3.00
Creedmoor	3.00	3.00	3.80	3.00
Cunningham	3.00	2.40	4.00	2.40
Dallas	3.00	3.60	3.40	3.60
Davidson College	3.00	3.20	2.20	3.20
Dudley	1.70	3.00	3.20	3.00
Dunn	2.00	2.80	3.20	2.80
Durham	2.80	2.83	3.20	2.83
Elkin	3.60	3.20	3.60	3.20
Elm City	2.10	2.60	3.20	2.60
Fair Bluff	1.60	3.80	2.40	3.80
Fayetteville	1.80	3.00	3.00	3.00
Forestville	2.85	3.00	3.80	3.06
Gastonia	3.12	3.25	3.12	3.25
Gibson	2.10	3.50	2.10	3.50
Goldsboro	1.80	2.80	3.20	2.80
Greensboro	2.96	3.00	3.40	3.00
Hamlet	2.00	3.00	3.60	3.00
Henderson	3.00	2.83	3.55	2.83
Hickory	3.20	3.60	3.20	3.60
High Point	3.00	3.08	3.40	3.08
Hillsboro	2.88	2.88	2.68	2.88
Kernersville	3.00	3.00	3.40	3.00
Kinston	2.10	2.80	3.50	2.80
Laurel Hill	1.90	2.40	3.80	3.40
Laurinburg	1.90	3.40	3.80	3.40
Liberty	2.72	3.60	3.80	3.60
Louisburg	2.95	3.00	3.80	3.00
Lumberton	1.60	3.60	3.70	3.60
Macon	3.05	3.00	3.85	3.00
Madison	3.00	3.00	3.40	3.00
Matthews	2.60	3.20	3.20	3.20
Maxton	1.80	3.40	2.70	3.40
Milton	3.44	2.40	4.00	2.40
Mocksville	3.36	3.20	3.40	3.20
Morven	2.55	3.60	2.50	3.60
Mount Airy	3.20	3.40	3.80	3.40
Nashville	2.30	2.90	3.40	2.90
New Bern	1.25	1.75	3.95	1.75
Norwood	3.68	3.20	3.20	2.23
Oxford	3.04	2.83	3.55	2.83
Pineville	2.77	3.25	3.00	3.20
Pittsboro	2.60	3.30	4.10	3.30
Polkton	2.40	3.00	2.20	3.00
Raleigh	2.56	2.83	3.40	2.83
Reidsville	3.00	2.96	3.40	2.36
Rockingham	2.10	3.00	3.80	3.00
Rocky Mount	2.20	2.50	3.40	2.50
Ruffin	3.28	2.80	3.40	2.20
Rural Hall	3.28	3.20	3.60	3.20
Rutherfordton	3.05	3.65	3.05	3.65
Salisbury	3.25	3.20	3.20	3.20
Sanford	2.10	3.00	3.40	3.00
Selma	2.10	2.80	3.20	2.80
Shelby	2.90	3.60	3.90	3.60
Siler City	2.60	3.60	3.80	3.60
Smithfield	2.20	2.80	3.20	2.80
Statesville	3.50	3.20	3.60	3.20
Stem	2.95	2.83	3.80	2.83
Tarboro	2.30	2.40	3.00	2.40
Waco	2.90	3.60	3.40	3.60
Wadesboro	2.30	3.00	2.50	3.00
Walnut Cove	3.00	3.00	3.40	3.00
Warrenton	3.05	3.25	4.10	3.25
Warsaw	1.50	3.00	3.20	3.00
Washington	2.65	1.75	2.25	1.50
Weldon	2.95	1.90	3.85	1.90
Wilson	2.00	2.60	3.20	2.60
Winston-Salem	3.00	3.00	3.40	3.00

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.										
	Brand claiming				**8.00**			**.82**	**1.00**	**3.00**	**$ 14.60**
7751	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Guano	Waynesville	R	8.75	.40	1.26	1.66	2.02	**2.97**	16.08
	Brands claiming				**8.00**			**1.65**	**2.00**	**2.00**	**15.82**
7796	Acme Mfg. Co., Wilmington, N. C.	Gem Fertilizer	Maiden	R	8.75	1.35	.50	1.86	2.26	**1.87**	16.66
7742	American Fertilizer Co., Norfolk, Va.	Bone and Peruvian Guano	Monroe	R	9.70	1.08	.62	1.70	2.07	**1.76**	16.67
7778	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Asheville	R	8.29	.66	1.28	1.94	2.36	2.29	17.54
7693	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Bone and Potash Compound.	Winston	S	8.10	.80	1.10	**1.90**	2.31	2.15	17.06
7767	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Eli Ammoniated Fertilizer	Warrenton	R	9.00	1.08	.70	1.78	2.16	2.12	17.37
7649	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Roxboro	S	8.27	.92	.82	1.74	2.11	**1.99**	16.42
7713	Farmers Guano Co., Raleigh, N. C.	State Standard Guano	Catawba	R	**6.67**	.94	.84	1.78	2.16	**1.91**	**15.04**
7810	Hampton Guano Co., Norfolk, Va.	Shirley Superphosphate	Maiden	S	8.30	1.18	.68	1.86	2.26	2.02	16.95
7761	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone	High Point	R	8.26	1.26	.60	1.86	2.26	2.23	17.14
7798	Navassa Fertilizer Co., Wilmington, N. C.	Navassa Grain Fertilizer	Maiden	R	8.42	.58	1.08	1.60	1.94	**1.90**	15.91
7687	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Statesville	R	8.51	.84	.84	1.68	2.04	2.22	16.65
7795	Pearsall & Co., Wilmington, N. C.	Eagle Guano	Whiteville	S	9.17	.50	1.12	**1.62**	**1.97**	2.26	17.06
7719	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Troutman	S	8.05	1.22	.58	1.80	2.19	**1.98**	16.44
7676	Powhatan Chemical Co., Norfolk, Va.	Magic Tobacco Grower	Mount Airy	R	8.80	.40	.64	**1.04**	**1.26**	2.70	**14.95**
7808	Raisin-Monumental Co., Baltimore, Md.	Raisin's Empire Guano	Conover	R	8.40	.66	.84	**1.50**	**1.82**	**1.91**	**15.51**
7664	Reidsville Fertilizer Co., Reidsville, N. C.	Banner Fertilizer	Pomona	R	**7.91**	.46	1.20	1.66	2.02	2.01	**15.80**
7634	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	N. Wilkesboro	S	9.49	.94	.40	**1.34**	**1.63**	**1.82**	**15.77**
7690	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer	Statesville	R	8.26	.38	1.22	**1.60**	**1.94**	**1.98**	15.85
7633	----do	Royster's Special Wheat Fertilizer.	Rockford	R	**7.97**	1.06	.56	**1.62**	**1.97**	**1.94**	**15.62**
7691	Swift's Fertilizer Works, Atlanta, Ga.	Swift's Red Steer Standard Grade Guano.	Winston	S	8.60	.84	.86	1.70	2.07	2.02	**16.59**
7821	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Standard	Statesville	R	**7.85**	.66	.94	**1.60**	**1.94**	2.26	**15.79**

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.								
	Brands claiming				**8 00**			**1 65**	**2 00**	**2 00**	$ **15.82**
7692	Union Guano Co., Norfolk, Va.	Fish Brand Ammoniated Guano	Winston	R	8.69	.90	.92	1.82	2 21	2 01	17.13
7653	....do	Old Honesty Guano	Elkin	S	10 04	1.04	.84	1 88	2 29	1.82	18.37
7779	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Asheville	R	**7.92**	1.10	.98	2.08	2.53	**1.30**	16.67
7739	....do	Allison & Addison's Old Hickory Guano.	Benson	S	8.04	.54	1.10	1.64	1 99	2.56	16.45
7762	....do	Ajax Guano	Oxford	D	9.04	.96	.54	**1 50**	**1.82**	**1 90**	16.08
7790	....do	Davie & Whittle's Owl Brand Guano.	Charlotte	R	8.12	.88	.96	1.84	2.24	3.01	17.79
7665	....do	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano	Greensboro	R	8.32	.28	.98	**1.26**	**1.53**	2.25	**14 88**
7706	....do	Farmers' Favorite Fertilizer	Vineland	R	8.42	.42	1.34	1 76	2.14	2.26	16.93
7731	....do	Southern Chemical Co.'s Electric Tobacco Guano.	Kernersville	S	8.28	1.02	.60	**1 62**	**1.97**	2.06	16.14
7722	....do	Tinsley & Co.'s Stonewall Guano	Claremont	R	8.82	.88	.54	**1.42**	**1.73**	**1 65**	**15 29**
7647	....do	V.-C. C. Co.'s Plant Food	Roxboro	R	8.53	.76	1.06	1 82	2.21	2.03	17.00
7800	....do	Va. State Fertilizer Co.'s Guano	Kings Mountain	R	9.24	.86	.64	**1.50**	**1.82**	**1 71**	16.05
	Brands claiming				**8.50**			1.65	**2 01**	**2 00**	**16 29**
7736	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Superphosphate	Dunn	S	9.16	.78	.90	1.68	2.04	2.72	17 79
	Brand claiming				**8 00**			1.65	**2 01**	**3 00**	**16.94**
7792	Armour Fertilizer Works, Wilmington, N. C.	Armour's Carolina Cotton Special Fertilizer.	Wilmington	R	**7.84**	.56	1.02	**1.58**	**1 92**	**2.60**	**16 08**
	Brands claiming				**8 00**			**2 06**	**2.50**	**3 00**	**18 53**
7828	Acme Mfg. Co., Wilmington, N. C.	Tip Top Crop Grower	Mount Olive	D	8 10	1.44	.86	2.30	2.80	3.11	19 68
7645	Royster, F. S., Guano Co., Norfolk, Va.	Orinoco Tobacco Guano	Durham	R	8.09	.96	1.38	2.34	2 84	**2.78**	19 44
7823	Va.-Car. Chemical Co., Richmond, Va.	Durham Fert. Co.'s N. C. Official Farmers' Alliance Guano.	Magnolia	R	8.09	1.08	1.10	2 18	2.65	3.03	19.11
7824	....do	Virginia State Fertilizer Co.'s Buffalo Guano.	Mount Olive	S	8.77	1.46	.88	2.34	2.84	3.25	20 59
	Brands claiming				**8.00**			**2 47**	**3.00**	**3 00**	**20.13**
7701	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer.	Wilmington	R	8.17	1.48	.90	**2 38**	2.89	**2.72**	**19.82**

7789	----do	Armour's Tobacco Special Fertilizer.	Charlotte	R	8.80	1.48	1.30	2 78	3 38	3.02	22 08
7735	Baugh & Sons Co., Norfolk, Va.	Baugh's H. G. Tobacco Guano	Lumberton	R	7 77	1.38	1.10	2.48	3 02	3.12	20 10
7797	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Horne's Best	Gastonia	R	8.52	.92	1.68	2.60	3 16	3.67	21 84
7799	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Guano	Maiden	R	8.37	1.58	1.06	2.64	3 21	3 22	21 37
7807	Patapsco Guano Co., Baltimore, Md.	Choctaw Guano	Hickory	R	8 38	1 68	2 60	2 28	2 77	3 43	20 21
7741	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters Soluble Guano	Wadesboro	R	8 54	.53	2 20	2 73	3.32	3 27	21 93
7809	Union Guano Co., Winston, N. C.	Union Guano Co.'s Union Homestead Guano.	Newton	R	8 09	1.30	1 00	2 30	2 80	2 87	19 19
7791	Va.-Car. Chemical Co., Richmond, Va.	Powers, Gibbs & Co.'s Old Kentucky High Grade Tobacco Manure.	Charlotte	R	8.59	1 52	.80	2.32	2 82	3.85	21 01
	Brands claiming				8 00			2 47	3 00	5 00	22 33
7793	Navassa Guano Co., Wilmington, N. C.	Navassa Blood and Meal Mixture.	Wilmington	R	8 90	1.02	1 14	2 18	2 83	5.23	22 19
7688	Patapsco Guano Co., Baltimore, Md.	Patapsco Plant Food for Tobacco and Truck.	Statesville	S	8 31	1 88	.84	2.72	3 31	4 80	23 39
	Brands claiming				8 00			3 29	4 00	4 00	24 47
7827	Navassa Guano Co., Wilmington, N. C.	Navassa Special Guano	Magnolia	R	7 97	1 70	1 40	3 10	3.77	5 16	24.94
7826	Pearsall & Co., Wilmington, N. C.	Pearsall's Fish and Potash Compound, High Grade.	Mount Olive	R	8.61	2.12	.74	2 86	3 48	4 78	24.16
7737	Swift's Fertilizer Works, Atlanta, Ga.	Swift's High Grade Monarch Vegetable Grower.	Chadbourn	R	8 31	.88	2 28	3 16	3 84	3 67	23 84
	Brand claiming				9 00			.82	1 00	2 00	13 50
7644	Ober, G., & Sons Co., Baltimore, Md.	Ober's Farmers' Mixture	Hillsboro	R	10 00	.62	.54	1 16	1.41	1 96	15 68
	Brands claiming				9 00			82	1 00	3 00	14 60
7662	Patapsco Guano Co., Baltimore, Md.	Coon Brand Guano	Pilot Mountain	R	9 10	.72	.46	1 18	1 43	2 88	15 96
7749	Va.-Car. Chemical Co., Richmond, Va.	Bigelow's Crop Guano	Lincolnton	R	9 40	.48	36	.84	1 02	2 31	14 28
7740	----do	McCormick's Wheat and Grain Guano.	Charlotte	S	9 25	.36	58	91	1 14	3 37	15 70
	Brand claiming				9 00			1 65	2 01	1 00	15 64
7648	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano.	Durham	R	9 28	.56	1 16	1 72	2 09	1 01	16 17
	Brand claiming				9 00			1 65	2 01	2 00	18 74
7730	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Standard Guano.	Huntersville	R	9 09	.90	64	1 54	1 87	1 87	16.78
	Brand claiming				9 00			1 85	2 25	1 00	16 41
7822	Bradley Fertilizer Co., Boston, Mass.	Standard Sea Fowl Guano	Charlotte	R	10 65	1 44	62	2 06	2 50	1 55	19 32
	Brand claiming				9 00			2 47	3 00	2 00	19 93
7747	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s L. & M. Special.	Lincolnton	S	9 50	1.20	1 01	2 24	2 72	1 75	19 21
	Brand claiming				9 00			2 47	3 00	4 00	22 13
7750	Va.-Car. Chemical Co., Richmond, Va.	Great Texas Cotton Grower	Lincolnton	S	9 70	1.42	1 31	2 76	3 36	2 85	22 63
	Brand claiming				9 00			2 47	3 00	6 00	24 33
7663	Reidsville Fertilizer Co., Reidsville, N. C.	Lion Brand Fertilizer	Reidsville	R	9.55	70	2 00	2 70	3 28	5 65	25 58
	Brand claiming				9 00			2 88	3 50	9 00	29 23
7700	American Fertilizer Co., Norfolk, Va.	American Fertilizer Co.'s Strawberry and Asparagus Guano.	Burgaw	B	9 00	2 80	22	3 02	3 67	9 22	30 11

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
					MIXED FERTILIZERS.						
	Brand claiming				**9 25**			**2.06**	**2.50**	**2.00**	**$ 18.56**
7718	Patapsco Guano Co., Baltimore, Md.	Patapsco Guano	Mooresville	R	9 80	1 76	.44	2 20	2.67	2.21	19.83
	Brand claiming				**10 00**			**.82**	**1.00**	**3.00**	**15.50**
7748	Chickamauga Fertilizer Works, Chattanooga, Tenn.	Chickamauga Corn Special	Hendersonville	R	9 61			.98	1.19	3.56	16.39
	Brand claiming				**2 00**			**3 29**	**4.00**	**6.00**	**21.23**
7661	Germofert Mfg. Co., Charleston, S. C.	Germofert Nature's Plant Food		D	5.75	2.00	1.32	2.32	4.04	5.10	23.73
	Brand claiming				**13 00**			**2 06**	**2 50**		**16 52**
7694	Baugh & Sons Co., Norfolk, Va.	Baugh's Pure Dissolved Animal Bone.	Winston	R	13.92			2.28	2.77		17.95
	Brands claiming				**8.00**					**4.00**	**11.80**
7788	American Fertilizer Co., Norfolk, Va.	American Special Potash Mixture for Wheat.	Charlotte	S	9.07					3.02	11.48
7772	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special Bone and Potash.	Asheville	R	10.14					**3.10**	12.60
7673	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture.	Mount Airy	R	8.11					**3.35**	**10.98**
7685	Pocahontas Guano Co., Lynchburg, Va.	Cherokee Grain Special	Mount Airy	R	8.95					**3.50**	11.90
7726	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Defiance Bone and Potash.	Kernersville	R	8.87					**3.63**	12.19
7675	Powhatan Chemical Co., Richmond, Va.	Magic Grain and Grass Grower	Mount Airy	R	9.49					**3.26**	12.13
7680	Richmond Guano Co., Richmond, Va.	Winter Grain and Grass Grower	Mount Airy	S	9.29					**2.78**	**11.42**
7695	Swift Fertilizer Works, Atlanta, Ga.	Swift's Plantation Standard Grade Phosphate and Potash.	Winston	R	**7.78**					4.22	11.64
7640	Union Guano Co., Winston, N. C.	Union Wheat Mixture	N. Wilkesboro	R	8.95					**3.38**	11.77
7655	Va.-Car. Chemical Co., Richmond, Va.	Click's Special for Wheat	Elkin	R	8.80					**3.17**	**11.40**
7666	----do	----do	Walnut Cove	R	8.79					**3.85**	12.25
7656	----do	Durham Fertilizer Co.'s Carr's Special Wheat Grower.	Walnut Cove	S	9.75					**3.50**	12.62
7776	----do	----do	Asheville	R	8.50					**3.27**	**11.25**
7641	----do	Old Dominion Guano Co.'s Miller's Sp'l Wheat Mixture.	Elkin	R	8.36					**3.88**	11.79

7745	----do	Travers & Co.'s Special Wheat Compound.	Biltmore	R	8.88					3.20	11.51
	Brand claiming				**9.00**					**4 00**	**12.50**
7773	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Bone and Potash Fertilizer.	Morganton	R	9.17					3.85	12 49
	Brand claiming				**10.50**					**1.50**	**11.02**
7765	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Great Wheat and Corn Grower.	Oxford	D	10.53					1.40	11.02
	Brands claiming				**10 00**					**2.00**	**11 20**
7734	Acme Mfg. Co., Wilmington, N. C.	Acme Bone and Potash	Maxton	R	10 77					3.63	13.69
7712	American Fertilizer Co., Norfolk, Va.	Dissolved Bone and Potash for Wheat and Corn.	Catawba	R	10.57					1.74	11.43
7771	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Buncombe Wheat Grower.	Asheville	R	10.04					1.55	10.74
7812	Hampton Guano Co., Norfolk, Va.	Dauntless Potash Mixture	Maiden	R	10.30					1.98	11.43
7774	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Wheat Fertilizer	Morganton	R	9.14					2.45	10 92
7794	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.	Maiden	R	10.67					1 80	11 36
7817	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters Bone and Potash	Statesville	R	10.92					2 03	12.06
7679	Pocahontas Guano Co., Richmond, Va.	Carrington's Superior Grain Compound.	Mount Airy	R	10 31					2 00	11.48
7632	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture	Ronda	R	10.01					2.02	11.23
7667	Reidsville Fertilizer Co., Reidsville, N. C.	Bone and Potash	Pomona	R	10.50					3 55	13.35
7638	Richmond Guano Co., Richmond, Va.	Bone and Potash Mixture	N. Wilkesboro	R	10.23					1 82	11.21
7696	Swift Fertilizer Works, Atlanta, Ga.	Swift's Field and Farm Standard Grade Phos. and Potash.	Winston	R	9.48					2.45	11 23
7818	----do	Swift's Standard Grade Wheat Grower.	Fayetteville	D	10 79					1.56	11 43
7727	Union Guano Co., Winston, N. C.	Union 10-2 Bone and Potash	Lexington	R	9.23					2 32	10 86
7652	----do	Union Bone and Potash	Elkin	S	9 93					1 58	10 67
7683	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's McGavock's Special Potash Mixture.	Mount Airy	R	9.69					1 55	10 42
7721	----do	----do	Catawba	R	10.10					1 89	10 95
7755	----do	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Salisbury	R	11.39					1.50	11 90
7651	----do	Durham Fertilizer Co.'s Durham Bone and Potash Mixture.	Durham	R	10 93					1.82	11 84
7744	----do	Durham Fertilizer Co.'s Standard Wheat Grower.	Biltmore	R	11.15					1 33	11 50
7657	----do	Old Dominion Alkaline Bone and Potash.	Crutchfield	S	10.59					1 68	11 38
7658	----do	Southern Chem. Co.'s Mammoth Wheat and Grass Grower.	Crutchfield	R	10.06					1 69	10 91
7654	----do	Travers & Co.'s Bone and Potash Compound.	Elkin	S	11.92					1 35	12 21
7725	----do	Travers & Co.'s Capital Bone and Potash Compound	Rutherfordton	R	9.85					3 17	12 17

Percentage Composition or Parts per 100.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.										
	Brand claiming				**10 00**					**2.00**	**$ 11 20**
7793	Va.-Car. Chemical Co., Richmond, Va.	Va. State Fertilizer Co.'s Dissolved Bone and Potash.	Kings Mountain	R	11.65					1 68	11.77
	Brands claiming				**10.00**					**4 00**	**13 40**
7795	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special Bone and Potash Mixture.	Gastonia	R	12 27					3.33	14.70
7723	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture.	Waynesville	R	10.90					5.03	15.34
7760	Miller Fertilizer Co., Baltimore, Md.	Miller Fertilizer Co.'s 10-4 Mixture.	High Point	R	10.42					4 11	13.90
7678	Pocahontas Guano Co., Lynchburg, Va.	Wabash Wheat Mixture	Mount Airy	R	10.14					4 09	13.53
7635	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Bone and Potash Mixture.	Ronda	S	10.56					4 04	13 95
7681	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture	Mount Airy	R	10.48					**3.68**	13.48
7636	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture.	Rockford	R	10 00					**3 98**	**13 38**
7639	Union Guano Co., Winston, N. C.	Quaker Grain Mixture	N. Wilkesboro	R	10.45					**3.70**	13.47
7668	Va.-Car. Chemical Co., Richmond, Va.	Special Potash Mixture	Greensboro	R	10.06					4 01	13.46
7792	....do	Va. State Fertilizer Co.'s XX Potash Mixture.	Kings Mountain	R	10.35					**3.73**	13.42
	Brand claiming				**10.00**					**8.00**	**15.60**
7746	Asheville Packing Co., Asheville, N. C.	High Grade Special Potash Mixture.	Hendersonville	R	10.98					**4.95**	**15.32**
	Brand claiming				**11.00**					**5 00**	**15 40**
7775	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Quickstep Bone and Potash.	Asheville	R	12.02					**3.68**	**14 87**
	Brand claiming				**12.00**					**4.00**	**15 20**
7811	Union Guano Co., Winston, N. C.	Union Guano Co.'s Bone and Potash.	Hickory	R	**8 95**					**3.56**	**11.99**

	Brands claiming				**12.00**							$	**9.60**
7715	Navassa Guano Co., Wilmington, N. C.	Navassa Acid Phosphate	Catawba	R	12.09								9.67
7729	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Durham Acid Phosphate.	Mocksville	R	12.57								10.06
7756	----do	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Salisbury	R	15.25								12.20
7732	----do	Southern Chemical Co.'s Tar Heel Acid Phosphate.	High Point	R	12.75								10.20
	Brands claiming				**13.00**								**10.40**
7785	Acme Manufacturing Co., Wilmington, N. C.	Acme Acid Phosphate	Charlotte	R	13.30								10.64
7671	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Sterling Acid Phosphate.	Walnut Cove	R	14.15								11.32
7650	Columbia Guano Co., Norfolk, Va.	Columbia Dissolved Bone	Hillsboro	S	13.32								10.66
7699	Etiwan Fertilizer Co., Charleston, S. C.	Diamond Soluble Bone	Winston	R	14.58								11.66
7714	Farmers Guano Co., Raleigh, N. C.	Farmers Acid Phosphate	Catawba	R	13.22								10.58
7711	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone	Wilmington	R	14.65								11.72
7698	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Winston	S	14.16								11.33
7697	Union Guano Co., Winston, N. C.	Union Dissolved Bone	Winston	R	13.26								10.61
7769	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s I X L Acid Phosphate	Marion	R	13.29								10.63
7724	----do	Davie & Whittle's Owl Brand Acid Phosphate.	Rutherfordton	R	13.34								10.67
7659	----do	Durham Fertilizer Co.'s Double Bone Phosphate.	Crutchfield	R	**12.84**								**10.27**
7754	----do	Durham Fertilizer Co.'s Double Bone Phosphate Extra Strong	Salisbury	R	14.49								11.59
7660	----do	Old Dominion Guano Co.'s Acid Phosphate.	Crutchfield	S	13.04								10.43
	Brands claiming				**14.00**								**11.20**
7782	American Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate	Charlotte	R	14.39								11.51
7770	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Standard Phosphoric Acid.	Asheville	S	15.34								12.27
7766	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Climax Dissolved Bone	Warrenton	R	**13.41**								**10.73**
7803	Hampton Guano Co., Norfolk, Va.	Hampton's Acid Phosphate	Maiden	R	14.90								11.92
7801	Navassa Guano Co., Wilmington, N. C.	Navassa 14 Per Cent Acid Phosphate.	Maiden	R	**13.93**								**11.14**
7642	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate	Ronda	R	14.60								11.68
7684	Powhatan Chemical Co., Richmond, Va.	High Grade Acid Phosphate	Mount Airy	R	**13.44**								**10.75**
7643	Royster, F. S., Guano Co., Norfolk, Va.	14 Per Cent Acid Phosphate	Rockford	R	14.58								11.66
7804	Swift Fertilizer Works, Atlanta, Ga.	Swift's Cultivator High Grade Acid Phosphate.	Maiden	R	**13.63**								**10.90**
7819	Union Guano Co., Winston, N. C.	Union Guano Co.'s High Grade Acid Phosphate.	Statesville	R	14.16								11.33
7672	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Fulton Acid Phosphate.	Greensboro	R	14.97								11.98

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.										
	Brands claiming				**14.00**						**$ 11 20**
7768	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand High Grade Dissolved Bone.	Biltmore	D	14 10						11.28
7816	----do----	Durham Fertilizer Co.'s Standard Grade Acid Phosphate.	Hickory	R	15 27						12 22
7763	----do----	Va.-Car. Chemical Co.'s 14 Per Cent Acid Phosphate.	Henderson	D	14 40						11.52
7758	----do----	Southern Chemical Co.'s Red Cross Acid Phosphate.	Salisbury	R	15 17						12.14
7707	----do----	J. G. Tinsley & Co.'s Powhatan Acid Phosphate.	Rose Hill	R	14 54						11.63
7753	----do----	S. W. Travers & Co.'s Dissolved Bone Phosphate.	Hendersonville	R	14.74						11.79
	Brands claiming				**16.00**						**12 80**
7783	American Fertilizer Co., Norfolk, Va.	American High Grade Acid Phosphate.	Charlotte	R	16.04						12 83
7708	Armour Fertilizer Works, Wilmington, N. C.	16 Per Cent Acid Phosphate	Wilmington	R	16.35						13.08
7784	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	16 Per Cent Caraleigh Acid Phosphate.	Gastonia	D	16.22						12.98
7716	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate.	Claremont	D	17.45						13.96
7815	Patapsco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Hickory	R	17.10						13 68
7805	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate	Maiden	R	17.95						14.36
7752	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone Phosphate	Shelby	R	**15.56**						**12 45**
7814	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 16 Per Cent Acid Phosphate.	Conover	S	16.30						13.04
7630	Swift Fertilizer Works, Atlanta, Ga.	High Grade Swift's Special Acid Phosphate.	Winston	R	16.34						13.07
7813	Union Guano Co., Winston, N. C.	Union 16 Per Cent Acid Phosphate.	Newton	D	**15.30**						**12.24**
7781	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand High Grade Acid Phosphate.	Charlotte	D	**15 41**						**12.33**

7780	----do	Durham Fertilizer Co.'s Acid Phosphate.	Gastonia	R	16.24						12.99
7743	----do	Va.-Car. Chemical Co.'s 16 Per Cent Acid Phosphate.	Monroe	R	16.31						13.05
7682	----do	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.	Mount Airy	R	16.40						13.12
7757	----do	----do	Salisbury	R	16.35						13.08
7802	----do	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.	Kings Mountain	R	16.69						13.35
	Brands claiming										
7799	Calder Bros., Wilmington, N. C.	Genuine German Kainit	Vineland	R						12 00	12 00
7786	Farmers Cotton Oil Co., Wilson, N. C.	----do	Gastonia	P						12.50	12 50
7738	Swift Fertilizer Works, Atlanta, Ga.	Pure German Kainit	Chadbourn	S						12 10	12 10
7764	Va.-Car. Chemical Co., Richmond, Va.	Genuine German Kainit	Oxford	R						12.24	12.24
	Brand claiming									11 96	11 96
7820	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Muriate of Potash	Statesville	P						50.00	50 00
	Brands claiming									47.54	47.54
7710	Coe-Mortimer Co., Charleston, S. C.	Nitrate of Soda	Wilmington	B				14.83	18 00		53.38
7829	Va.-Car. Chemical Co., Richmond, Va.	----do	Mount Olive	P				14.96	18.19		53.86
	Brands claiming							15 20	18.48		54.72
7674	Martin, D. B., Co., Baltimore, Md.	Martin's Pure Ground Bone	Winston	R				2.47	3.00		24 29
7759	Miller Fertilizer Co., Baltimore, Md.	Ground Bone	High Point	R				3.00	3.65		a24.54
	Brands claiming							2.70	3.28		b24.35
7670	Baugh & Sons Co., Norfolk, Va.	Baugh's Raw Bone Meal	Madison	D				3.70	4 50		29.11
7677	Pocahontas Guano Co., Richmond, Va.	Raw Bone Meal	Mount Airy	S				3.96	4.81		c27.38
7720	Royster, F. S., Guano Co., Norfolk, Va.	Pure Raw Bone Meal	Salisbury	S				3 66	4 45		d26.53
7646	Union Guano Co., Winston, N. C.	Pure Bone Meal	Reidsville	B				3.96	4.81		e27 85
7669	Va.-Car. Chemical Co., Richmond, Va.	Pure Raw Bone	Greensboro	R				4 24	5.15		f29.93
	Brand claiming							4.12	5.01		g29.67
7631	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	N. Wilkesboro	R				2.88	3.50	3.25	
	Brand claiming							1.89	2.30	2.72	h23.03
7689	Peruvian Guano Corporation, Charleston, S. C.	----do	Winston	R				4 13	5.02	2 00	
	Brand claiming							3 80	4.62	1 85	i24.29
7686	Martin, D. B., Co., Baltimore, Md.	Pure Animal Bone and Potash	Winston	D				1.65	2.00	2 50	20.39
								1 98	2 41	2 27	j23.92

N, D, R, S, B, P, Y and W refer to the mechanical condition of fertilizers, as follows: N—fine; D—good; R—fair; S—coarse; B—very coarse; P—damp; Y—lumpy; W—wet.

(a) Total Phosphoric Acid found, 19.63, valued at 3½ cents per pound.
(b) Total Phosphoric Acid found, 20.90, valued at 3½ cents per pound.
(c) Total Phosphoric Acid found, 18.75, valued at 3½ cents per pound.
(d) Total Phosphoric Acid found, 19.08, valued at 3½ cents per pound.
(e) Total Phosphoric Acid found, 19.43, valued at 3½ cents per pound.
(f) Total Phosphoric Acid found, 20.95, valued at 3½ cents per pound.
(g) Total Phosphoric Acid found, 21.20, valued at 3½ cents per pound.
(h) Total Phosphoric Acid found, 18.10, valued at 3½ cents per pound.
(i) Total Phosphoric Acid found, 10.63, valued at 3½ cents per pound.
(j) Total Phosphoric Acid found, 19.58, valued at 3½ cents per pound.

II. FERTILIZER BRANDS REGISTERED FOR 1910.

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Atlantic Chemical Corporation, Norfolk, Va.—			
Atlantic High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Atlantic 14 Per Cent Acid Phosphate	14.00	....	....
Atlantic Dissolved Bone	13.00	....	....
Atlantic Acid Phosphate	12.00	....	....
Atlantic 10 and 5 Bone and Potash Mixture	10.00	....	5.00
Atlantic 10 and 4 Bone and Potash Mixture	10.00	....	4.00
Atlantic Bone and Potash for Grain	10.00	....	3.00
Atlantic Bone and Potash Mixture	10.00	....	2.00
Atlantic Meal Compound	9.00	2.27	2.00
Atlantic Cotton Grower	9.00	2.06	1.00
Atlantic Special Guano	9.00	1.65	1.00
Atlantic Special Truck Guano	8.00	3.30	4.00
Atlantic High Grade Tobacco Guano	8.00	2.47	3.00
Atlantic High Grade Cotton Guano	8.00	2.47	3.00
Atlantic Tobacco Grower	8.00	2.06	3.00
Atlantic Tobacco Compound	8.00	2.06	2.00
Atlantic Special Wheat Fertilizer	8.00	1.65	2.00
Atlantic Soluble Guano	8.00	1.65	2.00
Atlantic 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Atlantic 7 Per Cent Truck Guano	7.00	5.77	7.00
Atlantic Potato Guano	7.00	4.12	5.00
Pure Raw Bone Meal.....Total	21.50	3.71	....
Corona Cotton Compound	9.00	1.65	3.00
Oriental High Grade Guano	8.00	3.30	4.00
Paloma Tobacco Guano	8.00	3.30	4.00
Boon's Special Guano	8.00	2.47	4.00
Apex Peanut Grower	8.00	1.02	4.00
Perfection Peanut Grower	7.00	....	5.00
Nitrate of Soda	....	15.22	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Geo. L. Arps & Co., Norfolk, Va.—			
Arps' H. G. 16 Per Cent Acid Phosphate	16.00	....	....
Arps' "Go-a-Head" Guano for Trucks, Cotton and Tobacco	8.00	3.30	4.00
Arps' Tobacco Guano	8.00	2.47	3.00
Arps' Quick Growth for All Crops	8.00	2.47	3.00
Arps' Premium Guano for Cotton, Tobacco and All Spring Crops	8.00	1.65	2.00
Arps' Standard Truck Guano	7.00	4.12	5.00
Arps' Potato Guano	6.00	5.76	5.00
Arps' Scuppernong Guano for Trucks	6.00	4.12	7.00
14 Per Cent Acid Phosphate	14.00	....	....
Geo. L. Arps & Co.'s Big Yield Guano	8.00	1.65	2.00
Genuine German Kainit	....	....	12.00
Acme Manufacturing Co., Wilmington, N. C.—			
Acme Acid Phosphate	16.00	....	....
Acme High Grade Acid Phosphate	14.00	....	....
Acme 13 Per Cent Acid Phosphate	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Acme Bone and Potash	11.00	....	2.00
Acme Melon Grower	10.00	3.30	5.00
Acme Bone and Potash	10.00	....	4.00
Acme Bone and Potash	10.00	....	2.00
Acme Cotton Grower	9.00	2.27	2.00
Acme Plumb Good Fertilizer	8.00	3.30	6.00
Acme Special Fertilizer for Cotton	8.00	4.12	7.00
Acme Crop Grower	8.00	2.47	4.00
Acme Plant Food	8.00	2.47	2.50
Acme Fertilizer for Tobacco	8.00	2.47	2.50
Acme Fertilizer	8.00	2.47	2.50
Acme Special Grain Fertilizer	8.00	1.65	2.00
Acme Root Crop Guano	7.00	4.12	7.00
Acme Standard Truck Guano	7.00	4.12	5.00
Acme High Grade Guano	6.00	4.95	8.00
Acme Truck Guano	6.00	3.30	8.00
Acme Corn Guano	6.00	2.47	3.00
Acme Top Dresser	....	7.42	3.00
Gibson's Melon Grower	10.00	3.30	5.00
Quickstep Fertilizer	8.00	3.30	4.00
Quickstep Fertilizer for Tobacco	8.00	3.29	4.00
Currie's High Grade Fertilizer	8.00	2.47	4.00
Best's Fish Scrap Guano, 8-3-3	8.00	2.47	3.00
Pee Dee Special Fertilizer	8.00	2.47	3.00
Pee Dee Special for Tobacco	8.00	2.47	3.00
Tiptop Crop Grower	8.00	2.06	3.00
Tiptop Tobacco Grower	8.00	2.06	3.00
Lattimer's Complete Fertilizer	8.00	2.06	2.00
Best's Complete Fertilizer, 8-2½-2	8.00	2.06	2.00
Gem Fertilizer	8.00	1.65	2.00
Gem Fertilizer for Tobacco	8.00	1.65	2.00
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.85	....
12 Per Cent Tankage	....	9.85	....
Muriate of Potash	....	....	48.00
Pure German Kainit	....	....	12.00
Ashepoo Fertilizer Co., Charleston, S. C.—			
High Grade Ashepoo Dissolved Phosphate	16.00	....	....
High Grade Ashepoo Acid Phosphate	14.00	....	....
High Grade Ashepoo XXXX Acid Phosphate	14.00	....	....
H. G. Ashepoo Bone and Potash	12.00	....	2.00
H. G. Ashepoo Cantaloupe Guano	10.00	2.46	10.00
High Grade Ashepoo Watermelon Guano	10.00	3.29	5.00
High Grade Ashepoo Superpotash Acid Phosphate	10.00	....	4.00
High Grade Ashepoo Fruit Grower	8.00	3.91	2.75
High Grade Ashepoo Perfection Guano	8.00	3.29	6.00
High Grade Ashepoo Guano	8.00	3.29	4.00
High Grade Ashepoo Special Cotton-seed Meal Guano	8.00	2.46	4.00
High Grade Ashepoo Bird and Fish Guano	8.00	2.46	3.00
High Grade Ashepoo Meal Mixture	8.00	2.46	3.00
High Grade Ashepoo X Tobacco Fertilizer	8.00	2.46	3.00
High Grade Ashepoo Golden Tobacco Producer	8.00	2.46	3.00
High Grade Ashepoo Ammoniated Superphosphate	8.00	2.46	2.00
High Grade Ashepoo Farmers' Special	8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
High Grade Ashepoo Truck Guano	7.00	4.12	5.00
High Grade Ashepoo Vegetable Guano	5.00	4.12	5.00
High Grade Ashepoo Nitrogenous Top Dressing	3.00	7.00	2.00
High Grade Eutaw Acid Phosphate	14.00	....	....
H. G. Eutaw Superpotash Acid Phosphate	10.00	....	4.00
High Grade Eutaw X Golden Fertilizer	8.00	2.46	4.00
High Grade Eutaw Special Cotton-seed Meal Guano	8.00	2.46	4.00
High Grade Taylor's Circle Guano	9.00	1.65	4.00
High Grade Carolina XXX Guano	8.00	2.46	3.00
Standard Ashepoo XXX Acid Phosphate	13.00	....	....
Standard Ashepoo Acid Phosphate and Potash.	12.00	....	1.00
Standard Ashepoo Dissolved Bone	12.00	....	....
Standard Ashepoo XX Acid Phosphate	12.00	....	....
Standard Ashepoo Potash and Acid Phosphate.	11.00	....	1.00
Standard Ashepoo Potash Compound	10.00	....	3.00
Standard Ashepoo Wheat and Oats Specific	9.50	1.65	1.00
Standard Ashepoo Fertilizer	9.00	1.85	1.00
Standard Ashepoo Harrow Brand Raw Bone Superphosphate	9.00	1.65	2.00
Standard Ashepoo Guano	8.50	2.06	1.00
Standard Ashepoo XX Guano	8.50	1.65	2.00
Standard Ashepoo Circle Guano	8.00	2.06	2.00
Standard Ashepoo XXX Guano	8.00	1.65	2.00
Standard Ashepoo Special Fertilizer	8.00	1.65	2.00
Standard Eutaw XXX Acid Phosphate	13.00	....	....
Standard Eutaw Acid Phosphate and Potash.	12.00	....	1.00
Standard Eutaw XX Acid Phosphate	12.00	....	....
Standard Eutaw Potash Acid Phosphate	11.00	....	1.00
Standard Eutaw Fertilizer	9.00	1.85	1.00
Standard Eutaw XXX Guano	9.00	1.65	2.00
Standard Eutaw XX Guano	8.50	1.65	2.00
Standard Eutaw Circle Guano	8.00	2.06	2.00
Standard Carolina Acid Phosphate	13.00	....	....
Standard Circle Bone	13.00	....	....
Standard Coomassie Acid Phosphate	12.00	....	....
Standard Palmetto Potash Acid Phosphate	11.00	....	1.00
Standard Enoree Acid Phosphate and Potash.	10.00	....	2.00
Standard Coomassie Circle Fertilizer	8.00	1.65	2.00
Standard Carolina Guano	8.00	1.65	2.00
Standard P. D. Fertilizer	8.00	1.65	2.00
Standard Bronwood Acid Phosphate	8.00	....	4.00
Taylor's XX Ammoniated Dissolved Fertilizer.	10.00	.82	1.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	45.00
Nitrate of Potash	....	....	18.00
German Kainit	....	....	12.00
The Armour Fertilizer Works, Atlanta, Chicago and Wilmington—			
Armour's Raw Bone Meal.....Total	22.00	3.70	....
Armour's Slaughter House Fertilizer	8.00	1.65	2.00
Armour's Special Top Dresser	....	7.82	4.00
17 Per Cent Acid Phosphate	17.00	....	....
16 Per Cent Acid Phosphate	16.00	....	....
Star Phosphate	14.00	....	....
13 Per Cent Acid Phosphate	13.00	....	....
12 Per Cent Acid Phosphate	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Phosphoric Acid and Potash	10.00	....	5.00
Superphosphate and Potash	10.00	....	4.00
M. H. White & Co.'s Special Corn Mixture	10.00	....	2.00
Phosphate and Potash No. 1	10.00	....	2.00
Ammoniated Dissolved Bone and Potash	10.00	1.65	2.00
African Cotton Grower	9.00	2.47	3.00
Bone and Dissolved Bone with Potash	9.00	1.65	3.00
Bone, Blood and Potash	8.00	4.11	7.00
Van Lindley's Special	8.00	4.11	2.00
Special Trucker	8.00	3.30	4.00
All Soluble	8.00	2.88	4.00
Truck and Berry Special	8.00	2.47	10.00
Fertilizer No. 836	8.00	2.47	6.00
Cotton Special	8.00	2.47	3.00
Tobacco Special	8.00	2.47	3.00
Carolina Cotton Grower	8.00	2.47	2.00
Berry King	8.00	2.06	4.00
Gold Medal for Tobacco	8.00	2.06	3.00
Sweet Potato Special	8.00	2.06	3.00
Champion	8.00	2.06	2.50
King Cotton	8.00	2.06	2.00
High Grade Potato	8.00	1.65	10.00
Fruit and Root Crop Special	8.00	1.65	5.00
Carolina Cotton Special	8.00	1.65	3.00
Standard Cotton Grower	8.50	1.65	2.00
General	8.00	1.65	2.00
Phosphate and Potash No. 2	8.00	....	5.00
7 Per Cent Trucker	6.00	5.76	5.00
Manure Substitute	6.00	3.30	4.00
Manure Substitute	6.00	3.30	4.00
10 Per Cent Trucker	5.00	8.24	3.00
Top Dresser	5.00	8.24	2.00
Special Formula for Tobacco	4.00	3.30	5.00
Harvey's Special	4.00	3.30	4.00
10 Per Cent Tankage	2.00	8.24	....
Nitrate of Soda	....	14.81	....
Dried Blood	....	13.16	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
Armour Fertilizer Works, Baltimore, Atlanta and Wilmington, N. C.			
Fertilizer No. 846	8.00	3.30	6.00
Phosphate and Potash No. 3	8.00	....	4.00
5 Per Cent Trucker	6.00	4.12	7.00
American Fertilizing Co., Norfolk, Va.—			
American High Grade Acid Phosphate	16.00	....	....
American Standard Cotton Grower	10.00	1.65	2.00
American Formula for Wheat and Corn	10.00	....	5.00
American Bone Mixture	9.00	.83	2.00
American Nonpareil Tobacco Grower	8.00	3.29	4.00
American Eagle Guano	8.00	2.47	3.00
American No. 1 Fertilizer	8.00	2.06	3.00
American No. 2 Fertilizer	8.00	1.65	2.00
American Special Potash Mixture for Wheat	8.00	....	4.00
American 7-7-7 for Irish Potatoes	7.00	5.76	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
American Fish Scrap Guano	7.00	3.29	4.00
Bone Meal .....Total	22.50	3.71	....
Bone and Peruvian Guano	8.00	1.65	2.00
High Grade Acid Phosphate	14.00	....	....
Eagle Brand Acid Phosphate	13.00	....	....
Acid Phosphate	12.00	....	....
Double Extra Bone and Potash	12.00	....	5.00
Double Dissolved Bone and Potash	10.00	....	4.00
Dissolved Bone and Potash for Corn and Wheat	10.00	....	2.00
Strawberry and Asparagus Guano	9.00	2.88	9.00
Pitt County Special Fertilizer	9.00	2.88	5.00
Special Formula Guano for Yellow Leaf Tobacco	9.00	2.88	5.00
Blood and Bone Compound	8.50	2.06	1.00
Peruvian Mixture	8.50	1.65	1.50
Peruvian Mixture Guano Especially Prepared for Sweet Potatoes	8.00	3.29	5.00
N. C. and S. C. Cotton Grower	8.00	3.29	4.00
J. G. Miller & Co.'s Yellow Leaf Fertilizer	8.00	2.47	3.00
Bob White Fertilizer for Tobacco	8.00	2.06	1.50
A. L. Hanna's Special	8.00	1.65	2.00
Cooper's Genuine Eagle Island	8.00	1.65	2.00
10 Per Cent Ammoniated Guano	7.00	8.24	2.50
Standard 7 Per Cent Ammonia Guano	7.00	5.76	5.00
Special Potato Guano	7.00	4.12	7.00
Special Potato Guano	6.00	4.12	7.00
Kale, Spinach and Cabbage Guano	7.00	4.12	4.00
Stable Manure Substitute	7.00	2.47	4.00
Nitrate of Soda	....	14.83	....
Ground Fish Scraps	....	8.24	....
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Atlantic Fertilizer Co., Baltimore, Md.—			
Farmers' Alkaline Bone	10.00	....	2.00
American Agricultural Chemical Co., New York—			
A. A. C. Co.'s Fine Ground Bone.....Total	22.88	2.47	....
A. A. C. Co.'s Superphosphate	16.00	....	....
A. A. C. Co.'s New Rival Crop Producer	10.00	.82	1.00
A. A. C. Co.'s Fidelity Crop Grower	8.00	.82	3.00
A. A. C. Co.'s Palmetto Alkaline Phosphate	8.00	....	4.00
A. A. C. Co.'s Bull Head Potato and Vegetable Manure	6.00	4.11	7.00
A. A. C. Co.'s Nitrate of Soda	....	15.00	....
A. A. C. Co.'s Muriate of Potash	....	....	49.00
A. A. C. Co.'s Sulphate of Potash	....	....	48.00
A. A. C. Co.'s Genuine German Kainit	....	....	12.00
Baker's Tobacco Fertilizer	8.00	2.47	3.00
Canton Chemical Gem Phosphate	12.00	....	....
Canton Chemical Animal Bone Fertilizer	9.00	1.85	4.00
Canton Chemical Baker's Tobacco Fertilizer	8.00	2.47	3.00
Canton Chemical Superior High Grade Fertilizer	8.00	2.47	3.00
Canton Chemical CCC Special Compound	8.00	2.06	6.00
Canton Chemical Baker's Standard High Grade Guano	8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Canton Chemical Virginia Standard Manure..	8.00	2.06	2.00
Canton Chemical Baker's Fish Guano.....	8.00	1.65	2.00
Canton Chemical Game Guano.....	8.00	1.65	2.00
Canton Chemical Excelsior Trucker.....	7.00	4.11	5.00
Canton Chemical Truckers' Special 7 Per Cent.	6.00	5.76	5.00
Detrick's XXtra Acid Phosphate.....	14.00	....	....
Detrick's P. & B. Special Fertilizer.....	12.00	....	3.00
Detrick's Superior Animal Bone Fertilizer...	9.00	1.85	4.00
Detrick's Special Tobacco Fertilizer.....	8.00	2.47	3.00
Detrick's Vegetator Ammoniated Superphosphate	8.00	2.06	3.00
Detrick's Kangaroo Komplete Kompound.....	8.00	1.65	3.00
Detrick's Royal Crop Grower.....	8.00	1.65	2.00
Detrick's Fish Mixture.....	8.00	1.65	2.00
Detrick's Special Trucker.....	7.00	4.11	5.00
Detrick's Gold Basis.....	6.00	5.76	5.00
Detrick's Gold Eagle.....	6.00	2.47	6.00
Lazaretto Acid Phosphate.....	14.00	....	....
Lazaretto High Grade Dissolved Phosphate and Potash	12.00	....	5.00
Lazaretto Retriever Animal Bone Fertilizer..	9.00	1.85	4.00
Lazaretto Peanut Grower.....	9.00	.82	3.00
Lazaretto Challenge Fertilizer.....	8.00	2.47	3.00
Lazaretto Special Tobacco and Potato Fertilizer	8.00	2.47	3.00
Lazaretto Climax Plant Food.....	8.00	2.06	3.00
Lazaretto Universal Compound.....	8.00	2.06	2.00
Lazaretto Crop Grower.....	8.00	1.65	2.00
Lazaretto Early Trucker.....	7.00	4.11	5.00
Lazaretto Truckers' Favorite.....	6.00	5.76	5.00
Pure Ground Bone.....Total	20.59	3.70	....
Reese Pacific Guano for Tobacco.....	8.50	2.47	2.50
Reese Pacific Guano.....	8.00	1.65	2.00
Slingluff's British Mixture.....	8.00	2.06	2.50
Zell's Dissolved Phosphate.....	14.00	....	....
Zell's High Grade Potash Fertilizer.....	10.00	....	4.00
Zell's Electric Phosphate.....	10.00	....	2.00
Zell's Royal High Grade Fertilizer.....	9.00	2.06	2.00
Zell's Victoria Animal Bone Compound.....	9.00	1.85	4.00
Zell's Special Compound for Potatoes and Vegetables	8.00	2.47	4.00
Zell's Tobacco Fertilizer.....	8.00	2.47	4.00
Zell's Bright Tobacco Grower.....	8.00	2.47	3.00
Zell's Reliance High Grade Manure.....	8.00	2.47	3.00
Zell's Special Compound for Tobacco.....	8.00	1.65	2.00
Zell's Calvert Guano.....	8.00	1.65	2.00
Zell's Ammoniated Superphosphate.....	8.00	1.65	2.00
Zell's Fish Guano.....	8.00	1.65	2.00
Zell's Truck Grower.....	7.00	4.11	5.00
Zell's 7 Per Cent Potato and Vegetable Manure.	6.00	5.76	5.00
Zell's 10 Per Cent Trucker.....	5.00	8.23	3.00
The American Agricultural Chemical Co., Baltimore, Md.—			
Canton Chemical Baker's Dissolved S. C. Phosphate	14.00	....	....
Canton Chemical Soluble Alkaline Phosphate.	12.00	....	3.00
Canton's Chemical Soluble Phosphate and Potash	10.00	....	2.00
Detrick's Victory Alkaline Bone.....	12.00	....	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Detrick's Soluble Phosphate and Potash	10.00	....	2.00
Detrick's Quickstep Phosphate for Potatoes and Tobacco	8.00	2.47	4.00
Lazaretto Alkaline Bone Phosphate	12.00	....	3.00
Lazaretto Dissolved Phosphate and Potash	10.00	....	2.00
The American Agricultural Chemical Co. Royal Alkaline Bone	10.00	....	4.00
The American Agricultural Chemical Co. Enterprise Alkaline Bone	8.00	....	5.00
A. D. Adair & McCarty Bros., Atlanta, Ga.—			
Adair's High Grade Dissolved Bone, No. 16	16.00	....	....
Adair's High Grade Dissolved Bone	14.00	....	....
Adair's Dissolved Bone	12.00	....	....
Adair's H. G. Blood and Bone	10.00	2.47	3.00
Adair's Soluble Pacific Guano	10.00	1.65	2.00
Adair's Wheat and Grass Grower, No. 8	10.00	....	8.00
Adair's Wheat and Grass Grower, No. 6	10.00	....	6.00
Adair's Wheat and Grass Grower, No. 5	10.00	....	5.00
Adair's Wheat and Grass Grower	10.00	....	4.00
Adair's Blood, Bone and Tankage Guano	9.00	.82	2.00
Adair's Ammoniated Dissolved Bone	8.00	1.65	2.00
Adair's Special Potash Mixture, No. 6	8.00	....	6.00
Adair's Special Potash Mixture, No. 5	8.00	....	5.00
Adair's Special Potash Mixture	8.00	....	4.00
A. & M. 13-4	13.00	....	4.00
David Harum Extra High Grade Guano	10.00	3.30	4.00
H. G. Potash Compound, No. 8	10.00	....	8.00
H. G. Potash Compound, No. 6	10.00	....	6.00
H. G. Potash Compound, No. 5	10.00	....	5.00
High Grade Potash Compound	10.00	....	4.00
McCarty's Potash Formula, No. 5	12.00	....	5.00
McCarty's Potash Formula, No. 4	12.00	....	4.00
McCarty's Potash Formula	12.00	....	2.00
McCarty's High Grade Corn Grower	10.00	1.65	2.00
McCarty's High Grade Cotton Grower	10.00	1.65	2.00
McCarty's Wheat Special	10.00	.82	3.00
McCarty's Corn Special	10.00	.82	3.00
Special Wheat Compound	10.00	1.65	4.00
Special Corn Compound	10.00	1.65	4.00
Special Vegetable Compound	10.00	1.65	4.00
Special Potato Compound	10.00	1.65	4.00
Special Corn Grower	8.00	1.65	6.00
Special Wheat Grower	8.00	1.65	6.00
Special Potato Grower	8.00	1.65	6.00
Special Vegetable Grower	8.00	1.65	6.00
Old Time Fish Scrap Guano	10.00	1.65	2.00
Standard Corn Grower	8.00	1.65	2.00
Planters' Soluble Fertilizer	8.00	1.65	2.00
Golden Grain Compound	8.00	.82	3.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	50.00
Asheville Packing Co., Asheville, N. C.—			
Asheville Packing Co.'s Extra H. G. Potash Mixture	13.00	....	4.00
Asheville Packing Co.'s Extra H. G. Fertilizer	10.00	3.30	4.00
Asheville Packing Co.'s Extra H. G. Blood and Bone	10.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Asheville Packing Co.'s Extra H. G. Cotton Special	10.00	1.65	4.00
Asheville Packing Co.'s H. G. Wheat, Corn and Oat Special	10.00	1.65	2.00
Asheville Packing Co.'s High Grade Biltmore Wheat Grower	10.00	1.65	2.00
Asheville Packing Co.'s Standard Bone and Potash	10.00	.82	1.00
Asheville Packing Co.'s H. G. Special Potash Mixture	10.00	....	4.00
Asheville Packing Co.'s Special XXX Wheat Grower	10.00	....	2.00
Asheville Packing Co.'s Standard Potato	9.00	.82	2.00
Asheville Packing Co.'s Extra H. G. Vegetable Special	8.00	4.12	5.00
Asheville Packing Co.'s H. G. Special Tobacco and Vegetable Fertilizer	8.00	2.47	3.00
Asheville Packing Co.'s Extra H. G. Potato Special	8.00	1.65	6.00
Asheville Packing Co.'s Complete Fertilizer	8.00	1.65	2.00
Asheville Packing Co.'s Corn and Wheat	8.00	.82	3.00
Asheville Packing Co.'s Special Bone and Potash	8.00	....	4.00
Baugh & Sons Co., Phila., Pa., and Norfolk, Va.—			
Baugh's Raw Bone Meal, Warranted Pure, Total	21.50	3.70	....
Baugh's 16 Per Cent Acid Phosphate	16.00	....	....
Baugh's Pure Bone and Muriate of Potash Mixture ....Total	15.00	2.47	5.00
Baugh's High Grade Acid Phosphate	14.00	....	....
Baugh's Pure Dissolved Animal Bones	13.00	2.06	....
Baugh's High Grade Cotton and Truck Guano,	10.00	1.65	2.00
Baugh's High Grade Potash Mixture	10.00	....	4.00
Baugh's Soluble Alkaline Superphosphate	10.00	....	2.00
Baugh's Special Guano	8.00	3.30	6.00
Baugh's Fish, Bone and Potash	8.00	3.30	4.00
Baugh's Fruit and Berry Guano	8.00	2.47	10.00
Baugh's Special Tobacco Guano	8.00	2.47	5.00
Baugh's Grand Rapids High Grade Truck Guano	8.00	2.47	3.00
Baugh's Sweet Potato Guano for Sweet Potatoes, Peas and Melons	8.00	2.47	3.00
Baugh's High Grade Tobacco Guano	8.00	2.47	3.00
Baugh's Complete Animal Base Fertilizer	8.00	1.65	5.00
Baugh's Fish Mixture	8.00	1.65	2.00
Baugh's Animal Base and Potash Compound for all Crops	8.00	1.65	2.00
Baugh's Wheat Fertilizer for Wheat and Grass,	8.00	1.65	2.00
Baugh's Southern States Excelsior Guano	8.00	1.21	3.00
Baugh's Southern States Guano for Bright Tobacco	7.00	2.88	7.00
Baugh's Potato and Truck Special	7.00	2.88	7.00
Baugh's Fine Ground Fish	6.87	8.23	....
Baugh's 7 Per Cent Potato Guano	6.00	5.76	5.00
Baugh's Cabbage Guano	6.00	5.76	5.00
Baugh's Peruvian Guano Substitute for Potatoes and All Vegetables	6.00	4.12	7.00
Baugh's 5—6—5 Guano	6.00	4.12	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Baugh's New Process 10 Per Cent Guano	5.00	8.23	2.50
Baugh's Special Potato Manure	5.00	1.65	10.00
Baugh's Wrapper Leaf Brand for Seed Leaf Tobacco	3.50	3.30	5.00
Baugh's Soluble Top Dresser for All Crops	....	8.23	3.00
Baugh's Fine Ground Tankage	....	7.40	....
Randolph's Bone and Potash Mixture for All Crops	10.00	....	3.00
Hassell's Tobacco Guano	9.00	2.26	2.00
Glover's Special Potato Guano	7.00	3.30	8.00
Wilson's Special for Tobacco	6.00	2.47	6.00
Sulphate of Ammonia	....	20.57	....
Nitrate of Soda	....	15.23	....
Fine Ground Blood	....	13.00	....
Muriate of Potash	....	....	48.00
High Grade Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
M. J. Best & Sons, Goldsboro, N. C.			
Genuine German Kainit	....	....	12.00
W. G. Buie Co., Laurinburg, N. C.—			
Nitrate of Soda	....	14.85	....
J. A. Benton, Ruffin, N. C.—			
Benton's North Carolina Bright Fertilizer	9.00	1.65	2.00
Baltimore Fertilizer Co., Baltimore, Md.—			
Honest Acid Phosphate	14.00	....	....
Honest Bone and Potash	10.00	....	2.00
Honest Sweet Potato Grower	8.00	2.40	4.00
Honest Ammoniated Bone	8.00	1.60	2.00
Honest Revenue	7.00	2.40	6.00
Honest Dixie Trucker	6.00	4.00	7.00
Honest Trucker	6.00	4.00	5.00
Blackstone Guano Co., Inc., Blackstone, Va.—			
Blackstone Raw Bone.....Total	20.00	3.60	....
Blackstone Corn Fertilizer	10.00	1.03	1.00
Pure Animal Bone.....Total	20.00	3.30	....
B. G. Co., Inc., Acid Phosphate	14.00	....	....
B. G. Co., Inc., Bone and Potash	10.00	....	4.00
B. G. Co., Inc., Bone and Potash	10.00	....	2.00
Special Compost	11.00	1.03	....
Dissolved Bone	10.00	1.03	1.00
King of Corn Fertilizer	10.00	1.03	1.00
Blackstone Special for Tobacco	9.00	2.47	3.00
Old Bellefonte	8.00	3.30	2.00
King of Tobacco Fertilizer	8.00	3.30	2.00
Tobacco Special	8.00	2.47	3.00
Prize Winner	8.00	2.47	3.00
Wrapper Brand	8.00	2.47	3.00
Jim Crow for Tobacco	8.00	2.47	3.00
Bellefonte	8.00	2.47	2.00
Prize Winner	8.00	2.47	2.00
Hard Cash	8.00	2.06	2.00
Carolina Special for Tobacco	8.00	1.65	4.00
Standard Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Red Letter for Tobacco	8.00	1.65	2.00
Alliance for Tobacco	8.00	1.65	2.00
Leader for Tobacco	8.00	1.65	2.00
Peanut Special	8.00	1.03	6.00
John L. Bailey Co., Elm City, N. C.—			
Fairmont Guano	8.00	2.47	3.00
Stag Brand Fertilizer	8.00	1.65	2.00
C. J. Burton Guano Co., Baltimore, Md.—			
Acid Phosphate	14.00	....	....
High Grade Tobacco	8.00	3.29	4.00
Burton's Best	8.00	2.47	3.00
Burton's High Grade	8.00	2.06	3.00
Burton's Butcher Bone	8.00	1.65	2.00
Tobacco Queen	8.00	2.47	3.00
Bradley Fertilizer Co., Charleston, S. C.—			
High Grade Bradley's Dissolved Phosphate	16.00	....	....
High Grade Bradley's Acid Phosphate	14.00	....	....
High Grade Bradley's Potash Acid Phosphate,	10.00	....	4.00
High Grade Bradley's Circle Guano	8.60	3.29	4.00
High Grade Bradley's Guano	8.00	2.46	3.00
Standard Bradley's XXX Acid Phosphate	13.00	....	....
Standard Bradley's Acid Phosphate	12.00	....	....
Standard Bradley's Palmetto Acid Phosphate,	12.00	....	....
Standard Bradley's Wheat Grower	10.00	....	2.00
Standard Bradley's Bone and Potash	10.00	....	2.00
Standard Bradley's Ammoniated Dissolved Bone	9.00	1.85	1.00
Standard Bradley's Patent Superphosphate	9.00	1.85	1.00
Standard Bradley's Cereal Guano	8.00	1.65	2.00
Standard Bradley's X Guano	8.00	1.65	2.00
Standard B. D. Sea Fowl Guano	9.00	1.85	1.00
Standard Eagle Ammoniated Bone Superphosphate	9.00	1.85	1.00
German Kainit	....	....	12.00
The Bryant Fertilizer Co., Alexandria, Va.—			
Bryant's Fine Ground Raw Bone.....Total	22.50	3.70	....
Bryant's S. C. Dissolved Bone	14.00	....	....
Bryant's Bone and Potash Mixture	10.00	....	2.00
Bryant's Bone Mixture for Tobacco	9.00	2.06	2.00
Bryant's "Challenge" Highest Grade Tobacco Mixture	9.00	2.47	3.00
Bryant's "Victor" Tobacco Fertilizer	8.00	2.47	3.00
Bryant's "Otter" Special Tobacco Fertilizer	8.00	2.06	3.00
Bryant's "Potomac" Bone Special for Tobacco,	8.00	1.65	2.00
The Berkley Chemical Co., Norfolk, Va.—			
Pure Ground Bone.....Total	20.00	3.70	....
Resolute Acid Phosphate	16.00	....	....
Berkley Acid Phosphate	14.00	....	....
Berkley Bone and Potash Mixture	11.00	....	2.00
Berkley Plant Food	10.00	....	4.00
Berkley Tobacco Guano	8.00	2.47	3.00
Laurel Potash Mixture	10.00	....	2.00
Monitor Animal Bone Fertilizer	9.00	1.85	4.00
Advance Crop Grower	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Select Crop Grower	8.00	2.06	2.50
Brandon Superphosphate	8.00	1.65	2.00
Long Leaf Tobacco Grower	8.00	1.65	2.00
Berkley Peanut and Grain Grower	8.00	1.00	4.00
Superior Bone and Potash	8.00	....	4.00
Mascot Truck Guano	7.00	4.12	5.00
Victory Special Crop Grower	7.00	3.29	4.00
Royal Truck Grower	6.00	5.76	5.00
The Leader of the World	5.00	3.29	5.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Bragaw Fertilizer Co., Washington, N. C.—			
Palmetto Acid Phosphate	14.00	....	....
Long Acre Bone Phosphate	14.00	....	....
Farmers' Union Meal Mixture	9.00	2.26	2.00
Beaufort County Guano	8.00	2.47	3.00
Havana Tobacco Guano	8.00	2.47	3.00
Tuckahoe Tobacco Guano	8.00	2.06	3.00
Old Reliable Premium Guano	8.00	1.65	2.00
Tar Heel Guano	8.00	1.65	2.00
Pamlico Trucker	7.00	4.12	8.00
Riverview Potato Grower	6.00	5.76	5.00
Chocowinity Special Tobacco Guano	5.00	3.29	6.00
Sunrise Tobacco Guano	4.00	2.47	5.00
Genuine German Kainit	....	....	12.00
Conestee Chemical Co., Wilmington, N. C.—			
Conestee 16 Per Cent Acid Phosphate	16.00	....	....
Conestee High Grade Acid Phosphate	14.00	....	....
Conestee High Grade Guano	6.00	4.95	8.00
Conestee Acid Phosphate	13.00	....	....
Conestee Bone and Potash	11.00	....	2.00
Conestee Bone and Potash	10.00	....	2.00
Conestee Bone and Potash	10.00	....	3.00
Conestee Bone and Potash	10.00	....	4.00
Conestee Bone and Potash	8.00	....	4.00
Conestee Cotton Guano	9.00	2.27	2.00
Conestee Cotton Grower	9.00	2.26	2.00
Conestee Melon Grower	8.00	4.22	7.00
Conestee Melon Grower	8.00	4.12	7.00
Conestee P. D. Q. Fertilizer	8.00	3.30	4.00
Conestee P. D. Q. Fertilizer for Tobacco	8.00	3.29	4.00
Conestee Special Fertilizer for Tobacco	8.00	2.47	3.00
Conestee Fertilizer for Tobacco	8.00	2.47	2.50
Conestee Fertilizer	8.00	2.47	2.50
Conestee Crop Guano	8.00	2.06	3.00
Conestee Tobacco Grower	8.00	2.06	3.00
Conestee Complete Fertilizer	8.00	2.06	2.00
Conestee Complete Fertilizer	8.00	2.06	2.00
Conestee Standard Guano	8.00	1.65	2.00
Conestee Root Crop Guano	7.00	4.10	7.00
Conestee Truck Grower	6.00	3.30	8.00
Conestee Corn Guano	6.00	2.47	3.00
Conestee Pure German Kainit	....	....	12.00
Nitrate of Soda	....	15.05	....
Conestee Top Dresser	....	7.41	3.00
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
E. W. Browley, Mooresville, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Leo	8.00	2.47	3.00
16 Per Cent Dried Blood	....	13.17	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Columbia Guano Co., Norfolk, Va.—			
Pure Raw Bone Meal.....Total	21.50	3.71	....
Columbia High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Columbia 14 Per Cent Acid Phosphate	14.00	....	....
Columbia Dissolved Bone	13.00	....	....
Columbia Acid Phosphate	12.00	....	....
Columbia 11 and 5 Bone and Potash Mixture	11.00	....	5.00
Columbia 10-5 Bone and Potash Mixture	10.00	....	5.00
Columbia 10 and 4 Bone and Potash Mixture	10.00	....	4.00
Columbia Bone and Potash for Grain	10.00	....	3.00
Columbia Bone and Potash Mixture	10.00	....	2.00
Columbia C. S. M. Special	9.00	2.27	2.00
Columbia Special Truck Guano	8.00	3.30	4.00
Columbia Special 4-8-3	8.00	3.30	3.00
Columbia Special Tobacco Guano	8.00	2.06	2.00
Columbia Special Wheat Fertilizer	8.00	1.65	2.00
Columbia Soluble Guano	8.00	1.65	2.00
Columbia 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Columbia Special 7 Per Cent Truck Guano	7.00	5.77	7.00
Columbia Potato Guano	7.00	4.12	5.00
Columbia Top Dresser	....	7.42	3.00
McRae's Special	9.00	4.12	7.00
McRae's High Grade Guano	8.00	3.30	7.00
Pelican Ammoniated Guano	9.00	3.30	4.00
Roanoke Ammoniated Guano	9.00	1.65	3.00
Carolina Soluble Guano	9.00	1.65	1.00
Trojan Tobacco Guano	8.00	3.30	4.00
Hayes' Special	8.00	3.30	3.00
Olympia Cotton Guano	8.00	2.47	3.00
Hyco Tobacco Guano	8.00	2.47	3.00
Our Best Meal Guano	8.00	2.47	3.00
Spinola Peanut Grower	8.00	1.02	4.00
Crown Brand Peanut Guano	7.00	....	5.00
Crew's Special	5.85	4.49	10.00
Nitrate of Soda	....	15.22	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Cumberland Bone and Phosphate Co., Portland, Me., and Charleston, S. C.—			
Standard Cumberland Bone and Superphosphate of Lime	9.00	1.85	1.00
The Coe-Mortimer Co., Charleston, S. C.—			
Thomas Phosphate Ex. S.S. Richmond Total	18.00	....	....
Maltassa Guano .....Total	4.40	5.26	3.80
Imported Ground Fish Guano, No. 3	2.00	9.03	....
Imported Ground Fish Guano, No. 2	2.00	8.46	....
Imported Ground Fish Guano, No. 1	2.00	8.23	....
High Grade Tankage	2.00	8.22	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate of Soda	....	14.76	....
Dried Blood, No. 3	....	14.19	....
Dried Blood, No. 2	....	13.57	....
Dried Blood, No. 1	....	13.16	....
Nitrate Potash	....	12.30	44.00
Muriate of Potash	....	....	56.00
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Muriate Mixture	....	....	20.00
Genuine German Kainit	....	....	12.00
Combahee Fertilizer Co., Charleston, S. C.—			
Dissolved Bone 16 Per Cent	16.00	....	....
Dissolved Bone 14 Per Cent	14.00	....	....
Dissolved Bone 13 Per Cent	13.00	....	....
K. M. S	8.00	3.30	4.00
King Cotton	8.00	2.47	4.00
H. G. Cotton	8.00	2.47	3.00
H. G. Cotton	8.00	1.67	2.00
Nitrate of Soda	....	14.83	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Calder Bros., Wilmington, N. C.—			
Nitrate of Soda	....	14.80	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Craven Chemical Co., New Bern, N. C.—			
Jewel Acid Phosphate	14.00	....	....
Trent Bone and Potash	10.00	....	2.00
Halifax Guano	9.00	2.47	3.00
Prolix 9-2-3, Special Guano	9.00	1.65	3.00
Hanover Standard Guano	8.00	3.29	4.00
Duplin Tobacco Guano	8.00	2.47	3.00
Gaston High Grade Fertilizer	8.00	2.47	3.00
C. E. Foy High Grade Guano	8.00	2.47	3.00
Marvel Great Crop Grower	8.00	2.06	3.00
Elite Cotton Guano	8.00	1.65	2.00
Pantego Potato Guano	7.00	4.12	7.00
Neuse Truck Grower	6.00	4.94	6.00
Craven Chemical Co.'s Truck Guano, 5-10-2½	5.00	8.24	2.50
Genuine German Kainit	....	....	12.00
William H. Camp, Petersburg, Va.—			
Camp's Shepherd Brand Bone and Potash	10.00	....	4.00
Camp's Yellow Head Chemicals	8.00	2.87	7.50
Camp's Special for Tobacco	8.00	2.46	3.00
Camp's Red Head Chemicals	8.00	2.25	2.00
Camp's Green Head Chemicals, Irish Potato	7.00	6.15	10.00
Lion and Monkey, 8-2-2	8.00	1.65	2.00
Clayton Oil Mill, Clayton, N. C.—			
C. O. M. 16 Per Cent Acid Phosphate	16.00	....	....
C. O. M. 14 Per Cent Acid Phosphate	14.00	....	....
C. O. M. Special Corn Mixture	10.00	....	5.00
C. O. M. Bone and Potash	12.00	....	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
C. O. M. Wheat Compound	10.00	2.06	4.50
C. O. M. German Kainit	....	....	12.00
C. W. H. Special	8.00	4.13	5.00
Clayton Guano	8.00	2.47	3.00
Clayton Special Tobacco Grower	8.00	2.47	3.00
Clayton Oil Mill C. O. M. Planters' Favorite,	8.00	2.47	3.00
Cotton Queen	8.00	1.65	2.00
Summer Queen	8.00	1.65	2.00
Cowell, Swan & McCotter Co., Bayboro, N. C.—			
Bone Phosphate	14.00	....	....
Standard Cotton Grower	8.00	3.30	3.00
Champion Guano	8.00	2.47	3.00
Champion Guano	8.00	2.47	3.00
Cowell's Great Tobacco Grower	8.00	2.47	3.00
Quick Grower Guano	8.00	2.06	3.00
Rust Proof Cotton Guano	8.00	1.65	3.00
Crop Guano	8.00	1.65	2.00
Great Cabbage and Potato Guano	7.00	5.77	7.60
Oriental Trucker	7.00	4.12	8.00
Aurora Trucker	7.00	4.12	7.00
High Grade Truck Guano	7.00	4.12	5.00
Potato Favorite Guano	7.00	3.30	7.00
Cowell, Swan & McCotter Co.'s Cabbage Guano,	5.00	8.25	2.50
German Kainit	....	....	12.00
Chickamauga Fertilizer Works, Atlanta, Ga.—			
Chickamauga High Grade Dissolved Bone, No. 16	16.00	....	....
Chickamauga High Grade Dissolved Bone	14.00	....	....
Chickamauga High Grade Fertilizer	10.00	1.65	2.00
Chickamauga High Grade Plant Food	10.00	1.65	2.00
Chickamauga 13-4	13.00	....	4.00
Chickamauga Potash Special, No. 4	12.00	....	4.00
Chickamauga Potash Special	12.00	....	2.00
Chickamauga Dissolved Bone	12.00	....	....
Chickamauga Very Best	10.00	3.30	4.00
Chickamauga Fish Scrap Guano	10.00	1.65	2.00
Chickamauga Wheat Special	10.00	.82	3.00
Chickamauga Corn Special	10.00	.82	3.00
Chickamauga Wheat and Corn Grower, No. 6.	10.00	....	6.00
Chickamauga Wheat and Corn Grower, No. 5.	10.00	....	5.00
Chickamauga Wheat and Corn Grower	10.00	....	4.00
Chickamauga Bone and Potash	10.00	....	2.00
Chickamauga Blood, Bone and Tankage Guano,	9.00	.82	2.00
Chickamauga Complete Fertilizer	8.00	1.65	2.00
Chickamauga Standard Corn Grower	8.00	1.65	2.00
Chickamauga Standard Wheat Grower	8.00	1.65	2.00
Chickamauga Alkaline Bone, No. 6	8.00	....	6.00
Chickamauga Alkaline Bone, No. 5	8.00	....	5.00
Ben Hur H. G. Guano	10.00	2.47	3.00
Old Glory Mixture	10.00	.82	1.00
Special Wheat Compound	10.00	1.65	4.00
Special Wheat Grower	8.00	1.65	6.00
Special Vegetable Compound	10.00	1.65	4.00
Special Vegetable Grower	8.00	1.65	6.00
Special Corn Compound	10.00	1.65	4.00
Special Corn Grower	8.00	1.65	6.00
Georgia Home Guano	8.00	1.65	2.00
No. 3 Bone, Tankage and Potash Mixture	8.00	.82	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Cumbahee Fertilizer Co., Charleston, S. C.—			
Melon Fertilizer	10.00	3.30	5.00
Canteloupe Fertilizer	10.00	2.46	10.00
Nitrate of Soda	....	14.83	....
Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Climax Dissolved Bone	14.00	....	....
Sterling Acid Phosphate	13.00	....	....
Stable Acid Phosphate	12.00	....	....
Horne & Son's High Grade Bone and Potash	11.00	....	5.00
Special Bone and Potash Mixture	10.00	....	4.00
Morris & Scarboro's Special Bone and Potash	10.00	....	3.00
Electric Bone and Potash Mixture	10.00	....	2.00
Pacific Tobacco and Cotton Grower	9.00	2.26	2.00
Horne's Best	8.00	2.47	3.00
Eclipse Ammoniated Guano	8.00	2.47	2.00
Planters' Pride	8.00	2.06	3.00
Caraleigh Special Tobacco Guano	8.00	2.06	3.00
Ely Ammoniated Fertilizer	8.00	1.65	2.00
Crown Ammoniated Guano	8.00	1.65	2.00
Comet Guano	8.00	.82	3.00
Buncombe Wheat Grower	8.00	....	4.00
Buncombe Corn Grower	8.00	....	4.00
Caraleigh Top Dresser	3.00	8.24	4.00
Nitrate of Soda	....	15.65	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
W. B. Cooper, Wilmington, N. C.—			
Nitrate of Soda	....	15.76	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Contentnea Guano Co., Wilson, N. C.—			
Contentnea 16 Per Cent Acid	16.00	....	....
High Grade 14 Per Cent Acid	14.00	....	....
Bone and Potash Mixture	10.00	....	4.00
Special Formula Fertilizer	9.00	2.06	5.00
Special Formula	8.00	2.47	6.00
Special Formula 8-4-5	8.00	3.29	5.00
Special Formula for Tobacco	8.00	3.28	7.00
Special Formula Fertilizer	8.00	3.29	4.00
Special Formula for Tobacco	8.00	2.88	5.00
Special Tobacco Formula	8.00	2.06	6.00
Special Formula for Cotton	7.00	2.47	3.25
8-4½-7 for Tobacco	8.00	3.70	7.00
8-4½-7 for Cotton	8.00	3.70	7.00
Howard & Williams' Cotton Special	8.00	2.47	5.00
Pick Leaf	8.00	2.47	3.00
Top Notch	8.00	2.47	3.00
Contentnea Cotton Grower	8.00	2.47	2.50
Contentnea Corn Special	5.00	1.65	5.00
Contentnea Top Dresser	3.00	8.23	5.00
Blood and Bone Cotton Compound	8.00	1.65	2.00
Howard & Williams' Tobacco Special	8.00	2.90	5.00
Whitehead Farm Cotton Grower	6.00	2.47	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	50.00
German Kainit	....	....	12.00
Dunn Oil Mills Co., Dunn, N. C.—			
Dunn Oil Mills Hustler	8.00	2.47	3.00
Sampson Cotton Grower	8.00	1.65	2.00
C. P. Dey, Beaufort, N. C.—			
Ground Fish Scrap	6.00	9.37	....
Dixie Guano Co., Savannah, Ga.—			
High Grade	10.00	1.85	2.75
High Grade	8.00	3.30	4.00
Phosphoric Acid	16.00	....	....
Phosphoric Acid	14.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
Bone and Potash	8.00	....	4.00
Blood and Bone	9.00	1.64	3.00
Blood, Bone and Potash	8.75	1.64	2.00
Farmers' Favorite H. G. Fertilizer	8.00	2.47	3.00
Standard Grade Fertilizer	8.00	1.64	4.00
Standard Grade	8.00	1.64	2.00
Beats All	9.00	1.64	2.00
Dixie Guano Co., Durham, N. C.—			
Dixie 16 Per Cent Acid Phosphate	16.00	....	....
Dixie 14 Per Cent Acid Phosphate	14.00	....	....
Dixie Champion for Wheat and Corn	10.50	....	1.50
Dixie Star Ammoniated	9.00	1.65	1.00
Dixie Corn Fertilizer	9.00	.82	3.00
Dixie Tobacco Fertilizer	8.00	2.46	3.00
Dixie Cotton Fertilizer	8.00	1.65	2.00
Jeff Davis Special	9.00	2.26	2.00
Radium Brand Guano	8.00	3.28	5.00
Carolina Special Ammoniated	8.00	2.46	3.00
Sulky Plow Brand Guano	8.00	2.46	2.00
Battle's Blood and Bone Fertilizer	8.00	2.05	3.00
Niagara Soluble Bone	8.00	2.05	2.00
Old Plantation Superphosphate	8.00	1.65	2.00
J. L. Everett, Rockingham, N. C.—			
Hard Salts	....	....	16.00
Etiwan Fertilizer Co., Charleston, S. C.—			
Etiwan 16 Per Cent Acid Phosphate	16.00	....	....
Etiwan High Grade Acid Phosphate	14.00	....	....
Etiwan Dissolved Bone	13.00	....	....
Etiwan Acid Phosphate with Potash	11.00	....	1.00
Etiwan Potash Bone	10.00	....	4.00
Etiwan Soluble Bone with Potash	10.00	....	3.00
Etiwan Blood and Bone Guano	9.00	2.06	1.00
Etiwan 9-2-3 Per Cent Ammoniated Fertilizer,	9.00	1.65	3.00
Etiwan Superior Cotton Fertilizer	8.00	3.30	6.00
Etiwan Special Cotton Fertilizer	8.00	3.30	4.00
Etiwan Cotton Compound	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Etiwan High Grade Cotton Fertilizer	8.00	2.47	2.00
Etiwan Ammoniated Fertilizer	8.00	1.65	2.00
Etiwan Special Potash Mixture	8.00	....	4.00
Diamond Soluble Bone	13.00	....	....
Plow Brand Acid Phosphate with Potash	11.00	....	1.00
Plow Brand Raw Bone Superphosphate	9.00	2.06	1.00
Plow Brand Special Tobacco Fertilizer	8.00	3.30	4.00
Plow Brand Ammoniated Fertilizer	8.00	1.65	2.00
Diamond Soluble Bone with Potash	10.00	....	2.00
XX Acid Phosphate with Potash	10.00	....	2.00
Special for Cotton	9.00	2.47	7.00
Special Formula for Tobacco	8.00	2.47	5.00
Special Formula	7.00	2.05	6.00
Genuine German Kainit	....	....	12.00
Eastern Cotton Oil Co., Hertford, N. C.—			
Acid Phosphate	16.00	....	....
Mat White Special	8.00	3.30	4.00
Rain-proof Cotton Grower	8.00	2.47	2.00
Perquimans Favorite	8.00	1.65	2.00
Nun-Such Potato Grower	6.00	4.12	7.00
Genuine German Kainit	....	....	12.00
Farmers' Fertilizer Co., Spartanburg, S. C.—			
Phosphoric Acid	16.00	....	....
Phosphoric Acid	14.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
High Grade	10.00	3.30	4.00
High Grade	10.00	1.85	2.75
High Grade	10.00	1.65	2.00
High Grade	8.00	3.30	4.00
Beats All 9-2-2	9.00	1.64	2.00
Blood and Bone	9.00	1.64	3.00
Blood, Bone and Potash	8.75	1.64	2.00
Farmers' Favorite H. G. Fertilizer	8.00	2.47	3.00
Standard Grade Fertilizer	8.00	1.64	4.00
Standard Grade	8.00	1.64	2.00
Bone and Potash	8.00	....	4.00
Farmers Guano Co., Raleigh, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Farmers' Acid Phosphate	13.00	....	....
Farmers' Formula	7.00	2.47	3.25
Farmers' Top Dresser	3.00	8.24	4.00
Special Bone and Potash Mixture	10.00	....	4.00
Century Bone and Potash Mixture	10.00	....	2.00
Golden Grade Guano	8.00	2.47	3.00
Big Crop Guano	8.00	2.06	3.00
Toco Tobacco Guano	8.00	2.06	3.00
State Standard Guano	8.00	1.65	2.00
Special Bone and Potash	8.00	....	4.00
Nitrate of Soda	....	15.65	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Floradora Guano Co., Laurinburg, N. C.—			
Rocky Ford	10.00	2.47	7.00
Humus	10.00	3.29	5.00
Florena	8.00	3.29	4.00
Floradora	8.00	3.29	4.00
Oceola	8.00	2.47	3.00
Rob Roy	8.00	2.47	3.00
Red Raven	8.00	1.65	3.00
Scotland Special	6.40	2.13	3.00
Fremont Oil Mills, Fremont, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Carolina C. S. M. Compound	9.00	2.26	2.00
Fomco	8.00	3.29	4.00
Fremont H. G. Guano	8.00	3.29	4.00
Fremont Oil Mill Co.'s Special for Tobacco	8.00	2.47	5.00
Fremont Tobacco Guano	8.00	2.47	5.00
Fremont Standard Fertilizer	8.00	2.47	3.00
Y. & W. Tobacco Special	8.00	2.47	5.00
Wayne County Standard	8.00	2.47	3.00
Square Deal	8.00	2.47	3.00
Nahunta Special	8.00	2.47	3.00
A. A. Special Formula	8.00	2.06	3.00
Up-to-date	8.00	1.65	2.00
Home Run	8.00	1.65	2.00
Y. & W. Cotton Compound	8.00	1.65	2.00
Nitrate of Soda	....	14.85	....
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
Farmers Cotton Oil Co., Wilson, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Bonum Acid Phosphate	14.00	....	....
Contentnea Acid Phosphate	13.00	....	....
Washington's Corn Mixture Guano	10.00	.82	5.00
Xtra Good Bone and Potash	10.00	....	2.00
Dean's Special Guano	8.00	3.70	7.00
Regal Tobacco Guano	8.00	2.88	5.00
Newsome's Tobacco Special	8.00	2.47	4.00
J. D. Farrior's Special Guano	8.00	2.47	3.00
Graves' Cotton Grower Guano	8.00	2.47	3.00
Golden Gem Guano	8.00	2.47	3.00
Wilson High Grade Guano	8.00	2.27	2.00
Planters' Friend Guano	8.00	2.06	3.00
Carolina Choice Tobacco Guano	8.00	2.06	3.00
Crop King Guano	8.00	1.65	2.00
Farmers' Special Guano	8.00	1.65	2.00
Rogers' Truck Grower	7.00	5.76	7.00
Wilson Top Dresser	2.00	9.05	4.00
Perfect Top Dresser	2.00	8.23	5.00
Sulphate of Ammonia	....	20.57	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Franklin Cotton Oil and Fertilizer Co., Inc., Franklin, Va.—			
Pretlow & Co.'s H. G. Acid Phosphate	16.00	....	....
Pretlow & Co.'s H. G. Truck Fertilizer	8.00	4.12	5.00
Pretlow & Co.'s Cotton-seed Meal Mixture	8.00	2.47	3.00
Pretlow & Co.'s Champion Guano	8.00	1.65	2.00
Pretlow & Co.'s Peanut Grower	8.00	1.00	4.00
Pretlow & Co.'s Genuine German Kainit	....	....	12.00
Griffith & Boyd Co., Baltimore, Md.—			
High Grade Acid Phosphate	14.00	....	....
Ammoniated Bone Phosphate	8.00	1.65	2.00
Spring Crop Grower	6.50	1.65	4.50
Seven Per Cent Guano	5.00	5.77	5.00
Netro Crop Feeder	....	7.40	2.50
Genuine German Kainit	....	....	12.00
Germofert Manufacturing Co., Charleston, S. C.—			
Germofert Patented Standard Cotton Grower.	8.00	1.65	2.00
Germofert Patented Special Cotton Grower.	6.00	2.47	3.00
Germofert Patented Extra Special Cotton Grower	4.00	3.29	4.00
Germofert Patented Tobacco Grower	2.00	3.29	6.00
R. C. Gilliam, Norfolk, Va.—			
Gilliam's 7 Per Cent Potato Guano	6.00	5.76	7.00
Gilliam's Special Potato Guano	6.00	5.76	6.00
German Kali Works, New York, N. Y.—			
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00
Home Fertilizer and Chemical Co., Baltimore, Md.—			
Champion Dissolved Phosphate	16.00	....	....
Home High Grade Acid Phosphate	14.00	....	....
Home Bone and Potash	10.00	....	5.00
Home Alkaline Bone	10.00	....	2.00
Home Ammoniated Bone	9.00	1.65	3.00
Home B. G. Ammoniated Compound	9.00	.82	5.00
Home Standard Guano	8.00	4.12	6.00
Home Potato Special	8.00	1.65	10.00
Home Vegetable Fertilizer	6.00	4.12	6.00
Home Potato Grower	6.00	3.30	4.00
Home Fertilizer	....	5.77	7.00
Boykin's Dissolved Animal Bone	12.00	1.65	....
Everybody's Fertilizer	9.00	.82	2.00
Special C. & C. Compound	8.00	2.48	3.00
Zancey's Formula for Yellow Leaf Tobacco	8.00	2.48	2.00
Phœnix Crop Grower	8.00	2.48	2.00
Matchless Guano	8.00	1.65	4.00
Boykin's Cereal Fertilizer	8.00	1.65	2.00
Ammoniated Bone Manure	7.00	1.65	5.00
Farmers' Choice	7.00	.82	4.00
Truckers' Special Compound	6.00	5.77	5.00
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	48.00

Name and Address of Manufacturer and Name of Brand	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate of Soda	....	15.27	....
Cerealite Top Dresser	....	7.43	3.00
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Hadley, Harris & Co., Wilson, N. C.—			
Hadley's Special 8-4½-7 Mixture	8.00	3.70	7.00
Hadley's Tobacco and Cotton Special	8.00	2.47	5.00
Hadley Boss Guano	8.00	2.26	2.50
Golden Weed Tobacco Grower	8.00	2.47	3.00
Daisy Fish Mixture	8.00	1.65	2.00
Top Dressing	2.00	8.23	5.00
Nitrate of Soda	....	15.60	....
German Kainit	....	....	12.00
Hampton Guano Co., Norfolk, Va.—			
Pure Ground Bone	20.00	3.70	....
Supreme Acid Phosphate	16.00	....	....
Hampton Acid Phosphate	14.00	....	....
Hampton Bone and Potash Mixture	11.00	....	2.00
Hampton Crop Grower	10.00	....	4.00
Hampton Tobacco Guano	8.00	2.47	3.00
Hampton Special Grain and Peanut Fertilizer,	8.00	1.00	4.00
Dauntless Potash Mixture	10.00	....	2.00
Arlington Animal Bone Fertilizer	9.00	1.85	4.00
Alpha Crop Grower	8.50	2.06	2.50
P. P. P. (Princess Prolific Producer)	8.00	2.47	3.00
Extra Tobacco Guano	8.00	1.65	2.00
Shirley's Superphosphate	8.00	1.65	2.00
Excelsior Bone and Potash	8.00	....	4.00
Reliance Truck Guano	7.00	4.11	5.00
Little's Favorite Crop Grower	7.00	3.29	4.00
Virginia Truck Grower	6.00	5.76	5.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
S. B. Harrell & Co., Inc., Norfolk, Va.—			
Harrell's Acid Phosphate	14.00	....	....
Harrell's Eclipse	9.00	2.26	2.00
Harrell's Champion Cotton and Peanut Grower,	8.00	1.65	2.00
Harrell's Truck Guano	6.00	5.76	5.00
M. P. Hubbard & Co., Baltimore, Md.—			
Hubbard's Soluble S. C. Phosphate	16.00	....	....
Hubbard's Havana Special for Tobacco	8.00	2.48	3.00
Hubbard's Celebrated Phosphate for General Use	8.00	1.66	2.00
Hubbard's Cannon Ball	7.00	5.74	7.00
Hubbard's Maryland Special Vegetable Grower,	7.00	4.13	5.00
Hubbard's Special Cotton and Corn Fertilizer,	7.00	1.65	5.00
Hubbard's 7 Per Cent Bermuda Guano	6.00	5.78	5.00
Nitrate of Soda	....	15.60	....
Ground Fish	....	8.25	....
Muriate of Potash	....	....	50.00
The Hubbard Fertilizer Co., Baltimore, Md.—			
Hubbard's 14 Per Cent Phosphate	14.00	....	....
Hubbard's Special Mixture	10.00	....	4.00
Hubbard's B. and P. Phosphate	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Hubbard's Blood, Bone and Potash	8.00	3.32	7.00
Hubbard's Noxall	8.00	3.32	4.00
Hubbard's Royal Ensign	8.00	2.49	4.00
Hubbard's Yellow Wrapper	8.00	2.49	3.00
Hubbard's Fish Compound	8.00	1.65	3.00
Hubbard's Exchange Guano	8.00	1.65	2.00
Hubbard's Cannon Ball	7.00	5.74	7.00
Hubbard's Southern Leader	7.00	3.32	5.00
Hubbard's 5 Per Cent Royal Seal	6.00	4.15	5.00
Hubbard's New Process Top Dresser	....	7.60	3.00
Hubbard's Pure German Kainit	....	....	12.00
L. Harvey & Son Co., Kinston, N. C.—			
Nitrate of Soda	....	15.00	....
Harby & Co., Sumter, S. C.—			
Nitrate of Soda	....	14.84	....
Muriate of Potash	....	....	48.00
German Kainit	....	....	12.00
Interstate Chemical Co., Charleston, S. C.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Acid Phosphate with Potash	11.00	....	1.00
Acid Phosphate with Potash	10.00	....	4.00
Acid Phosphate with Potash	10.00	....	2.00
Acid Phosphate with Potash	8.00	....	4.00
Complete Fertilizer	9.00	2.06	1.00
Favorite Crop Grower	9.00	1.65	2.00
H. G. Ammoniated Fertilizer	8.00	3.30	4.00
Planters' Preference Guano	8.00	2.47	3.00
Challenge Brand Guano	8.00	2.06	2.00
Ammoniated Guano	8.00	1.64	2.00
Nitrate of Soda	....	14.80	....
Muriate of Potash	....	....	49.00
German Kainit	....	....	12.00
The Imperial Co., Norfolk, Va.—			
Imperial 17 Per Cent Acid Phosphate	17.00	....	....
Imperial H. G. Tennessee Acid Phosphate	16.00	....	....
Imperial High Grade Acid Phosphate	14.00	....	....
Imperial Catawba Wheat Grower	10.00	....	4.00
Imperial Carolina Wheat Mixture	10.00	....	3.00
Imperial Virginia Grain Mixture	10.00	....	2.00
Imperial Bone and Potash	10.00	....	2.00
Imperial Martin County Special Crop Grower	9.00	2.26	2.00
Imperial Snowflake Cotton Grower	8.00	3.29	4.00
Imperial Tobacco Grower	8.00	3.29	4.00
Imperial Tobacco Grower	8.00	3.29	4.00
Imperial X. L. O. Cotton Guano	8.00	2.47	3.00
Imperial Tobacco Guano	8.00	2.47	3.00
Imperial Yellow Bark Sweet Potato Guano	8.00	2.47	3.00
Imperial F. and B. Cotton Guano	8.00	2.06	3.00
Imperial Bright Tobacco Guano	8.00	2.06	3.00
Imperial Peanut Guano	8.00	1.65	4.00
Imperial Tennessee Tobacco Guano	8.00	1.65	8.00
Imperial Cotton Grower	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Imperial Peanut and Corn Guano	8.00	1.65	2.00
Imperial Champion Guano	8.00	1.65	2.00
Imperial Cisco Soluble Guano	8.00	1.65	2.00
Imperial Standard Premium	8.00	1.65	2.00
Imperial Fish and Bone Grain Grower	8.00	.82	4.00
Imperial Yadkin Wheat Grower	8.00	....	4.00
Imperial 7—7—7 Potato Guano	7.00	5.76	7.00
Imperial High Grade Irish Potato Guano	7.00	4.11	8.00
Imperial Dawson's Cotton Grower	7.00	2.67	2.75
Imperial Roanoke Crop Grower	7.00	2.47	2.00
Imperial Asparagus Mixture	6.00	4.94	7.00
Imperial 5—6—7 Potato Guano	6.00	4.11	7.00
Imperial Williams' Special Potato Guano	6.00	4.11	5.00
Imperial Fish and Bone	6.00	3.29	4.00
Imperial Sweet Potato Guano	6.00	1.65	6.00
Imperial 10 Per Cent Guano	5.00	8.23	2.50
Imperial Special 7 Per Cent for Potatoes	5.00	5.76	5.00
Imperial Special Tobacco Guano	5.00	3.29	9.00
Imperial Laughinghouse Special Tobacco Guano	4.00	3.29	6.00
Imperial Conetoe Cotton Grower	4.00	3.29	4.00
Imperial Cubanola Tobacco Guano	4.00	2.47	5.00
Imperial Top Dresser for Cotton	2.00	8.23	....
Imperial Nitrate of Soda	....	15.00	....
Imperial Muriate of Potash	....	....	49.00
Imperial Manure Salt	....	....	20.00
Imperial Genuine German Kainit	....	....	12.00
R. L. Kirkwood, Bennettsville, S. C.—			
Hard Salts	....	....	16.00
Lister's Agricultural Chemical Works, Newark, N. J.—			
Lister's Standard Pure Bone Superphosphate of Lime	9.00	1.65	2.00
Lister's Ammoniated Dissolved Bone Phosphate	8.00	2.06	2.00
Lister's Success Fertilizer	8.00	1.65	2.00
A. S. Lee & Sons Co. (Inc.), Richmond, Va.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Lee's Special Wheat Fertilizer	10.00	....	2.00
Lee's H. G. Bone and Potash	9.00	....	4.00
Lee's Natural Tobacco Grower	8.00	1.64	2.00
John F. McNair, Lauriuburg, N. C.—			
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
E. H. & J. A. Meadows Co., New Bern, N. C.—			
Meadows' Diamond Acid Phosphate	14.00	....	....
Meadows' Dissolved Bone and Potash Compound	10.00	....	2.00
Meadows' Lobos Guano	8.00	4.11	5.00
Meadows' Ideal Tobacco Guano	8.00	3.29	4.00
Meadows' Gold Leaf Tobacco Guano	8.00	2.47	3.00
Meadows' Roanoke Guano	8.00	2.05	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid	Nitrogen.	Potash.
Meadows' All Crop Guano	8.00	2.05	2.50
Meadows' Cotton Guano	8.00	1.64	2.00
Meadows' Great Cabbage Guano	7.00	5.76	7.00
Meadows' Great Potato Guano	7.00	4.11	8.00
Meadows' 10 Per Cent Guano	6.00	8.23	2.50
Meadows' German Kainit	....	....	12.00
Diamond Acid Phosphate	16.00	....	....
Brooks' Special Tobacco Grower	8.00	2.47	5.00
Parker's Special Tobacco Guano	8.00	2.47	4.00
Dixon's High Grade Tobacco Guano	8.00	2.47	3.00
Hookerton Cotton Guano	8.00	1.64	2.00
The Miller Fertilizer Co., Baltimore, Md.—			
Miller's 16 Per Cent Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Corn and Peanut Grower	10.50	....	2.25
The Miller Fertilizer Co.'s 10 and 4 Per Cent,	10.00	....	4.00
Clinch	10.00	....	2.00
Trucker	8.00	4.12	5.00
No. 1 Potato and Vegetable Grower	8.00	3.71	7.00
Miller's Irish Potato	8.00	3.29	4.00
4 Per Cent Tobacco	8.00	3.29	4.00
Everett's Special Cotton Grower	8.00	3.29	4.00
Standard Phosphate	8.00	2.47	3.00
Standard Potato	8.00	2.47	3.00
Tobacco King	8.00	2.47	3.00
Harmony	8.00	2.06	3.00
Special Tobacco Grower	8.00	1.65	4.00
Potato and Vegetable Guano	8.00	1.65	4.00
Ammoniated Dissolved Bone	8.00	1.65	2.00
Profit	8.00	1.65	2.00
Farmers' Profit	8.00	1.65	2.00
Miller's 7 Per Cent	7.00	5.77	7.00
High Grade Potato	6.00	4.12	7.00
Nitrate of Soda	....	15.05	....
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
The Mapes Formula and Peruvian Guano Co., 143 Liberty Street, New York.—			
Mapes' Complete Manure, "A" Brand	10.00	2.47	2.50
Mapes' Corn Manure	8.00	2.47	6.00
Mapes' Vegetable or Complete Manure for Light Soils	6.00	4.94	6.00
Mapes' Economical Potato Manure	4.00	3.29	8.00
D. B. Martin Co., Richmond, Va.—			
Pure Ground Bone.....Total	22.00	2.46	....
Raw Bone Meal.....Total	21.00	3.70	....
Animal Bone Potash Compound	16.00	1.65	2.50
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Pure Dissolved Animal Bone	12.00	1.65	2.00
Pure Dissolved Animal Bone	12.00	1.64	....
Potash and Soluble Bone	12.00	....	5.00
Potash and Soluble Bone	12.00	....	3.00
Potash and Soluble Bone	10.00	....	5.00
Potash and Soluble Bone	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Martin's Tobacco Compound	9.00	2.26	2.00
Dissolved Organic Compound	9.00	1.00	2.00
Martin's H. G. Guano	8.75	2.00	2.00
Martin's H. G. Guano	8.75	1.65	2.00
Martin's Red Star Brand	8.60	3.28	4.00
Martin's Blue Ribbon Brand Fertilizer	8.00	3.28	2.00
Martin's Bull Head Fertilizer	8.00	2.46	3.00
Martin's Tobacco Special	8.00	2.46	3.00
Martin's Cotton Guano	8.00	2.06	....
Corn and Cereal Special	8.00	1.65	2.00
Martin's Carolina Cotton	8.00	1.64	2.00
Old Virginia Favorite	8.00	1.64	2.00
Martin's Special Potato Manure	8.00	1.00	5.00
One-Eight-Four	8.00	1.00	4.00
Martin's Peanut Grower	8.00	1.00	4.00
Gilt Edge Potato Manure	7.00	2.46	10.00
Claremount Vegetable Grower	7.00	2.46	5.00
Martin's Top Dresser	7.00	8.22	2.50
Martin's Animal Organic Compound	8.00	1.64	3.00
Martin's Animal Bone Potato Guano	6.00	4.10	7.00
Martin's 7 Per Cent Guano	6.00	5.74	5.00
Early Truck and Vegetable Grower	6.00	3.28	8.00
Martin's Top Dresser	5.00	8.22	2.50
Nitrate of Soda	....	15.58	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Marietta Fertilizer Co., Atlanta, Ga.—			
Langford's Special Guano	10.00	1.65	4.00
Lion Power Guano	10.00	1.65	2.00
Royal Seal Guano	10.00	1.65	2.00
Cooper's High Grade Guano	10.00	1.65	2.00
Lion H. G. Guano	10.00	1.65	2.00
Lion Crop Producer	10.00	....	4.00
Dissolved Bone and Potash	10.00	....	2.00
Marsh-Lee & Co., Marshville, N. C.—			
Marsh's Acid	16.00	....	....
Marsh's Acid	14.00	....	....
Marsh's Special High Grade	8.00	2.47	3.00
Marsh's Cotton Fertilizer	8.00	1.65	2.00
Marsh's Guano for Corn	8.00	1.65	2.00
The MacMurphy Co., Charleston, S. C.—			
H. G. Acid Phosphate	16.00	....	....
High Grade Acid Phosphate, 14 Per Cent	14.00	....	....
Acid Phosphate	13.00	....	....
Special 9-3-3 Guano	9.00	2.47	3.00
Special Cotton and Corn 8.75 2-3	8.75	1.65	2.00
Special 8-3-3 Guano	8.00	2.47	3.00
Special 8-2-2 Cotton and Corn Guano	8.00	1.65	2.00
Special 8-4-6	8.00	3.29	6.00
Special Cotton 8-4-4	8.00	3.29	4.00
Wilcox & Gibbs Co.'s Manipulated Guano	9.00	2.26	2.00
Nitrate of Soda	....	14.82	....
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
Pure German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Martin & White Co., Norfolk, Richmond and Baltimore.—			
Phosphate and Potash	12.00	....	5.00
Phosphate and Potash	12.00	....	3.00
Phosphate and Potash	10.00	....	5.00
Phosphate and Potash	10.00	....	4.00
Phosphate and Potash	10.00	....	2.00
H. G. Cotton and Tobacco Guano	8.00	3.28	4.00
Organic Cotton Grower	8.00	2.46	3.00
Special Peanut Grower	8.00	1.65	4.00
Special Seven Per Cent Trucker	6.00	5.74	5.00
Special Potato Guano	6.00	4.10	7.00
Fish Guano	8.00	1.65	3.00
Fruit Special	8.00	1.65	2.00
Big Crop Grower	8.00	1.65	2.00
Blood, Bone and Potash	7.00	4.10	8.00
Virginia Trucker	6.00	3.38	4.00
Nitrate of Soda	....	15.48	....
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
North Carolina Cotton Oil Co., Wilmington, N. C.—			
Wilmington Mortgage Lifter	9.00	2.27	2.00
Wilmington Prolific Crop Grower	9.00	2.27	2.00
Wilmington's Pride	8.00	4.12	7.00
Wilmington Truck Grower	8.00	3.30	4.00
Wilmington High Grade	8.00	2.47	3.00
Wilmington Standard	8.00	2.47	2.50
Wilmington Tobacco Grower	8.00	2.06	3.00
Wilmington Banner	8.00	1.65	3.00
Wilmington Cotton Grower	8.00	1.65	2.00
Wilmington Special	8.00	1.65	2.00
John's Special	8.00	2.47	4.00
L. P. B. Special	8.00	2.47	3.00
Lewis' Special	8.00	2.47	3.00
Carter's Lifter	8.00	2.47	3.00
Pate's Special	8.00	2.47	2.00
Clark's Special	8.00	1.65	3.00
Nitrate of Soda	....	14.82	....
North Carolina Cotton Oil Co., Raleigh, N. C.—			
Raleigh Standard Guano	8.00	2.26	2.00
North Carolina Cotton Oil Co., Charlotte, N. C.—			
Dixie Standard	8.00	2.48	3.00
Majestic	8.00	1.65	2.00
North Carolina Cotton Oil Co., Henderson, N. C.—			
Henderson Tobacco Fertilizer	9.00	2.47	3.00
Henderson Cotton Grower	8.00	1.65	2.00
Franklin Tobacco Fertilizer	9.00	2.47	3.00
Franklin Cotton Grower	8.00	1.65	2.00
Pride of Vance	9.00	2.47	3.00
Uneedit Tobacco Fertilizer	9.00	2.47	3.00
McKinne Mixture	8.00	2.26	3.25
Brewer's Special	8.00	2.26	2.00
Uneedit Cotton Grower	8.00	1.65	2.00
Vance Cotton Grower	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate Agencies Co., New York, Baltimore, Savannah, Charleston and Norfolk.—			
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Special Corn and Peanut Grower	11.00	....	2.00
High Grade Bone and Potash	10.00	....	4.00
High Grade Fish Scrap	....	8.25	....
Carteret Bone and Potash	10.00	....	2.00
Oriole Tobacco Grower	8.00	3.30	4.00
Foy's High Grade Fertilizer	8.00	2.47	3.00
Lenoir Bright Leaf Tobacco Grower	8.00	2.47	3.00
Pitt's Prolific Golden Tobacco Guano	8.00	2.47	3.00
Favorite Cotton Grower C. S. M.	8.00	2.27	2.00
Onslow Farmers' Reliance Guano	8.00	2.06	3.00
Jones County Premium Crop Grower	8.00	2.06	3.00
Craven Cotton Guano	8.00	1.65	2.00
Greene County Standard Fertilizer	8.00	1.65	2.00
Dunn's Standard Truck Grower	7.00	5.77	7.00
Ives' Irish Potato Guano	7.00	4.12	7.00
Eureka Tobacco Fertilizer	6.00	3.30	7.00
Pamlico Electric Top Dresser	5.00	8.25	2.50
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.67	....
Dried Blood	....	13.25	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Norfolk Fertilizer Co., Norfolk, Va.—			
Oriana 16 Per Cent Acid Phosphate	16.00	....	....
Oriana 14 Per Cent Acid Phosphate	14.00	....	....
Oriana Wheat Grower	10.00	....	4.00
Oriana Bone and Potash	10.00	....	2.00
Oriana C. S. M. Special	9.00	2.26	2.00
Oriana First Step Tobacco Guano	8.00	3.29	4.00
Oriana Tobacco Guano	8.00	2.47	3.00
Oriana for Cotton	8.00	2.47	3.00
Oriana Cotton Guano	8.00	1.65	2.00
Oriana Crop Grower	8.00	1.65	2.00
Oriana H. G. Tobacco Guano	6.00	3.29	4.00
Whitney High Grade Acid Phosphate	16.00	....	....
Iola Acid Phosphate	13.00	....	....
Shenandoah Wheat Mixture	10.00	....	3.00
Young's Grain Grower	10.00	....	2.00
Mayodan Valley Wheat Grower	8.00	....	4.00
Pine Top Special Crop Grower	5.00	1.65	6.00
Nitrate of Soda Mixture for Top Dressing Cotton	2.00	8.23	....
Genuine German Kainit	....	....	12.00
Navassa Guano Co., Wilmington, N. C.—			
Navassa Acid Phosphate	16.00	....	....
Navassa 14 Per Cent Acid Phosphate	14.00	....	....
Navassa Dissolved Bone	13.00	....	....
Navassa Acid Phosphate	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Navassa Special Wheat Mixture	12.00	....	4.00
Navassa Gray Land Mixture	12.00	....	4.00
Navassa Wheat Mixture	10.00	....	2.25
Navassa Wheat and Grass Grower	10.00	....	4.00
Navassa Dissolved Bone with Potash	10.00	....	2.00
Navassa Fish Guano	9.00	2.47	3.00
Navassa Manipulated Guano	9.00	2.26	2.00
Navassa Complete Fertilizer	9.00	1.65	1.00
Navassa Universal Fertilizer	8.50	2.06	1.00
Navassa Special Trucker Guano	8.00	3.30	4.00
Navassa High Grade Tobacco Guano	8.00	2.47	10.00
Navassa Carib Guano	8.00	2.47	10.00
Navassa Blood and Meal Mixture	8.00	2.47	5.00
Navassa High Grade Guano	8.00	2.47	3.00
Navassa Cotton Seed Meal Special 3 Per Cent Guano	8.00	2.47	2.00
Navassa Strawberry Top Dressing	8.00	2.06	4.00
Navassa Guano for Tobacco	8.00	2.06	2.00
Navassa Fruit Growers' Fertilizer	8.00	1.65	6.00
Navassa Dissolved Bone with Potash	8.00	....	4.00
Navassa Grain Fertilizer	8.00	1.65	2.00
Navassa Cotton Seed Meal Guano	8.00	1.65	2.00
Navassa Cotton Fertilizer	8.00	1.65	2.00
Navassa Root Crop Fertilizer	7.00	4.12	7.00
Navassa Creole Guano	6.00	4.12	7.00
Maxim Guano	10.00	2.47	2.00
Corona Guano	10.00	1.65	2.00
Osceola Guano	9.00	1.65	3.00
Harvest Queen Fertilizer	9.00	1.65	2.00
Coree Tobacco Guano	8.00	3.29	4.00
Orton Guano	8.00	2.47	4.00
Clarendon Tobacco Guano	8.00	2.47	3.00
Mogul Guano	8.00	2.06	3.00
Ammoniated Soluble Navassa Guano	8.00	2.06	2.00
Harvest King Guano	8.00	1.65	3.00
Clark's Special Cotton-seed Meal Guano	8.00	1.65	3.00
Occoneechee Tobacco Guano	8.00	1.65	2.00
Sulphate of Ammonia	....	20.59	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.82	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
The Nitrate Agencies Co., Savannah, Ga.—			
Nitrate of Soda, 95 Per Cent	....	15.65	....
The Nitrate Agencies Co., Norfolk, Va.—			
Nitrate of Soda	....	14.85	....
Ocean Fisheries Co., Wilmington, N. C.—			
Fish Scrap	3.40	5.30	....
G. Ober & Sons Co., Baltimore, Md.—			
Pure Raw Bone Meal.....Total	21.00	3.71	....
Ober's High Grade Acid Phosphate	16.00	....	....
Ober's Dissolved Bone Phosphate	14.00	....	....
Ober's Standard Potash Compound	12.00	....	5.00
Ober's Dissolved Animal Bone	10.00	2.47	....
Ober's Dissolved Bone, Phosphate and Potash,	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Ober's Special High Grade Fertilizer	9.00	2.47	3.00
Ober's Special Ammoniated Dissolved Bone	9.00	1.65	2.00
Ober's Farmers' Mixture	9.00	.82	2.00
Ober's H. G. Fertilizer	8.00	3.30	4.00
Ober's Special Compound for Tobacco	8.00	2.47	3.00
Ober's Standard Tobacco Fertilizer	8.00	1.65	2.00
Ober's Special Cotton Compound	8.00	1.65	2.00
Ober's Soluble Ammoniated Superphosphate of Lime	8.00	1.65	2.00
Ober's Stag Guano	8.00	.82	4.00
Ober's Acid Phosphate with Potash	8.00	....	4.00
Ober's Complete Fertilizer	6.00	4.12	6.00
Ober's Special Potash Compound for Tobacco,	6.00	2.47	7.00
Ober's Special Tobacco Bed Fertilizer 10 Per Cent	4.00	8.25	3.00
Acid Phosphate with Potash	10.00	....	4.00
Cooper's Pungo Guano	8.00	2.06	2.00
Nitrate of Soda	....	15.50	....
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
The Pocomoke Guano Co., Norfolk, Va.—			
Pure Ground Bone.....Total	20.00	3.70	....
Superb Acid Phosphate	16.00	....	....
Peerless Acid Phosphate	14.00	....	....
Alkali Bone	11.00	....	2.00
Pocomoke Bone and Potash Mixture	10.00	....	4.00
Pocomoke Superphosphate	8.50	1.65	2.00
Pocomoke Wheat, Corn and Peanut Manure	8.00	1.00	4.00
Pocomoke Defiance Bone and Potash	8.00	....	4.00
10-2 Potash Mixture	10.00	....	2.00
Monticello Animal Bone Fertilizer	9.00	1.85	4.00
Cinco Tobacco Guano	8.50	2.06	2.50
Electric Crop Grower	8.50	1.65	2.00
Garrett's Grape Grower	8.00	3.29	10.00
Harvey's High Grade Monarch	8.00	2.47	3.00
Monarch Tobacco Grower	8.00	2.47	3.00
C. C. C. (Crescent Complete Compound)	8.00	1.65	3.00
Pamlico Superphosphate	8.00	1.65	2.00
Standard Truck Guano	7.00	4.11	5.00
Faultless Ammoniated Superphosphate	7.00	3.29	4.00
Freeman's 7 Per Cent Irish Potato Grower	6.00	5.76	5.00
Seaboard Popular Trucker	6.00	5.76	5.00
Coast Line Truck Guano	5.00	8.23	3.00
Smith's Special Formula	4.00	3.29	6.00
Nitrate of Soda	....	15.00	....
Ground Fish	....	8.23	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Pamlico Chemical Co., Washington, N. C.—			
Pamlico 16 Per Cent Acid Phosphate	16.00	....	....
Pamlico Bone Phosphate	14.00	....	....
Pamlico 8-4-4 Guano	8.00	3.30	4.00
Pamlico High Grade Tobacco Grower	8.00	2.47	5.00
Pamlico Success Guano	8.00	2.47	3.00
Pamlico Bone and Fish Guano	8.00	1.65	2.00
Pamlico Cotton Guano	8.00	1.65	2.00
Pamlico 7-7-7 Guano	7.00	5.77	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Pamlico Special Irish Potato Guano	7.00	4.12	7.00
Pamlico Special Sweet Potato Guano	7.00	4.12	5.00
Pamlico 6-3-6	6.00	2.47	6.00
Pamlico Cereal Side Dresser	2.50	7.42	2.50
Pamlico Ground Fish	....	8.25	....
Dissolved Bone and Potash Compound	10.00	....	2.00
Blount's Special Cotton Grower	9.00	2.27	2.00
Blount's Special Tobacco Grower	8.00	2.47	3.00
Blount's H. G. Potato Grower	7.00	4.12	5.00
Prosperity Cotton Grower	9.00	2.26	2.00
Cowell's Great Potato Grower	8.00	4.12	7.00
Bull's Eye Tobacco Grower	8.00	3.30	4.00
Tobacco Growers' Friend	8.00	2.47	3.00
Staton, Taylor & Mayo's Special Cotton Grower	8.00	2.26	2.00
Farmers' Best Guano	8.00	2.06	3.00
Falkland H. G. Tobacco Guano	6.00	2.47	6.00
Cowell's Great Cabbage Grower	5.00	8.25	2.50
German Kainit	....	....	12.00
Planters Fertilizer and Phosphate Co., Charleston, S. C.—			
Planters' High Grade Acid Phosphate	14.00	....	....
Planters' H. G. Tobacco Fertilizer	8.00	2.47	3.00
Planters' H. G. Top Dresser	4.00	6.18	2.50
Planters' Soluble Bone	13.00	....	....
Planters' Soluble Guano	8.00	2.47	3.00
Planters' Bone and Potash	12.00	....	1.00
Planters' Bone and Potash	10.00	....	2.00
Planters' Bone and Potash	8.00	....	4.00
Planters' Special Meal Mixture	10.00	1.65	2.00
Planters' Special Mixture	9.00	.82	3.00
Planters' Special Mixture	8.00	4.12	5.00
Planters' Special Cotton Fertilizer	8.00	3.29	4.00
Planters' Grain Grower	10.00	.82	3.00
Planters' Acid and Potash	10.00	....	4.00
Planters' Blood, Bone and Fish Guano	9.00	1.65	3.00
Planters' Bright Tobacco Fertilizer	8.00	3.29	4.00
Planters' Cotton and Corn Fertilizer	8.00	2.47	4.00
Planters' Fertilizer	8.00	2.06	2.00
Planters' Standard Fertilizer	8.00	1.65	2.00
Planters' Muriate of Potash	....	....	48.00
Planters' German Kainit	....	....	12.00
Excelsior H. G. Acid Phosphate	14.00	....	....
Special Mixture	8.00	3.29	6.00
Nitrate of Soda	....	14.83	....
Sulphate of Potash	....	....	48.00
Peruvian Guano Corporation, Charleston, S. C.—			
Peruvian Guano, Ex. S.S. Celia.....Total	18.00	2.88	3.25
Peruvian Guano, Ex. S.S. Chipana.....Total	12.00	4.58	2.50
Peruvian Guano S.S. Chipana.....Total	12.00	2.88	2.00
Peruvian Guano Ex. S.S. Chipana.....Total	12.00	2.88	2.00
Peruvian Guano, Ex. S.S. Chipana.....Total	11.50	5.96	2.75
Peruvian Guano, Ex. S.S. Chipana.....Total	11.00	5.76	2.50
Peruvian Top Dresser.....Total	8.00	7.00	3.50
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
13 Per Cent Acid Phosphate	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
12 Per Cent Acid Phosphate	12.00	....	....
S. S. Chipana.....Total	14.00	3.29	2.00
S. S. Condon.....Total	14.00	2.46	2.00
S. S. Capac.....Total	13.00	4.93	2.25
Sulphate of Ammonia	....	20.56	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.80	....
Dried Blood	....	13.16	....
Fish Scrap	....	8.22	....
Muriate of Potash	....	....	49.00
Kainit	....	....	12.00
Pearsall & Co., Wilmington, N. C.—			
H. G. Acid Phosphate	16.00	....	....
H. G. Acid Phosphate	14.00	....	....
High Grade Tobacco	8.00	2.47	3.00
Pearsall's Bone and Potash	10.00	....	4.00
Pearsall's Berry Guano	8.00	2.47	10.00
Pearsall's Potato and Truck Guano	6.00	4.12	7.00
Pearsall's Top Dresser	....	7.42	3.00
Fish and Potash Compound	8.00	3.29	4.00
Bone Meal and Fish.....Total	8.00	3.29	4.00
F. F. F. G.	8.00	2.47	3.00
Corn Guano	8.00	1.65	3.00
Eagle	8.00	1.65	2.00
Fernside	6.00	4.12	7.00
Nitrate of Soda	....	14.25	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Pacific Guano Co., Charleston, S. C.—			
Standard Pacific Acid Phosphate	12.00	....	....
Standard Soluble Pacific Guano	8.50	1.65	2.00
High Grade Pacific Fertilizer	8.00	2.46	3.00
Powhatan Chemical Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	20.00	3.29	....
Magic Dissolved Bone Phosphate	16.00	....	....
Magic Corn Grower	10.00	.82	1.00
Magic Crop Grower	10.00	.82	1.00
Magic Bone and Potash Mixture	10.00	....	4.00
Magic Mixture	9.00	1.65	1.00
Magic Wheat Grower	9.00	.82	2.00
Magic Fertilizer	8.00	2.47	4.00
Magic Cotton Grower	8.00	1.65	2.00
Magic Special Fertilizer	8.00	1.65	2.00
Magic Tobacco Grower	8.00	1.65	2.00
Magic Peanut Special	8.00	.82	4.00
Magic Peanut Grower	8.00	....	4.00
Magic Grain and Grass Grower	8.00	....	4.00
High Grade Acid Phosphate	14.00	....	....
High Grade Bone and Potash Mixture	12.00	....	5.00
Powhatan Acid Phosphate	13.00	....	....
Virginia Dissolved Bone	12.00	....	....
Bone and Potash Mixture	10.00	....	2.00
Guilford Special Tobacco Fertilizer	9.00	2.47	6.00
Economic Cotton Grower	9.00	2.26	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Johnson's Best Fertilizer	9.00	2.06	5.00
Holt's Magic Fertilizer	9.00	2.06	5.00
King Trucker	8.00	4.11	5.00
North State Special	8.00	3.29	4.00
P. C. Co.'s Hustler	8.00	2.47	3.00
King Brand Fertilizer	8.00	2.06	3.00
White Leaf Tobacco Fertilizer	8.00	2.06	3.00
Powhatan Bone and Potash Mixture	8.00	....	4.00
Powhatan Trucker	7.00	4.94	5.00
Sulphate of Ammonia	....	19.75	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Pure German Kainit	....	....	12.00
Pine Level Oil Mill Co., Pine Level, N. C.—			
Pine Level 14 Per Cent Acid Phosphate	14.00	....	....
Pine Level High Grade	8.00	2.47	3.00
Sutton's Potato Guano	9.00	2.88	5.00
Oliver's Truck Grower Guano	8.00	3.30	4.00
Hale's Special for Tobacco	8.00	2.47	4.00
Cotton Grower for All Crops	8.00	1.65	2.00
H. G. Top Dresser	3.00	6.03	6.00
Nitrate of Soda	....	15.22	....
Muriate Potash	....	....	48.00
Patapsco Guano Co., Baltimore, Md.—			
Patapsco Pure Ground Bone.....Total	20.59	3.70	....
Patapsco Pure Dissolved S. C. Phosphate	14.00	....	....
Patapsco High Grade Phosphate and Potash	11.00	....	5.00
Patapsco 10 and 4 Potash Mixture	10.00	....	4.00
Patapsco Soluble Bone and Potash	10.00	....	2.00
Patapsco Guano for Tobacco	9.25	2.06	2.00
Patapsco Guano	9.25	2.06	2.00
Patapsco Tobacco Fertilizer	9.00	2.47	3.00
Patapsco Cotton and Tobacco Special	8.00	3.29	4.00
Patapsco Plant Food for Tobacco, Potatoes and Truck	8.00	2.47	5.00
Patapsco Special Tobacco Mixture	8.00	2.06	3.00
Patapsco 7-7-7 Truck Guano	7.00	5.76	7.00
Patapsco Trucker for Early Vegetables	7.00	4.11	5.00
Patapsco Potato Guano	6.00	4.11	7.00
Patapsco Crop Dresser	4.00	3.30	4.00
Patapsco Crop Dresser	4.00	3.29	4.00
Sulphate of Ammonia	....	19.75	....
Florida Soluble Phosphate	16.00	....	....
Baltimore Soluble Phosphate	11.00	....	2.00
Coon Brand Guano	9.00	.82	3.00
Choctaw Guano	8.00	2.47	3.00
Unicorn Guano	8.00	2.06	3.00
Swanson's Gold Leaf Special	8.00	2.06	2.00
Planters' Favorite	8.00	1.65	2.00
Seagull Ammoniated Guano	8.00	1.65	2.00
Grange Mixture	8.00	1.65	2.00
Money Maker Guano	7.00	3.70	6.00
Nitrate of Soda	....	15.00	....
Ground Fish	....	8.23	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Pocahontas Guano Co., Lynchburg, Va.—			
Fine Ground Bone Meal.....Total	23.00	2.47	....
Pure Raw Bone Meal.....Total	22.00	3.71	....
Carrington's S. C. Phosphate, Waukesha Brand	16.00	....	....
Imperial Dissolved S. C. Phosphate.....	14.00	....	....
Wabash Wheat Mixture.....	10.00	....	4.00
Carrington's Superior Grain Compound.....	10.00	....	2.00
Pocahontas Special Tobacco Fertilizer.....	9.00	2.47	3.00
High Grade 4 Per Cent Tobacco Compound, Mohawk King	9.00	1.85	4.00
Yellow Tobacco Special.....	9.00	1.65	2.00
Standard Tobacco Guano, Old Chief Brand...	9.00	1.65	2.00
Indian Tobacco Grower.....	8.00	2.47	4.00
Farmers' Favorite Apex Brand.....	8.00	2.47	3.00
Special Truck Grower, Eagle Mount Brand..	8.00	2.06	6.00
Spot Cash Tobacco Compound.....	8.00	2.06	3.00
Carrington's Banner Brand Guano.....	8.00	1.65	2.00
A. A. Complete Champion Brand.....	8.00	1.03	3.00
Cherokee Grain Special.....	8.00	....	4.00
Planters Cotton Seed Oil Co., Rocky Mount, N. C.—			
Royal Cotton Grower.....	9.00	2.20	2.00
Tar River Special.....	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Tobacco Guano.....	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Cotton Guano.....	8.00	1.65	2.00
Planters' C. S. Oil Co.'s Cotton Guano.....	8.00	1.65	2.00
Eagle Guano	8.00	1.65	2.00
Braswell's Special for Tobacco.....	7.00	2.26	3.50
E. L. D. Special.....	6.50	2.47	3.00
Piedmont-Mt. Airy Guano Co., Baltimore, Md.—			
Piedmont Bone Meal.....Total	21.00	3.29	....
Piedmont Bone and Peruvian Mixture.....	8.00	1.65	2.00
Piedmont High Grade S. C. Bone Phosphate..	14.00	....	....
Piedmont High Grade Ammoniated Bone and Potash	8.00	2.47	3.00
Piedmont High Grade Guano for Cotton.....	8.00	2.47	3.00
Piedmont Special Potash Mixture.....	10.00	....	5.00
Piedmont Special Farmers' Tobacco Guano..	8.40	2.47	4.00
Piedmont Special for Cotton, Corn and Peanuts	8.00	1.65	2.00
Piedmont Special Truck.....	6.00	5.76	5.00
Piedmont Special Potato Guano.....	6.00	4.94	7.00
Piedmont Farmers' Bone and Potash.....	10.00	....	2.00
Piedmont Farmers' Standard.....	9.00	1.65	2.00
Piedmont Farmers' Cotton Grower.....	9.00	.82	3.00
Piedmont Farmers' Favorite.....	8.00	.82	4.00
Piedmont Essential Tobacco Compound.....	9.00	1.65	2.00
Piedmont Raw and Dissolved Bone Compound,	9.00	1.00	2.00
Piedmont Unexcelled Guano.....	8.00	3.29	4.00
Levering's Reliable Tobacco Guano.....	8.00	2.47	3.00
Piedmont Guano for Tobacco.....	8.00	2.06	3.00
Piedmont Guano for All Crops.....	8.00	2.06	3.00
Piedmont Red Leaf Tobacco Guano.....	8.00	1.65	2.00
Piedmont Cultivator Brand.....	8.00	1.65	2.00
Piedmont Guano for Wheat.....	8.00	1.65	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Piedmont Star Bone and Potash	8.00	....	5.00
Piedmont's 7-7-7 Truck Guano	7.00	5.76	7.00
Piedmont Early Vegetable Manure	6.00	4.12	7.00
Piedmont Early Trucker	6.00	4.12	5.00
Piedmont Vegetable Compound	6.00	3.29	8.00
Piedmont Potato Producer	5.00	2.47	6.00
Levering's Potashed Bone	10.00	....	4.00
Levering's Ammoniated Bone	9.00	.82	3.00
Levering's Standard	8.00	1.65	3.00
Stowe Brothers' Select	8.00	3.29	4.00
Salsbury's H. G. Ammoniated Guano	8.00	2.47	3.00
Salsbury's Special for Cotton, Corn and Peanuts	8.00	1.65	2.00
Hunter & Dunn's Special Guano	8.00	2.47	3.00
Hunter & Dunn's Ammoniated Fertilizer	8.00	1.65	2.00
Bailey's Buck Brand	8.00	1.65	2.00
Haynes' Cultivator Brand Guano	8.00	1.65	2.00
Sulphate of Ammonia	....	20.58	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.23	....
Boykin's Top Dresser	....	7.41	3.00
Muriate of Potash	....	....	48.00
The Quinnepiac Co., Charleston, S. C.—			
Standard Quinnepiac Acid Phosphate	13.00	....	....
Standard Quinnepiac Pine Island Ammoniated Superphosphate	9.00	1.85	1.00
The Robertson Fertilizer Co., Norfolk, Va.—			
Robertson's Raw Bone Meal.....Total	20.00	3.71	....
Robertson's Soluble H. G. Guano	8.00	2.47	4.00
Robertson's X-(T) Tobacco Grower	8.00	2.06	2.00
Robertson's 5-6-7	6.00	4.13	7.00
Robertson's 7 Per Cent for Truck	5.00	5.78	5.00
Robertson's 10 Per Cent Truck Guano	2.00	8.25	2.00
High Peak Acid Phosphate	16.00	....	....
Scepter Brand Acid Phosphate	14.00	....	....
J. W. S. Special Bone and Potash Mixture	12.00	....	5.00
J. W. S. Alkaline Bone	10.00	....	5.00
Skyscraper Bone and Potash Compound	10.00	....	4.00
Level Run Dissolved Bone and Potash	10.00	....	2.00
Dodson's Choice H. G. Complete Manure	9.00	2.47	3.00
Beaver Brand Soluble Guano	9.00	1.85	4.00
Beaver Brand Soluble Tobacco Guano	9.00	1.85	4.00
Beaver Brand Bright Tobacco Special	9.00	1.85	4.00
P. M. C. High Grade Soluble Guano	8.00	4.12	7.00
Wood's Winner H. G. Guano	8.00	3.30	4.00
Big Cropper High Grade Guano	8.00	2.47	3.00
Double Dollar Soluble Guano	8.00	1.65	2.00
Double Dollar Soluble Cotton Grower	8.00	1.65	2.00
Double Dollar Soluble Tobacco Guano	8.00	1.65	2.00
Ten Strike Soluble Crop Producer	8.00	1.00	4.00
M. C. Special Bone and Potash Mixture	8.00	....	4.00
Nitrate of Soda	....	14.85	....
Dried Blood	....	13.20	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
F. S. Royster Guano Co., Norfolk, Va.—			
Pure Raw Bone Meal.....Total	21.50	3.71	....
Royster's H. G. 17 Per Cent Acid Phosphate..	17.00	....	....
Royster's H. G. 16 Per Cent Acid Phosphate..	16.00	....	....
Royster's 14 Per Cent Acid Phosphate.....	14.00	....	....
Royster's Dissolved Bone.....	13.00	....	....
Royster's XX Acid Phosphate.....	12.00	....	....
Royster's Bone and Potash Mixture.....	11.00	....	5.00
Royster's Bone and Potash for Grain.....	10.00	....	3.00
Royster's Bone and Potash Mixture.....	10.00	....	2.00
Royster's Soluble Guano.....	10.00	1.65	2.00
Royster's 10-5 Bone and Potash Mixture.....	10.00	....	5.00
Royster's 10 and 4 Bone and Potash Mixture.	10.00	....	4.00
Royster's 4-9-5 Special.....	9.00	3.30	5.00
Royster's Meal Mixture.....	9.00	2.26	2.00
Royster's Cotton Grower.....	9.00	2.26	2.00
Royster's Special 1-9-2 Guano.....	9.00	.82	2.00
Royster's Special 4-8-3.....	8.00	3.30	3.00
Royster's Special Sweet Potato Guano.....	8.00	2.47	3.00
Royster's Special Wheat Fertilizer.....	8.00	1.65	2.00
Royster's Special 7 Per Cent Truck Guano....	7.00	5.77	7.00
Royster's Special 10 Per Cent Truck Guano...	5.00	8.24	3.00
Royster's Best Guano.....	8.00	3.71	7.00
Royster's Complete Guano.....	8.00	1.65	2.00
Royster's 8 and 4 Bone and Potash Mixture..	8.00	....	4.00
Royster's Early Truck Guano.....	7.00	4.12	8.00
Royster's Peanut Special.....	7.00	....	5.00
Royster's Irish Potato Guano.....	6.00	4.12	7.00
Royster's Irish Potato Guano.....	6.00	4.12	7.00
Royster's 2-6-5 Special.....	6.00	1.65	5.00
Royster's Cabbage Guano.....	5.00	8.23	2.50
Royster's Potato Guano.....	5.00	4.94	7.00
Royster's 4-6-4 Special.....	4.00	4.94	4.00
Tomlinson's Special	9.00	2.47	5.00
Watkins' Special	9.00	2.06	5.00
Haynes' Special	9.00	2.06	3.00
Viking Ammoniated Guano.....	9.00	1.65	3.00
Special Compound	9.00	1.65	1.00
Cobb's High Grade for Tobacco.....	8.00	3.30	5.00
Trucker's Delight	8.00	3.30	4.00
Milo Tobacco Guano.....	8.00	3.30	4.00
Jupiter High Grade Guano.....	8.00	3.30	4.00
Black Wrapper Special Tobacco Guano.....	8.00	3.30	2.00
Eagle's Special Tobacco Guano.....	8.00	2.47	5.00
Bonanza Tobacco Guano.....	8.00	2.47	3.00
Marlborough High Grade Cotton Guano.....	8.00	2.47	3.00
Williams' Special Guano.....	8.00	2.06	5.00
Orinoco Tobacco Guano.....	8.00	2.06	3.00
Special Tobacco Compound.....	8.00	2.06	2.00
Corbett & Moore's Special.....	8.00	1.65	3.50
Farmers' Bone Fertilizer.....	8.00	1.65	2.00
Webb's Korn King.....	8.00	1.65	2.00
Farmers' Bone Fertilizer for Tobacco.....	8.00	1.65	2.00
Jumbo Peanut Grower.....	8.00	1.02	4.00
Royal Special Potato Guano.....	7.00	4.12	7.00
Royal Potato Guano.....	7.00	4.12	5.00
Ballentine's Potato Guano.....	6.00	5.77	7.00
Arrow Potato Guano.....	6.00	5.77	5.00
Oakley's Special Tobacco Guano.....	6.00	3.30	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Oakley's Special Tobacco Guano	6.00	3.30	4.00
McDowell's Cotton Grower	6.00	3.30	2.00
Humphrey's Special for Tobacco	6.00	2.55	3.20
Wiggins' Special	5.50	3.30	3.00
Harvey's Cabbage Guano	5.00	6.59	3.00
Phillips' Special	5.00	1.65	6.00
Dry Fish .....Total	3.50	8.64	....
Nitrate of Soda	....	15.22	....
Magic Top Dresser	....	7.42	3.00
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Royce Brothers & Sons Co., Inc., Hampton, Va.—			
Crab Scrap .....Total	3.25	5.33	....
J. H. Roberson & Co., Robersonville, N. C.—			
Roberson's Cotton Grower	9.00	2.26	2.00
Roberson's Special for Bright Tobacco	8.00	2.06	3.00
Roberson's Special Potato Grower	7.00	5.77	7.00
Roberson's Potato Guano	6.00	5.77	5.00
Richmond Guano Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	20.00	3.29	....
Rex Dissolved Bone Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
High Grade Wheat and Grass Fertilizer	14.00	....	....
Premium Bone and Potash Mixture	13.00	....	3.00
Premium Dissolved Bone	13.00	....	....
Premium Corn Grower	10.00	.82	1.00
Premium Cotton Grower	9.00	.82	3.00
Premium Wheat Grower	9.00	.82	2.00
Premium Tobacco Fertilizer	8.00	1.65	2.00
Premium Brand Fertilizer	8.00	1.65	2.00
Premium Peanut Special	8.00	.82	4.00
Premium Peanut Grower	8.00	....	4.00
Hunter & Dunn's Dissolved Bone	13.00	....	....
Hunter & Dunn's Special Ammoniated Fertilizer	9.00	2.47	2.25
Hunter & Dunn's Ammoniated Fertilizer	8.00	1.65	2.00
H. G. Bone and Potash Mixture	12.00	....	5.00
Old Homestead Dissolved Bone	12.00	....	....
Dissolved S. C. Phosphate	12.00	....	....
Bone Mixture	10.00	.82	1.00
Rex Bone and Potash Mixture	10.00	....	4.00
Bone and Potash Mixture	10.00	....	2.00
Bone Mixture	9.00	1.65	1.00
Sanders' Special Formula for Bright Tobacco,	9.00	2.88	5.00
Carolina Cotton Grower	9.00	2.26	2.00
Burton's Special Tobacco Fertilizer	9.00	2.06	3.00
Lowery's Special Fertilizer	9.00	1.65	3.00
Cracker Jack Fertilizer	9.00	1.65	2.00
Southern Trucker	8.00	4.11	5.00
Perfection Special	8.00	3.29	4.00
Carolina Bright Tobacco Fertilizer	8.00	2.47	3.00
Gilt Edge Fertilizer	8.00	2.47	3.00
Carolina Bright Special Tobacco Fertilizer	8.00	2.26	2.50
Tip Top Fertilizer	8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Carolina Bright for Cotton	8.00	2.06	1.50
Special Premium Brand for Tobacco	8.00	1.85	2.25
Special Premium Brand for Plants	8.00	1.85	2.25
Special High Grade for Truck	7.00	4.94	5.00
Beeson's Special Fertilizer	8.00	1.65	6.00
Rex Tobacco Fertilizer	8.00	1.65	4.00
Parker & Hunt's Special Tobacco Fertilizer	8.00	1.65	2.00
Parker & Hunt's Special Fertilizer	8.00	1.65	2.00
Parker & Hunt's Corn Fertilizer	8.00	.82	3.00
Edgecombe Cotton Grower	8.00	1.65	2.00
Tip Top Bone and Potash Mixture	8.00	....	4.00
Winter Grain and Grass Grower	8.00	....	4.00
Clark's Special Formula	7.00	4.94	6.00
10 Per Cent Cabbage Guano	6.00	8.23	2.00
Carter's Special for Tobacco	4.00	2.47	6.00
Smith's Special Fertilizer	4.00	1.65	7.00
Sulphate of Ammonia	....	19.75	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Pure German Kainit	....	....	12.00
Red Cross Guano Co., Lynchburg, Va.—			
Red Cross Bone Meal.....Total	22.00	3.00	....
Red Cross Bone and Potash	10.00	....	2.00
Red Cross Standard Phosphate	14.00	....	....
Red Cross H. G. Phosphate	16.00	....	....
Red Cross Grain Grower	10.00	....	4.00
Red Cross for Tobacco and Truck	9.00	1.85	4.00
Red Cross for Bright Tobacco	9.00	1.65	2.00
Red Cross Special for Tobacco	8.00	2.47	3.00
Red Cross Tobacco Guano	8.00	2.06	3.00
Red Cross Crop Grower	8.00	1.65	2.00
Raisin-Monumental Co., Baltimore, Md.—			
Raisin 16 Per Cent Acid Phosphate	16.00	....	....
Raisin 14 Per Cent Acid Phosphate	14.00	....	....
Raisin 13 Per Cent Acid Phosphate	13.00	....	....
Raisin Special Bone and Potash	10.00	....	5.00
Raisin Bone and Potash	10.00	....	2.00
Raisin Dixie Guano	9.00	1.65	2.00
Raisin Gold Standard	8.00	2.47	3.00
Raisin's Indian Brand for Tobacco	8.00	2.47	3.00
Raisin Empire Guano	8.00	1.65	2.00
Baltimore Special Mixture	9.00	.82	2.00
Read Phosphate Co., Charleston, S. C.—			
Read's H. G. Dissolved Bone	16.00	....	....
Read's H. G. Acid Phosphate	14.00	....	....
Read's H. G. Guano	8.00	3.30	4.00
Read's H. G. Tobacco Leaf	8.00	2.47	3.00
Read's H. G. Cotton Grower	8.00	2.47	3.00
Read's Bone and Potash	10.00	....	4.00
Read's Alkaline Bone	10.00	....	2.00
Read's Manipulated Guano	9.00	1.65	3.00
Read's Ammoniated Dissolved Bone	8.00	3.30	6.00
Read's Soluble Fish Guano	8.00	1.65	2.00
Read's Blood and Bone Fertilizer	8.00	1.62	2.00
Read's Special Potash Mixture	8.00	....	4.00
German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Reidsville Fertilizer Co., Reidsville, N. C.—			
Reidsville Acid Phosphate	16.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
Bone and Potash	8.00	....	4.00
Lion Brand Fertilizer	9.00	2.47	6.00
Reidsville Hustler	9.00	.82	2.00
Royal Fertilizer	8.00	2.47	3.00
Climax Fertilizer	8.00	2.06	3.00
Broad Leaf Tobacco Guano	8.00	1.85	2.50
Banner Fertilizer	8.00	1.65	2.00
Champion Guano	8.00	1.65	2.00
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Swift Fertilizer Works, Atlanta, Ga., and Wilmington, N. C.—			
Swift's Pure Bone Meal.....Total	25.00	2.47	....
Swift's Pure Raw Bone Meal.....Total	23.00	3.71	....
Swift's Pure Nitrate of Soda	....	14.82	....
Swift's Special High Grade Acid Phosphate	16.00	....	....
Swift's Special High Grade Phosphate and Potash	12.00	....	6.00
Swift's Special High Grade Guano	9.50	4.12	3.00
Swift's Special Blood Guano for Cotton or Tobacco, H. G.	8.00	2.06	3.00
Swift's Special Peanut Grower Standard Grade Guano	8.00	.82	4.00
Swift's Special Trucker H. G.	6.00	5.76	5.00
Swift's Special Potato Grower H. G. Guano	6.00	4.12	7.00
Swift's Special 10 Per Cent Blood and Bone			
Swift's Cultivator High Grade Acid Phosphate	14.00	....	....
Swift's Harrow Standard Grade Acid Phosphate	13.00	....	....
Swift's Atlanta High Grade Phosphate and Potash	12.00	....	4.00
Swift's Chattahoochee Standard Grade Acid Phosphate	12.00	....	....
Swift's Farmers' Home High Grade Phosphate and Potash	10.00	....	4.00
Swift's Corn and Cotton Grower H. G. Guano	10.00	2.47	3.00
Swift's Eagle High Grade Guano	10.00	1.65	2.00
Swift's Plow Boy Guano	10.00	.82	1.00
Swift's Field and Farm Standard Grade Phosphate and Potash	10.00	....	2.00
Swift's Wheat Grower Standard Grade Phosphate and Potash	10.00	....	2.00
Swift's Blood, Bone and Potash High Grade Guano	9.50	3.29	7.00
Swift's Cotton King High Grade Guano	9.00	2.47	2.00
Swift's Cotton Plant Standard Grade Guano	9.00	1.65	1.00
Swift's Farmers' Favorite High Grade Guano,	9.00	1.65	3.00
Swift's Cape Fear Truck Guano, H. G.	8.00	4.12	2.00
Swift's Monarch H. G. Guano Vegetable Grower	8.00	3.29	4.00
Swift's Strawberry Grower H. G. Guano	8.00	2.47	10.00
Swift's Carolina Tobacco Grower H. G. Guano,	8.00	2.47	3.00
Swift's Ruralist High Grade Guano	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Pioneer High Grade Guano Tobacco Grower	8.00	1.65	4.00
Swift's Red Steer Standard Grade Guano	8.00	1.65	2.00
Swift's Golden Harvest Standard Grade Guano,	8.00	1.65	2.00
Swift's Plantation Standard Grade Phosphate and Potash	8.00	....	4.00
Swift's Carolina 7 Per Cent Special Trucker H. G. Guano	7.00	5.76	7.00
Swift's Early Trucker H. G. Guano	7.00	4.12	5.00
Swift's Special Irish Potato Grower H. G. Guano	7.00	4.12	8.00
High Grade Swift's No. 1 Ground Tankage	6.00	8.24	....
Swift's Favorite Truck Guano H. G.	6.00	4.94	6.00
Trucker H. G. Guano	5.00	8.23	3.00
Swift's Ground Dried Blood	....	13.18	....
Swift's Muriate of Potash	....	....	50.00
Swift's German Kainit	....	....	12.00
Southern Chemical Co., Inc., Roanoke, Va.—			
Southern Queen	8.00	2.47	10.00
Success	8.00	2.47	3.00
Valley Queen	8.00	1.65	10.00
Farmers' Joy	8.00	1.65	4.00
Our Favorite	8.00	1.65	2.00
Spartanburg Fertilizer Co., Spartanburg, S. C.—			
Tiger Brand Acidulated Phosphate	14.00	....	....
West's Potash Acid	13.00	....	3.00
Gosnell's Plant Food	10.50	2.46	2.00
Corn Formula	10.50	1.65	5.00
N. C. Special	10.50	1.65	8.00
Dana's Best	10.00	....	4.00
Melrose	10.00	....	2.00
Boll Buster	9.00	1.65	2.00
Cotton Compound	8.75	1.65	2.00
Glencoe	8.00	2.46	3.00
Glencoe	8.00	2.46	3.00
Potato Guano	7.00	2.46	7.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	50.00
Scotland Neck Guano Co., Scotland Neck, N. C.—			
Our 16 Per Cent Acid Phosphate	16.00	....	....
Our 14 Per Cent Acid Phosphate	14.00	....	....
Our Bone and Potash Mixture	10.00	....	4.00
Our Favorite Cotton Seed Meal Guano	9.00	1.65	2.00
Our Bright Tobacco Guano	8.00	2.47	3.00
Our Cotton Grower	8.00	1.65	2.00
Our Best Peanut Guano	5.50	1.23	5.50
Noah Biggs Truck Guano	9.00	4.10	5.00
Biggs Cotton Seed Meal Fish Scrap Guano	9.00	3.30	4.00
Josey's Cotton Seed Meal and Fish Scrap Tobacco Guano	9.00	2.47	3.00
Old Halifax Cotton Seed Meal and Fish Scrap Tobacco Guano	9.00	2.47	3.00
Scotland Neck's Favorite Cotton Seed Meal and Fish Scrap Guano	9.00	2.05	2.50
Josey's Cotton Seed Meal and Fish Scrap Cotton Grower	9.00	2.05	2.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
K. Elite Top Dressing	3.00	7.40	3.50
Nitrate of Soda	....	15.50	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	48.00
Our Genuine German Kainit	....	....	12.00
The Southern Exchange Co., Maxton, N. C.—			
S. E. C. Acid Phosphate	16.00	....	....
S. E. C. Acid Phosphate	14.00	....	....
S. E. C. Bone and Potash Mixture	10.00	....	4.00
S. E. C. Bone and Potash Mixture	10.00	....	2.00
Juicy Fruit Fertilizer	9.00	1.85	4.00
The Walnut Fertilizer	8.50	2.06	2.50
Melon Grower	8.00	4.12	7.00
McKimmon's Special Truck Formula	8.00	4.12	7.00
Southern Exchange Co.'s Bright Tobacco Formula	8.00	2.47	4.00
That Big Stick Guano	8.00	2.47	4.00
Bull of the Woods Fertilizer	8.00	2.47	4.00
Jack's Best Fertilizer	8.00	2.47	3.00
Correct Cotton Compound	8.00	2.47	3.00
R. M. C. Special Crop Grower	8.00	2.47	3.00
Southern Exchange Co.'s Special Tobacco Fertilizer	8.00	1.65	3.00
Currie's Crop Lifter	8.00	1.65	3.00
The Racer Guano	8.00	1.65	3.00
The Coon Guano	8.00	1.65	2.00
Two Fours Guano	8.00	3.30	4.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
The Southern Cotton Oil Co., Charlotte District, Concord, Charlotte, Davidson, Shelby, Gibson, Monroe and Wadesboro.—			
Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
Gold Seal	14.00	....	....
Silver King	13.00	....	....
Conqueror Bone and Potash	10.00	....	4.00
Magnolia Bone and Potash	10.00	....	2.00
Uncle Sam	9.00	2.47	3.00
Home Made	9.00	2.05	3.00
Razem	9.00	1.65	3.00
King Bee	8.65	1.65	2.00
Choice	8.00	3.30	6.00
Conqueror	8.00	3.30	4.00
Canto	8.00	3.29	6.00
Melonite	8.00	3.29	4.00
Peacock	8.00	2.47	3.00
Moon	8.00	2.47	3.00
Red Bull	8.00	2.06	2.00
All-to-Good	8.00	2.05	3.00
Gloria	8.00	1.65	2.00
Double Two	8.00	1.65	2.00
Dandy Top Dresser	4.00	9.07	2.50
Nitrate of Soda	....	15.65	....
Nitrate of Soda	....	13.20	....
Labi	....	8.99	17.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Southern Cotton Oil Co., Goldsboro, Fayetteville, Rocky Mount and Wilson.—			
Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
Southern Cotton Oil Co.'s 14 Per Cent Acid Phosphate	14.00	....	....
Southern Cotton Oil Special Mixture	8.00	3.30	4.00
Southern Cotton Oil Co.'s Special Cotton Grower	8.00	2.47	3.00
Best & Thompson's Special Cotton Grower	9.00	2.27	2.00
Best & Thompson's High Grade	8.00	2.47	3.00
Goldsboro Cotton Grower	9.00	2.26	2.00
Goldsboro Oil Mill Special Mixture	8.00	3.30	4.00
Wilson Oil Mill Special Cotton Grower	8.00	2.47	3.00
Goldsboro Oil Mill Special Cotton Grower	8.00	2.47	3.00
Goldsboro Oil Mill High Grade	8.00	2.26	2.50
Goldsboro Oil Mill Standard	8.00	1.65	2.00
Fayetteville Oil Mill Special Mixture	8.00	3.30	4.00
Fayetteville Oil Mill Special Cotton Grower	8.00	2.47	3.00
Fayetteville Oil Mill High Grade	8.00	2.26	2.50
Fayetteville Oil Mill Standard	8.00	1.65	2.00
Wilson Oil Mill Special Mixture	8.00	3.30	4.00
Wilson Oil Mill High Grade	8.00	2.26	2.50
Wilson Oil Mill Standard	8.00	1.65	2.00
Rocky Mount Oil Mill Special Mixture	8.00	3.30	4.00
Rocky Mount Oil Mill Special Cotton Grower	8.00	2.47	3.00
Rocky Mount Oil Mill High Grade	8.00	2.26	2.50
Rocky Mount Oil Mill Standard	8.00	1.65	2.00
B. G. Thompson's Special Cotton and Tobacco Guano	8.00	2.47	3.00
The Southern Cotton Oil Co.'s Special Tobacco Grower	8.00	2.47	3.00
The Southern Cotton Oil Co. High Grade	8.00	2.26	2.50
The Southern Cotton Oil Co. Standard	8.00	1.65	2.00
Edgerton's Old Reliable	8.00	2.47	3.00
Morning Glory	8.00	2.47	3.00
Echo	8.00	2.06	3.00
Southern Special for Tobacco	6.00	2.90	6.00
Southern Special for Tobacco	6.00	2.89	6.00
Statesville Oil and Fertilizer Co., Statesville, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
H. G. Acid Phosphate	14.00	....	....
Bone and Potash, 10-4	10.00	....	4.00
Bone and Potash, 10-2	10.00	....	2.00
833 Soluble Guano	8.00	2.47	3.00
King Cotton Soluble Guano	8.00	2.47	3.00
Grasoir	8.00	1.65	2.00
822 Statesville Oil and Fertilizer Co	8.00	1.65	2.00
Tidewater Guano Co., Norfolk, Va.—			
Tidewater Raw Bone Meal.....Total	20.00	3.71	....
Top Rail Acid Phosphate	16.00	....	....
Buster Brown Acid Phosphate	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail Phos. Acid.	Nitrogen.	Potash.
Bully Boy Dissolved Bone and Potash	10.00	....	2.00
Diamond Brand Bone and Potash Compound	10.00	....	2.00
High Tide Soluble Guano	8.00	3.30	4.00
Sho Nuf Guano. H. G.	8.00	2.48	3.00
Hawk Eye Soluble Guano	8.00	2.06	2.00
Soil King Special H. G. Guano	8.00	1.86	4.00
Double Action Soluble Guano	8.00	1.65	2.00
Genuine German Kainit	....	....	12.00
Tuscarora Fertilizer Co., Atlanta, Ga., and Wilmington, N. C.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Tuscarora Alkaline Bone	10.00	....	5.00
Tuscarora Acid and Potash	10.00	....	4.00
Tuscarora Bone and Potash	10.00	....	2.00
Tuscarora Bone and Potash	8.00	....	4.00
Tuscarora Trucker	8.00	4.12	7.00
Tuscarora Champion	8.00	2.06	2.50
Tuscarora Fruit and Potato	8.00	1.65	10.00
Tuscarora Fertilizer No. 8-2-5	8.00	1.65	5.00
Tuscarora Standard	8.00	1.65	2.00
Manure Substitute	6.00	3.30	4.00
Fertilizer No. 844	8.00	3.30	4.00
Tobacco Special	8.00	2.47	3.00
Cotton Special	8.00	2.47	3.00
Berry King	8.00	2.06	4.00
King Cotton	8.00	2.06	2.00
Big (4) Four Fertilizer	7.00	1.65	4.00
Nitrate of Soda	....	14.81	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
B. G. Thompson, Goldsboro, N. C.—			
Genuine German Kainit	....	....	12.00
Union Guano Co., Winston-Salem, N. C.—			
Raw Animal Bone Meal.....Total	23.00	2.47	....
Pure Animal Bone Meal.....Total	22.50	3.71	....
Pure Animal Bone Meal.....Total	22.50	2.47	....
Union 16 Per Cent Acid Phosphate	16.00	....	....
Union 12-6 Bone and Potash	12.00	....	6.00
Union 12-5 Bone and Potash	12.00	....	5.00
Union 12-4 Bone and Potash	12.00	....	4.00
Union 12-3 Bone and Potash	12.00	....	3.00
Union 12 Per Cent Acid Phosphate	12.00	....	....
Union 10-6 Bone and Potash	10.00	....	6.00
Union 10-5 Bone and Potash	10.00	....	5.00
Union 10-4 Bone and Potash	10.00	....	4.00
Union 8-5 Bone and Potash	8.00	....	5.00
Union High Grade Acid Phosphate	14.00	....	....
Union Dissolved Animal Bone.....Total	13.00	2.06	....
Union Dissolved Bone	13.00	....	....
Union Prolific Cotton Compound	10.00	3.29	4.00
Union Special Formula for Cotton	10.00	2.47	3.00
Union Mule Brand Guano	10.00	1.65	2.00
Union Bone and Potash	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos Acid.	Nitrogen.	Potash.
Union Perfect Cotton Grower	9.00	2.26	2.00
Union Complete Cotton Mixture	9.00	1.65	3.00
Union Approved Crop Grower	8.75	1.65	2.00
Union Guano for Cotton and Tobacco	8.00	3.29	6.00
Union Premium Guano	8.00	3.29	4.00
Union Homestead Guano	8.00	2.47	3.00
Union Water Fowl Guano	8.00	2.06	3.00
Union Standard Tobacco Grower	8.00	2.06	2.00
Union Potato Mixture	8.00	1.65	10.00
Union Superlative Guano	8.00	.82	4.00
Union Wheat Mixture	8.00	....	4.00
Union Vegetable Compound	7.00	4.12	8.00
Union Truck Guano	7.00	3.29	5.00
Liberty Bell Crop Grower	10.50	....	1.50
Quakers' Grain Mixture	10.00	....	4.00
Giant Phosphate and Potash	10.00	....	3.00
Finch & Harris' Special Bone and Potash Mixture	10.00	....	3.00
Farmers' Blood and Bone Guano	9.00	1.65	3.00
Q and Q (Quality and Quantity) Guano	9.00	1.65	1.00
"B. S." Ammoniated Guano	9.00	.82	3.00
Victoria High Grade Tobacco Guano	8.00	2.47	3.00
Sparger's Special Tobacco Grower	8.00	1.65	3.00
Old Honesty Guano	8.00	1.65	2.00
Old Honesty Tobacco Guano	8.00	1.65	2.00
Fish Brand Ammoniated Guano	8.00	1.65	2.00
Sunrise Ammoniated Guano	8.00	.82	3.00
Nitrate of Soda	....	14.83	....
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
***Union** Abattoir Co., Baltimore, Md., and Richmond, Va.*—			
Pure Bone and Potash Compound	16.00	1.64	2.50
Pure Dissolved Animal Bone	12.00	1.64	....
Potash and Soluble Bone (Red Star)	12.00	....	3.00
Red Star Acid Phosphate	16.00	....	....
Red Star Acid Phosphate	14.00	....	....
Red Star Potash and Soluble Bone	12.00	....	5.00
Red Star Potash and Soluble Bone	10.00	....	5.00
Red Star Potash and Soluble Bone	10.00	....	2.00
Red Star Brand Cotton Guano	8.00	3.29	4.00
Red Star Brand Tobacco Compound	9.00	3.27	2.00
Red Star Early Truck and Tobacco Guano	8.00	3.28	4.00
Red Star Cotton and Tobacco Guano	8.00	2.46	3.00
Red Star Cotton Guano	8.00	1.64	2.00
Red Star Tobacco Fertilizer	8.00	2.05	2.00
Red Star Standard	8.00	1.65	2.00
Red Star Grain and Grass	8.00	1.00	4.00
Red Star Peanut Grower	8.00	1.00	4.00
Red Star Potato Manure	7.00	2.46	10.00
Red Star Special Guano	7.00	2.46	5.00
Red Star 7 Per Cent Guano	6.00	5.74	5.00
Early Potato and Truck Guano	6.00	4.10	7.00
Nitrate of Soda	....	15.58	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
R. L. Upshur, Norfolk, Va.—			
Upshur's 16 Per Cent Acid Phosphate	16.00	....	....
Upshur's High Grade Acid Phosphate	14.00	.....	....
Upshur's Wheat Compound	12.00	....	5.00
Upshur's Bone and Potash Guano	10.00	....	2.00
Upshur's O. P. (Old Plantation)	9.00	1.65	2.00
Upshur's 8-3-3 Cotton	8.00	2.47	3.00
Upshur's High Grade Tobacco Guano	8.00	2.47	3.00
Upshur's Special 2½-8-3	8.00	2.05	3.00
Upshur's F. F. V. (Favorite Fertilizer of Virginia)	8.00	1.65	2.00
Upshur's Peanut Guano	8.00	1.65	2.00
Upshur's G. G. & C. Guano	8.00	1.65	2.00
Upshur's Fish, Bone and Potash	8.00	1.64	4.00
Upshur's Formula, No. 1	7.00	6.58	11.00
Upshur's Formula, No. 2	7.00	6.58	5.00
Upshur's Special Truck Guano	7.00	4.11	8.00
Upshur's F. F. (Farmers' Favorite)	7.00	4.11	6.00
Upshur's F. C. (Farmers' Challenge)	6.00	5.76	6.00
Upshur's 7 Per Cent Irish Potato Guano	6.00	5.76	5.00
Upshur's 4-6-4	6.00	3.69	4.00
Upshur's Top Dresser Guano	5.00	8.23	2.00
Upshur's Norfolk Special 10 Per Cent	5.00	8.23	2.00
Upshur's Special Potato Guano	5.00	5.76	5.00
Upshur's 5 Per Cent	5.00	4.11	5.00
Cotton-seed Meal Mixture	9.00	2.26	2.00
Premo Cotton Guano	8.00	1.65	2.00
Nitrate of Soda	....	15.22	....
Ground Fish	....	8.23	....
Ground Tankage	....	6.58	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Venable Fertilizer Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone.....Total	20.00	3.29	....
Venable's Best Acid Phosphate	16.00	....	....
Venable's Alliance Acid Phosphate	14.00	....	....
Venable's Dissolved Bone	13.00	....	....
Venable's Standard Acid Phosphate	12.00	....	....
Venable's Corn, Wheat and Grass Fertilizer	10.00	.82	1.00
Venable's B. B. P. Manure	9.00	1.65	1.00
Venable's 5 Per Cent Trucker	8.00	4.11	5.00
Venable's 4 Per Cent Trucker	8.00	3.29	4.00
Venable's H. G. Tobacco Fertilizer	8.00	2.47	3.00
Venable's Alliance Tobacco Manure, No. 1	8.00	2.06	3.00
Venable's Alliance Tobacco Manure, No. 2	8.00	1.65	2.00
Venable's Alliance Bone and Potash Mixture	8.00	....	4.00
Venable's Cotton Grower	8.00	2.06	3.00
Venable's Roanoke Special	8.00	2.06	3.00
Venable's Ideal Manure	8.00	1.65	5.00
Venable's Meal Mixture	8.00	1.65	2.00
Venable's Peanut Special	8.00	.82	4.00
Venable's Peanut Grower	8.00	....	4.00
Venable's 10 Per Cent Trucker	6.00	8.23	2.00
Venable's 6-6-6 Manure	6.00	4.94	6.00
High Grade Bone and Potash Mixture	10.00	....	4.00
Bone and Potash Mixture	10.00	....	2.00
Roanoke Mixture	9.00	2.26	2.00

Name and Address of Manufacturer and Name of Brand	Avail. Phos. Acid.	Nitrogen.	Potash.
Roanoke Meal Mixture	9.00	2.26	2.00
Ballard's Choice Fertilizer	8.00	2.47	3.00
Our Union Tobacco Fertilizer	8.00	1.65	4.00
Our Union Special Fertilizer	8.00	1.65	2.00
Planters' Bone Fertilizer	8.00	1.65	2.00
Nitrate of Soda	....	15.63	....
Special Top Dresser	....	7.30	3.00
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Pure German Kainit	....	....	12.00
Virginia-Carolina Chemical Co., Richmond, Va.—			
V.-C. C. Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
V.-C. C. Co.'s 14 Per Cent Acid Phosphate	14.00	....	....
V.-C. C. Co.'s Special High Grade Potash Mixture	12.00	....	6.00
V.-C. C. Co.'s H. G. Potash Mixture	12.00	....	5.00
V.-C. C. Co.'s 12-4 Grain Grower	12.00	....	4.00
V.-C. C. Co.'s Special Crop Grower	12.00	....	3.00
V.-C. C. Co.'s Grain Special	10.00	....	6.00
V.-C. C. Co.'s Standard Bone and Potash	10.00	....	5.00
V.-C. C. Co.'s Special Potash Mixture	10.00	....	4.00
V.-C. C. Co.'s Dissolved Bone and Potash	10.00	....	2.00
V.-C. C. Co.'s Cotton Grower	9.00	2.26	2.00
V.-C. C. Co.'s Farmers' Choice	8.00	3.29	4.00
V.-C. C. Co.'s Special	8.00	3.29	4.00
V.-C. C. Co.'s High Grade Tobacco Fertilizer	8.00	2.47	10.00
V.-C. C. Co.'s Monarch Brand	8.00	1.65	5.00
V.-C. C. Co.'s Corn and Peanut Special	8.00	1.65	2.00
V.-C. C. Co.'s Special Peanut Grower	8.00	1.00	4.00
V.-C. C. Co.'s Peanut Grower	8.00	.82	4.00
V.-C. C. Co.'s Potash Mixture for Peanuts	8.00	....	4.00
V.-C. C. Co.'s Truck Crop Fertilizer	7.00	4.12	7.00
V.-C. C. Co.'s Potash Potato Producer	7.00	3.29	8.00
V.-C. C. Co.'s Formula 44 for Bright Wrappers and Smokers	7.00	2.55	3.30
V.-C. C. Co.'s Special Truck Guano	6.00	4.12	7.00
V.-C. C. Co.'s High Grade Top Dresser	4.00	6.17	2.50
V.-C. C. Co.'s 10 Per Cent Top Dresser Extra H. G.	4.00	8.24	4.00
Allison & Addison's Fulton Acid Phosphate	14.00	....	....
Allison & Addison's I. X. L. Acid Phosphate	13.00	....	....
Allison & Addison's Standard Acid Phosphate,	12.00	....	....
Allison & Addison's Rocket Acid Phosphate	12.00	....	....
Allison & Addison's B. P. Potash Mixture	10.00	....	2.00
Allison & Addison's McGavock's Special Potash Mixture	10.00	....	2.00
Allison & Addison's Star Special Tobacco Manure	9.00	2.26	2.00
Allison & Addison's Star Brand Guano	9.00	1.65	1.00
Allison & Addison's Little Giant Grain and Grass Grower	9.00	.82	2.00
Allison & Addison's A. A. Guano	8.00	2.47	3.00
Allison & Addison's Anchor Brand Tobacco Fertilizer	8.50	2.26	2.00
Allison & Addison's Star Vegetable Brand Guano	8.00	3.71	4.00
Allison & Addison's Anchor Brand Fertilizer,	8.00	1.65	2.00
Allison & Addison's Old Hickory Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate	16.00	....	....
Atlantic and Virginia Fertilizer Co.'s Valley of Virginia Phosphate	14.00	....	....
Atlantic and Virginia Fertilizer Co.'s Crenshaw Acid Phosphate	13.00	....	....
Atlantic and Virginia Fertilizer Co.'s Our Acid Phosphate	12.00	....	....
Atlantic and Virginia Fertilizer Co.'s Eureka Bone and Potash Compound	10.00	....	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone Special for Tobacco	9.00	2.06	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Complete Manure	9.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Virginia Truckers	8.00	4.12	5.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Special for Tobacco	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Carolina Truckers	7.00	5.76	7.00
Charlotte Oil and Fertilizer Co.'s 15 Per Cent Acid Phosphate	15.00	....	....
Charlotte Oil and Fertilizer Co.'s Catawba Bone Phosphate	14.00	....	....
Charlotte Oil and Fertilizer Co.'s Charlotte Acid Phosphate	13.00	....	....
Charlotte Oil and Fertilizer Co.'s Dayvault's Special	12.00	....	6.00
Charlotte Oil and Fertilizer Co.'s Charlotte Dissolved Bone	12.00	....	....
Charlotte Oil and Fertilizer Co.'s Oliver's Perfect Wheat Grower	11.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s 10-2 Bone and Potash	10.00	....	2.00
Charlotte Oil and Fertilizer Co.'s High Grade Special Tobacco Fertilizer	9.00	2.06	2.00
Charlotte Oil and Fertilizer Co.'s Queen of the Harvest C. S. M	9.00	1.65	2.00
Charlotte Oil and Fertilizer Co.'s McCrary's Diamond Bone and Potash	9.00	....	3.00
Charlotte Oil and Fertilizer Co.'s Groom's Special Tobacco Fertilizer	8.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s Catawba Guano B. G	8.00	2.47	3.00
Charlotte Oil and Fertilizer Co.'s Special 3 Per Cent Guano C. S. M	8.00	2.47	2.00
Charlotte Oil and Fertilizer Co.'s Charlotte Ammoniated Guano B. G	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s Charlotte Ammoniated Guano C. S. M	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s King Cotton Grower	8.00	1.65	2.00
Davie & Whittle's Owl Brand High Grade Acid Phosphate	16.00	....	....
Davie & Whittle's Owl Brand High Grade Dissolved Bone	14.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate,	13.00	....	....
Davie & Whittle's Owl Brand Dissolved Bone,	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Davie & Whittle's Owl Brand Acid Phosphate with Potash	10.00	....	2.00
Davie & Whittle's Owl Brand High Grade 3 Per Cent Soluble Guano	9.00	2.06	3.00
Davie & Whittle's Owl Brand Special Tobacco Guano	9.00	2.06	2.00
Davie & Whittle's Owl Brand Truck Guano	8.00	4.94	5.00
Davie & Whittle's Owl Brand Guano for Tobacco	8.00	2.47	3.00
Davie & Whittle's Vinco Guano	8.00	1.65	3.00
Davie & Whittle's Owl Brand Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Durham Best Acid Phosphate	16.00	....	....
Durham Fertilizer Co.'s Standard High Grade Acid Phosphate	14.00	....	....
Durham Fertilizer Co.'s Excelsior Dissolved Bone Phosphate	14.00	....	....
Durham Fertilizer Co.'s Blacksburg Dissolved Bone	13.00	....	....
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official Acid Phosphate	13.00	....	....
Durham Fertilizer Co.'s Double Bone Phosphate	13.00	....	....
Durham Fertilizer Co.'s Durham Acid Phosphate	12.00	....	....
Durham Fertilizer Co.'s Great Wheat and Corn Grower	10.50	....	1.50
Durham Fertilizer Co.'s Diamond Wheat Mixture	10.00	....	3.00
Durham Fertilizer Co.'s Standard Wheat and Corn Grower	10.00	....	2.00
Durham Fertilizer Co.'s Blue Ridge Wheat Grower	10.00	....	2.00
Durham Fertilizer Co.'s Standard Wheat Grower	10.00	....	2.00
Durham Fertilizer Co.'s Durham Bone and Potash Mixture	10.00	....	2.00
Durham Fertilizer Co.'s L. & N. Special	9.00	2.47	2.00
Durham Fertilizer Co.'s Standard Guano	9.00	1.65	2.00
Durham Fertilizer Co.'s Durham Ammoniated Fertilizer	9.00	1.65	1.00
Durham Fertilizer Co.'s Special Plant and Truck Fertilizer	8.00	4.12	3.00
Durham Fertilizer Co.'s Durham High Grade,	8.00	3.29	4.00
Durham Fertilizer Co.'s Gold Medal Brand Guano	8.00	2.47	3.00
Durham Fertilizer Co.'s Yellow Leaf Tobacco Guano	8.00	2.47	3.00
Diamond Cotton-seed Meal Guano	8.00	2.47	3.00
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official Guano	8.00	2.06	3.00
Durham Fertilizer Co.'s Pride of Durham Tobacco Grower	8.00	2.06	3.00
Durham Fertilizer Co.'s Raw Bone Superphosphate for Tobacco	8.00	2.06	2.00
Durham Fertilizer Co.'s Raw Bone Superphosphate	8.00	2.06	1.50
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Durham Fertilizer Co.'s Genuine Bone and Peruvian Tobacco Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Blacksburg Soluble Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Progressive Farmer Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Carr's Special Wheat Grower	8.00	....	4.00
Durham Fertilizer Co.'s Best Potato Manure.	7.00	5.76	7.00
Lynchburg Guano Co.'s Ironside Acid Phosphate	16.00	....	....
Lynchburg Guano Co.'s Lynchburg High Grade Acid Phosphate	14.00	....	....
Lynchburg Guano Co.'s Arvonia Acid Phosphate	13.00	....	....
Lynchburg Guano Co.'s Spartan Acid Phosphate	12.00	....	....
Lynchburg Guano Co.'s Alpine Mixture	10.00	....	5.00
Lynchburg Guano Co.'s S. W. Special Bone and Potash Mixture	10.00	....	4.00
Lynchburg Guano Co.'s Dissolved Bone and Potash	10.00	....	2.00
Lynchburg Guano Co.'s Independent Standard.	8.50	1.65	2.00
Lynchburg Guano Co.'s Bright Belt Guano	8.00	2.47	3.00
Lynchburg Guano Co.'s Solid Gold Tobacco	8.00	2.26	4.00
Lynchburg Guano Co.'s New Era	8.00	1.65	3.00
Lynchburg Guano Co.'s Lynchburg Soluble	8.00	1.65	2.00
Lynchburg Guano Co.'s Lynchburg Soluble for Tobacco	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Reliable Acid Phosphate	14.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Best Acid Phosphate	13.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Soluble Bone	12.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Bone and Potash	10.00	....	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Trucker and Tomato Grower	8.00	4.12	5.00
Norfolk and Carolina Chemical Co.'s Amazon High Grade Manure	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Grower	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Amazon H. G. Special Tobacco Guano	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Cooper's Bright Tobacco Fertilizer	8.00	2.06	3.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Made Especially for Tobacco	8.00	2.06	2.00
Norfolk and Carolina Chemical Co.'s Crescent Brand Ammoniated Fertilizer	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s High Grade Acid Phosphate	14.00	....	....
Old Dominion Guano Co.'s Bone Phosphate	13.00	....	....
Old Dominion Guano Co.'s Royster's Acid Phosphate	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Old Dominion Guano Co.'s Obelisk Brand Bone and Potash	10.00	....	4.00
Old Dominion Guano Co.'s Planters' Bone and Potash Mixture	10.00	....	3.00
Old Dominion Guano Co.'s Old Dominion Alkaline Bone and Potash	10.00	....	2.00
Old Dominion Guano Co.'s Horne's Cotton Fertilizer	9.00	2.06	3.00
Old Dominion Guano Co.'s Standard Raw Bone Soluble Guano	9.00	1.65	1.00
Old Dominion Guano Co.'s Farmers' Friend High Grade Fertilizer	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Friend Special Tobacco Fertilizer	8.00	2.47	3.00
Old Dominion Guano Co.'s Osceola Tobacco Guano	8.00	2.06	3.00
Old Dominion Guano Co.'s Farmers' Friend Fertilizer	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Special Wheat Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Tobacco Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Bullock's Cotton Grower	8.00	1.65	2.00
Old Dominion Guano Co.'s Millers' Special Wheat Mixture	8.00	....	4.00
Old Dominion Guano Co.'s Old Dominion 7-7-7 Truck Guano	7.00	5.76	7.00
Old Dominion Guano Co.'s Old Dominion Potato Manure	7.00	4.12	8.00
Old Dominion Guano Co.'s 7 Per Cent Truck Fertilizer	6.00	5.76	6.00
Old Dominion Guano Co.'s Old Dominion 6-7-5 Truck Guano	6.00	5.76	5.00
Old Dominion Guano Co.'s Old Dominion Special Sweet Potato Guano	6.00	1.65	6.00
Old Dominion Guano Co.'s 10 Per Cent Truck Fertilizer	5.00	8.24	2.50
Powers, Gibbs & Co.'s Almont High Grade Acid Phosphate	14.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Best Acid Phosphate	13.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate	12.00	....	....
Powers, Gibbs & Co.'s Acid Phosphate and Potash	10.50	....	1.50
Powers, Gibbs & Co.'s Almont Wheat Mixture.	10.00	....	3.00
Powers, Gibbs & Co.'s Dissolved Bone and Potash	10.00	....	2.00
Powers, Gibbs & Co.'s Cotton Seed Meal Standard Guano	9.00	2.47	2.00
Powers, Gibbs & Co.'s Truck Farmers' Special Ammoniated Guano	8.00	3.29	5.00
Powers, Gibbs & Co.'s Cotton Brand Ammoniated Dissolved Bone	8.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Powers, Gibbs & Co.'s Old Kentucky High Grade Manure	8.00	2.47	3.00
Powers, Gibbs & Co.'s Cotton Belt Ammoniated Guano	8.00	2.47	2.00
Powers, Gibbs & Co.'s Carolina Golden Belt Ammoniated Guano for Tobacco	8.00	2.06	3.00
Powers, Gibbs & Co.'s Powers' Ammoniated Guano	8.00	2.06	2.00
Powers, Gibbs & Co.'s Gibbs' Ammoniated Guano	8.00	2.06	1.50
Powers, Gibbs & Co.'s Almont Soluble Ammoniated Guano	8.00	1.65	2.00
Powers, Gibbs & Co.'s Cotton Seed Meal Soluble Ammoniated Guano	8.00	1.65	2.00
Powers, Gibbs & Co.'s Eagle Island Ammoniated	8.00	1.65	2.00
Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate	16.00	....	....
Southern Chemical Co.'s Chick's 16 Per Cent Acid Phosphate	16.00	....	....
Southern Chemical Co.'s Red Cross 14 Per Cent Acid Phosphate	14.00	....	....
Southern Chemical Co.'s Victor Acid Phosphate	13.00	....	....
Southern Chemical Co.'s Chatham Acid Phosphate	13.00	....	....
Southern Chemical Co.'s Reaper Grain Application	12.00	....	3.00
Southern Chemical Co.'s Tar Heel Acid Phosphate	12.00	....	....
Southern Chemical Co.'s Horseshoe Acid Phosphate	12.00	....	....
Southern Chemical Co.'s Quickstep Bone and Potash	11.00	....	5.00
Southern Chemical Co.'s Solid South	10.00	....	6.00
Southern Chemical Co.'s Winner Grain Mixture	10.00	....	4.00
Southern Chemical Co.'s Farmers' Pride Bone and Potash	10.00	....	3.00
Southern Chemical Co.'s Winston Bone and Potash Compound	10.00	....	2.00
Southern Chemical Co.'s Mammoth Corn Grower	10.00	....	2.00
Southern Chemical Co.'s Mammoth Wheat and Grass Grower	10.00	....	2.00
Southern Chemical Co.'s Sun Brand Guano	9.00	2.06	5.00
Southern Chemical Co.'s George Washington Plant Bed Fertilizer for Tobacco	8.00	2.47	2.50
Southern Chemical Co.'s Pilot Ammoniated Guano Special for Tobacco	8.00	2.06	3.00
Southern Chemical Co.'s Electric Tobacco Guano	8.00	1.65	2.00
Southern Chemical Co.'s Electric Standard Guano	8.00	1.65	2.00
Southern Chemical Co.'s Yadkin Complete Fertilizer	8.00	1.65	2.00
Southern Chemical Co.'s Chick's Special Wheat Compound	8.00	....	4.00
J. G. Tinsley & Co.'s Powhatan Acid Phosphate	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
J. G. Tinsley & Co.'s Tinsley's Dissolved S. C. Bone	13.00	....	....
J. G. Tinsley & Co.'s Stonewall Brand Acid Phosphate	12.00	....	....
J. G. Tinsley & Co.'s Tinsley's Bone and Potash Mixture	10.00	....	2.00
J. G. Tinsley & Co.'s Tinsley's Tobacco Fertilizer	8.00	3.29	2.50
J. G. Tinsley & Co.'s Richmond Brand Guano,	8.00	2.47	3.00
J. G. Tinsley & Co.'s Killickinick Tobacco Mixture	8.00	2.06	3.00
J. G. Tinsley & Co.'s Lee Brand Guano	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Brand Guano,	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Tobacco Guano,	8.00	1.65	2.00
J. G. Tinsley & Co.'s Tinsley's Special Irish Potato Guano	6.00	5.76	6.00
J. G. Tinsley & Co.'s Tinsley's 7 Per Cent Ammoniated Guano for Beans, Peas, Cabbage, Strawberries, etc	6.00	5.76	6.00
J. G. Tinsley & Co.'s Tinsley's Irish Potato Guano	6.00	4.94	6.00
J. G. Tinsley & Co.'s Tinsley's Strawberry Grower	6.00	3.29	4.00
J. G. Tinsley & Co.'s Tinsley's Top Dresser	5.00	9.06	....
J. G. Tinsley & Co.'s Tinsley's 10 Per Cent Truck Guano	5.00	8.24	2.50
S. W. Travers & Co.'s Champion Acid Phosphate	16.00	....	....
S. W. Travers & Co.'s Travers' Dissolved Acid Phosphate	14.00	....	....
S. W. Travers & Co.'s Standard Dissolved S. C. Bone	13.00	....	....
S. W. Travers & Co.'s Capital Dissolved Bone,	12.00	....	....
S. W. Travers & Co.'s Capital Bone and Potash Compound	10.00	....	2.00
S. W. Travers & Co.'s Capital Truck Fertilizer,	8.00	3.29	3.00
S. W. Travers & Co.'s Capital Tobacco Fertilizer	8.00	3.29	3.00
S. W. Travers & Co.'s Big Leaf Tobacco Grower, H. G	8.00	2.47	3.00
S. W. Travers & Co.'s Capital Cotton Fertilizer,	8.00	2.06	2.00
S. W. Travers & Co.'s National Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s National Special Tobacco Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s Beef, Blood and Bone Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s Travers' Special Wheat Compound	8.00	....	4.00
S. W. Travers & Co.'s Travers' 7 Per Cent Truck Fertilizer	6.00	5.76	5.00
Virginia State Fertilizer Co.'s Bull Run Acid Phosphate	16.00	....	....
Virginia State Fertilizer Co.'s Gilt Edge Brand Acid Phosphate	14.00	....	....
Virginia State Fertilizer Co.'s Clipper Brand Acid Phosphate	13.00	....	....
Virginia State Fertilizer Co.'s Lurich Acid Phosphate	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia State Fertilizer Co.'s Alps Brand Acid Phosphate	12.00	....	....
Virginia State Fertilizer Co.'s Mountain Top Bone and Potash	10.00	....	5.00
Virginia State Fertilizer Co.'s XX Potash Mixture	10.00	....	4.00
Virginia State Fertilizer Co.'s Virginia State Dissolved Bone and Potash	10.00	....	2.00
Virginia State Fertilizer Co.'s Number One Soluble Guano	9.00	1.65	2.00
Virginia State Fertilizer Co.'s Highland King,	9.00	1.65	1.00
Virginia State Fertilizer Co.'s Gamecock Special for Tobacco	8.50	1.65	2.00
Virginia State Fertilizer Co.'s Virginia State High Grade Tobacco Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Bull Dog Soluble Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Dunnington's Special Formula for Tobacco	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Peerless Tobacco Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Buffalo Guano,	8.00	2.06	3.00
Virginia State Fertilizer Co.'s Austrian Tobacco Grower	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Gilt Edge Special Tobacco Guano	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Virginia State Guano	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Battle Axe Tobacco Guano	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Gilt Edge Brand Dissolved Bone and Potash	8.00	....	4.00
Sludge Acid Phosphate	14.00	....	....
Fulp's Acid Phosphate	13.00	....	....
Goodman's Special Potash Mixture	12.00	....	5.00
Battle's Crop Grower	12.00	....	3.00
Almont Acid Phosphate	12.00	....	....
Virginia 11-5 Bone and Potash	11.00	....	5.00
Sovereign Crop Producer	10.00	1.65	2.00
Ford's Wheat and Corn Guano	10.00	.82	2.50
Great Texas Cotton Grower Soluble Guano	9.00	2.47	4.00
Jeffreys' High Grade Guano	9.00	2.47	3.00
Southern Cotton Grower	9.00	2.29	2.00
Best's Special Cotton Grower	9.00	2.26	2.00
Best's H. G. Cotton and Tobacco Grower	8.00	2.47	3.00
Prolific Cotton Grower	9.00	2.26	2.00
White Stem C. S. M.	9.00	2.26	2.00
Bumper Crop Grower	9.00	2.06	5.00
Star Brand Special H. G.	9.00	2.06	5.00
Cock's Soluble Guano High Grade Animal Bone	9.00	1.85	3.00
Reliable Cotton Brand Fertilizer	9.00	1.65	3.00
North State Guano C. S. M.	9.00	1.65	1.00
Bigelow's Crop Guano	9.00	.82	3.00
Burnhardt's Grain and Crop Guano	9.00	.82	3.00
McCormick's Wheat and Grain Guano	9.00	.82	3.00
Little Giant Grain and Grass Grower	9.00	.82	2.00
Farmers' Friend Favorite Fertilizer Special	8.50	1.65	2.00
Farmers' Success	8.00	2.47	4.00
Powhatan Crop Mixture	8.50	1.65	1.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Pelican Truck Grower (1,000 pounds Peruvian Guano to the ton)	8.00	4.12	5.00
Carr's 8-4-4 Crop Grower	8.00	3.29	4.00
Jumbo Crop Grower (1,000 pounds Peruvian Guano to the ton)	8.00	2.48	3.00
Lion's High Grade Tobacco Fertilizer	8.00	2.47	4.00
Oldham's Special Compound for Tobacco, H. G.	8.00	2.47	3.00
Blake's Best	8.00	2.47	3.00
Royal High Grade Fertilizer	8.00	2.47	3.00
Special High Grade Tobacco Fertilizer	8.00	2.47	3.00
Adams' Special	8.00	2.47	3.00
Peruvian H. G. Tobacco Guano	8.00	2.47	3.00
Zeno Special Compound for Tobacco, H. G.	8.00	2.47	3.00
Gold Medal H. G. Tobacco Guano	8.00	2.47	3.00
Atlas Guano C. S. M.	8.00	2.47	2.50
Admiral	8.00	2.47	2.50
Good Luck C. S. M.	8.00	2.47	2.50
Split Silk C. S. M.	8.00	2.47	2.50
Myatt's Special High Grade Fertilizer	8.00	2.29	3.00
Orange Grove Guano	8.00	2.26	2.50
Delta C. S. M.	8.00	2.26	2.50
Royal Crown	8.00	2.26	2.00
Pace's Special 5 Per Cent Potato Guano	8.00	2.06	5.00
Blue Star C. S. M.	8.00	2.06	3.00
Superlative C. S. M. Guano	8.00	2.06	3.00
Smith's Irish Potato Guano	8.00	1.65	10.00
Winston Special for Cotton	8.00	1.65	2.00
Diamond Dust C. S. M.	8.00	1.65	2.00
Plant Food C. S. M.	8.00	1.65	2.00
Wilson's Standard C. S. M.	8.00	1.65	2.00
Ajax C. S. M. Guano	8.00	1.65	2.00
Farmers' Favorite Fertilizer C. S. M.	8.00	1.65	2.00
Parker & Hunter's Special	8.00	1.65	4.00
Charlotte Oil and Fertilizer Co.'s The Leader B. G.	8.00	1.65	2.00
Jones' Grain Special	8.00	....	4.00
Konqueror H. G. Truck Fertilizer	7.00	4.12	5.00
Pasquotank Trucker	7.00	3.29	8.00
Invincible High Grade Fertilizer	6.00	4.12	7.00
Sulphate of Ammonia	....	20.59	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.82	....
Fish Scrap	....	8.24	....
Muriate of Potash	....	....	49.00
Manure Salts	....	....	20.00
Genuine German Kainit	....	....	12.00
Thomas Wakefield, Friendship, N. C.—			
Bone Meal .....Total	21.73	4.12	....
Williams & Clark Fertilizer Co., Charleston, S. C.—			
Standard Americus Ammoniated Bone Superphosphate	9.00	1.85	1.00
Winborne Guano Co., Norfolk, Va.—			
Standard 16 Per Cent Acid Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
Soluble Bone and Potash	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Winborne's 3-8-4 Guano	8.00	2.47	4.00
Winborne's Tobacco Guano	8.00	2.47	3.00
Winborne's Excelsior Guano	8.00	1.65	2.00
Winborne's Eureka Guano	8.00	1.65	2.00
Winborne's Triumph Guano	8.00	1.65	2.00
Winborne's Special Peanut Guano	8.00	.82	4.00
Winborne's 7 Per Cent Guano	5.00	5.75	5.00
King Taminy Guano	8.00	2.47	3.00
Farmers' Select Guano	8.00	2.06	3.00
Nitrate of Soda	....	15.65	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
T. W. Wood & Sons, Richmond, Va.—			
Wood's Pure Animal Bone.....Total	23.00	2.47	....
Standard H. G. Acid Phosphate	16.00	....	....
Standard High Grade Acid Phosphate	14.00	....	....
Standard Corn Fertilizer	10.00	.82	1.00
Standard Bone and Potash Mixture	10.00	....	2.00
Standard Crop Grower	9.00	.82	2.00
Standard Wheat Fertilizer	9.00	.82	2.00
Standard High Grade Trucker Fertilizer	8.00	4.94	6.00
Standard Vegetable Fertilizer	8.00	2.47	3.00
Standard Potash Fertilizer	8.00	1.65	5.00
Standard Grain and Grass Fertilizer	8.00	1.65	2.00
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Wood's Lawn Enricher	6.00	2.47	3.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00
Wessel, Duval & Co., New York.—			
Nitrate of Soda	....	14.85	....
The J. R. Young Fertilizer Co., Norfolk, Va.—			
High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Bone and Potash	10.00	....	2.00
J. R. Young's 2-$8\frac{1}{2}$-9-2 Special Guano	9.00	2.26	2.00
J. R. Young's Special 3-8-3 Guano for Cotton	8.00	2.47	3.00
J. R. Young's New Process 3-8-3 Guano for Tobacco	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Cotton, Corn and Peanuts	8.00	1.65	2.00
J. R. Young's Special Guano for Potatoes	6.00	4.11	5.00
J. R. Young's Improved Fish and Bone Manure for all Crops	6.00	3.29	4.00
J. R. Young's 4-4-6 Special for Tobacco	4.00	3.29	6.00
Genuine German Kainit	....	....	12.00
Fremont H. G. Guano	8.00	3.29	4.00

LEAF TOBACCO SALES FOR FEBRUARY, 1910.

Pounds sold for producers, first hand	9,471,293
Pounds sold for dealers	304,689
Pounds resold for warehouses	446,610
Total	10,222,592

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. APRIL, 1910. Number 4.

I. ANALYSES OF FERTILIZERS—FALL AND SPRING, 1909-10.

II. REGISTRATION OF FERTILIZERS.

PUBLISHED MONTHLY AND SENT [illegible]IZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SEC[illegible]LASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Melville	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
W. H. Eaton	Assistant Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
E. P. Wood	Assistant Veterinarian.
*W. E. Hearn	Soil Survey.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, N. C., April 10, 1910.

SIR:—I submit herewith analyses of fertilizers made in the laboratory of samples collected during the fall of 1909 and spring of 1910. These analyses show fertilizers to be about as heretofore, and to be, generally, what was claimed for them. I recommend that it be issued as the April Bulletin. Very respectfully,

B. W. KILGORE,
State Chemist.

To HON. WILLIAM A. GRAHAM,
Commissioner of Agriculture.

I. ANALYSES OF FERTILIZERS—FALL AND SPRING, 1909-10.

By B. W. KILGORE,

W. G. HAYWOOD, J. M. PICKEL, J. Q. JACKSON AND W. H. STROWD.

The analyses presented in this BULLETIN are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during the fall of 1909 and the spring of 1910. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the BULLETIN with the claims made for the fertilizers actually used, the farmer can know by, or before, the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

TERMS USED IN ANALYSES.

Water-soluble Phosphoric Acid.—Phosphate rock, as dug from the mines, mainly in South Carolina, Florida and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural, state the phosphate has three parts of lime united to the phosphoric acid (called by chemists tri-calcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

Reverted Phosphoric Acid.—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

Available Phosphoric Acid is made up of the water-soluble and reverted; it is the sum of these two.

Water-soluble Ammonia.—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-

seed meal, dried blood, tankage, and fish scrap. The first two of these (nitrate of soda and sulphate of ammonia) are easily soluble in water and become well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

Organic Ammonia.—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay, will determine the quickness of their action as fertilizers. With short season, quick-growing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion, or all, of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

Total Ammonia is made up of the water-soluble and organic; it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

VALUATIONS.

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid and potash in the materials supplying them. These values are only approximate (as the costs of fertilizing materials are liable to change, as other commercial products are), but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacturers.

Relative value per ton, or the figures showing this, represents the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid and potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

The values used last season were:

VALUATIONS FOR 1909.

In Unmixed or Raw Materials.

For phosphoric acid in acid phosphate....	4	cents per pound.
For phosphoric acid in bone meal, basic slag and Peruvian guano.....	3½	cents per pound.
For nitrogen	18	cents per pound.
For potash	5	cents per pound.

In Mixed Fertilizers.

For phosphoric acid.....	4½	cents per pound.
For nitrogen	19½	cents per pound.
For potash	5½	cents per pound.

The valuations decided on this season, for reasons already given, are:

VALUATIONS FOR 1910.

In Unmixed or Raw Materials.

For phosphoric acid in acid phosphate.....	4	cents per pound.
For phosphoric acid in bone meal, basic slag and Peruvian guano.....	3½	cents per pound.
For nitrogen.....	18	cents per pound.
For potash.....	5	cents per pound.

In Mixed Fertilizers.

For available phosphoric acid.....	4½	cents per pound.
For nitrogen.....	19½	cents per pound.
For potash.....	5½	cents per pound.

HOW RELATIVE VALUE IS CALCULATED.

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8—2—1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

Percentage, or Lbs. in 100 Lbs.	Value Per 100 Lbs.	Value Per Ton, 2,000 Lbs.
8 pounds available phosphoric acid at 4½ cents...	0.36 ×20=	$7.20
2 pounds potash at 5½ cents.....	0.11 ×20=	2.20
1.65 pounds nitrogen at 19½ cents.....	0.321×20=	6.42
Total value	0.791×20=	$15.82

Freight and merchant's commission must be added to these prices. Freight rates from the seaboard and manufacturing centers to interior points are given in the following table:

FREIGHT RATES FROM THE SEABOARD TO INTERIOR POINTS.—From the Published Rates of the Associated Railways of Virginia and the Carolinas. In car-loads, of not less than ten tons each, per ton of 2,000 pounds. Less than car-loads, add 20 per cent.

Destination.	From Wilmington, N. C.	From Norfolk and Portsmouth, Va.	From Charleston, S. C.	From Richmond, Va.
Advance	$ 3.20	$ 3.20	$ 3.40	$ 3.20
Apex	2.70		3.80	3.00
Ashboro	3.20	3.20	3.60	3.20
Asheville	4.00	4.00	4.00	4.00
Chapel Hill	2.95	3.20	3.90	3.20
Charlotte	2.65	3.20	2.85	3.20
Clayton	2.48	2.86	3.63	2.80
Cherryville	3.85	3.60	3.40	3.63
Clinton	1.60	3.00	3.20	3.00
Creedmoor	3.00	3.00	3.80	3.00
Cunningham	3.00	2.40	4.00	2.40
Dallas	3.00	3.60	3.40	3.60
Davidson College	3.00	3.20	2.20	3.20
Dudley	1.70	3.00	3.20	3.00
Dunn	2.00	2.80	3.20	2.80
Durham	2.80	2.83	3.20	2.83
Elkin	3.60	3.20	3.60	3.20
Elm City	2.10	2.60	3.20	2.60
Fair Bluff	1.60	3.80	2.40	3.80
Fayetteville	1.80	3.00	3.00	3.00
Forestville	2.85	3.00	3.80	3.06
Gastonia	3.12	3.25	3.12	3.25
Gibson	2.10	3.50	2.10	3.50
Goldsboro	1.80	2.80	3.20	2.80
Greensboro	2.96	3.00	3.40	3.00
Hamlet	2.00	3.00	3.60	3.00
Henderson	3.00	2.83	3.55	2.83
Hickory	3.20	3.60	3.20	3.60
High Point	3.00	3.08	3.40	3.08
Hillsboro	2.88	2.88	2.68	2.88
Kernersville	3.00	3.00	3.40	3.00
Kinston	2.10	2.80	3.50	2.80
Laurel Hill	1.90	2.40	3.80	3.40
Laurinburg	1.90	3.40	3.80	3.40
Liberty	2.72	3.60	3.80	3.60
Louisburg	2.95	3.00	3.80	3.00
Lumberton	1.60	3.60	3.70	3.60
Macon	3.05	3.00	3.85	3.00
Madison	3.00	3.00	3.40	3.00
Matthews	2.60	3.20	3.20	3.20
Maxton	1.80	3.40	2.70	3.40
Milton	3.44	2.40	4.00	2.40
Mocksville	3.36	3.20	3.40	3.20
Morven	2.55	3.60	2.50	3.60
Mount Airy	3.20	3.40	3.80	3.40
Nashville	2.30	2.90	3.40	2.90
New Bern	1.25	1.75	3.95	1.75
Norwood	3.68	3.20	3.20	2.23
Oxford	3.04	2.83	3.55	2.83
Pineville	2.77	3.25	3.00	3.20
Pittsboro	2.60	3.30	4.10	3.30
Polkton	2.40	3.00	2.20	3.00
Raleigh	2.56	2.83	3.40	2.83
Reidsville	3.00	2.96	3.40	2.36
Rockingham	2.10	3.00	3.80	3.00
Rocky Mount	2.20	2.50	3.40	2.50
Ruffin	3.28	2.80	3.40	2.20
Rural Hall	3.28	3.20	3.60	3.20
Rutherfordton	3.05	3.65	3.05	3.65
Salisbury	3.25	3.20	3.20	3.20
Sanford	2.10	3.00	3.40	3.00
Selma	2.10	2.80	3.20	2.80
Shelby	2.90	3.60	3.90	3.60
Siler City	2.60	3.60	3.80	3.60
Smithfield	2.20	2.80	3.20	2.80
Statesville	3.50	3.20	3.60	3.20
Stem	2.95	2.83	3.80	2.83
Tarboro	2.30	2.40	3.00	2.40
Waco	2.90	3.60	3.40	3.60
Wadesboro	2.30	3.00	2.50	3.00
Walnut Cove	3.00	3.00	3.40	3.00
Warrenton	3.05	3.25	4.10	3.25
Warsaw	1.50	3.00	3.20	3.00
Washington	2.65	1.75	2.25	1.50
Weldon	2.95	1.90	3.85	1.90
Wilson	2.00	2.60	3.20	2.60
Winston-Salem	3.00	3.00	3.40	3.00

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.							
	Brands claiming			8.00			1.65	2.00	2.00	$ 15.82
7917	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Lumberton	8.52	.80	1.14	1.94	2.36	2.05	17.49
7880	Cowell, Swann & McCotter Co., Bayboro, N. C.	Bone and Fish Guano	Washington	8.66	.38	1.32	1.70	2.07	2.61	17.29
7866	Eastern Cotton Oil Co., Hertford, N. C.	Perquimans Favorite	Hertford	8.18	.46	1.49	1.86	2.26	3.83	18.83
7943	Goldsboro Oil Mill, Goldsboro, N. C.	Goldsboro Oil Mill Standard	Goldsboro	8.48	.42	1.28	1.70	2.07	2.28	16.77
7833	Harrell, S. B., & Co., Norfolk, Va.	Harrell's Champion Cotton and Peanut Grower.	Edenton	8.14	1.20	.60	1.80	2.19	1.99	16.53
7910	Martin, D. B., & Co., Baltimore, Md.	Martin's Carolina Cotton Fertilizer.	Lumberton	8.44	1.24	.58	1.82	2.21	1.92	16.81
7901	Meadows, E. H. & J. A., New Bern, N. C.	Meadows' Cotton Guano	New Bern	8.34	.76	1.04	1.80	2.19	2.48	17.25
7905	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Craven Cotton Guano	New Bern	8.30	.32	1.64	1.96	2.38	2.41	17.76
7878	Pamlico Chemical Co., Washington, N. C.	Pamlico Cotton Guano	Washington	8.59	.28	1.54	1.82	2.21	2.66	17.75
7875	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Edenton	8.05	1.22	.64	1.86	2.26	2.05	16.75
7955	Rasin-Monumental Co., Baltimore, Md.	Rasin's Empire Guano	Raleigh	8.69	.86	1.04	1.90	2.31	1.89	17.31
7861	Royster, F. S., Guano Co., Norfolk, Va.	Farmers Bone Fertilizer	Greenville	7.95	.84	.90	1.74	2.11	2.00	16.14
7947	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Fertilizer	Ayden	8.24	1.26	.70	1.96	2.38	2.02	17.28
7881	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Washington	8.00	.94	.68	1.62	1.97	1.95	15.66
7884	----do	Genuine Slaughterhouse Bone	Washington	8.04	92	.70	1.82	1.97	1.94	15.69

7961	----do	Norf. and Car. Chem. Co.'s Genuine Slaughterhouse Bone Guano.	Washington	8.00	.58	1.22	1.80	2.19	2 00	16 42
7883	----do	Stonewall Guano	Washington	8.07	.84	.70	**1.54**	**1 87**	**1.87**	**15.32**
7895	----do	Wilson's Standard	Farmville	**7.97**	.52	1.24	1.76	2.14	2.06	17.20
7836	Winborne Guano Co., Norfolk, Va.	Winborne's Excelsior Guano	Edenton	**7.99**	1.06	.80	1.86	2.26	2.34	17.46
	Brand claiming			**8.00**			**1.00**	**1.22**	**4 00**	**15.50**
7874	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Wheat, Corn and Peanut Manure.	Edenton	8.22	.86	.34	1.20	1 46	4.04	16.52
	Brand claiming			**8 00**			**2.06**	**2.50**	**2.50**	**16.75**
7902	Meadows, E. H. & J. A., New Bern, N. C.	Meadows' All Crop Guano	New Bern	8.61	.78	1 30	2.08	2.53	2 42	18.52
	Brands claiming			**8 00**			**2.06**	**2.50**	**3 00**	**19.43**
7900	Meadows, E. H. & J. A., New Bern, N. C.	Meadows' Roanoke Guano	New Bern	8.59	.50	1.32	**1.82**	**2.21**	3.27	19.42
7904	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Jones County Premium Crop Grower.	New Bern	8.58	.36	1.80	2.16	2.63	**2.71**	19.13
7894	Va.-Car. Chemical Co., Richmond, Va.	Durham Fert. Co.'s N. C. Farmers' Alliance Official Guano.	Farmville	**7.85**	1.44	.94	2.38	2.89	3.84	20.57
7954	----do	Superlative Guano	Raleigh	8.80	1.00	1.28	2.28	2.77	3.94	21.15
	Brands claiming			**8.00**			**2.47**	**3.00**	**3.00**	**20 13**
7907	Acme Mfg. Co., Wilmington, N. C.	Pee Dee Special	Lumberton	8.30	1.42	1 10	2.52	3.06	3.17	20.78
7830	American Fertilizer Co., Norfolk, Va.	American Eagle Guano	Selma	9.38	1.52	1.02	2.54	3.09	**2.90**	21.54
7908	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer.	Lumberton	**7.75**	1.38	1.00	**2.38**	**2 89**	3.07	**19 63**
7842	Baugh & Sons Co., Norfolk, Va.	Grand Rapids High Grade Truck Guano.	Maxton	8.64	1.52	1.10	2.62	3.19	3.19	21.50
7844	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Best	Maxton	8.30	1.36	1 26	2.62	3.19	3.29	21 51
7893	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Horne's Best	Farmville	8.20	.96	1.52	2.48	3.02	3.33	20.71
7845	Floradora Guano Co., Laurinburg, N. C.	Oceola	Maxton	9.34	.94	1.42	**2.36**	**2.87**	3.73	21.71
7850	North Carolina Cotton Oil Co., Wilmington, N. C.	Wilmington High Grade	Maxton	8.35	1.02	1.38	**2 40**	**2 92**	3.08	20.26
7935	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont High Grade Ammoniated Bone and Potash.	Plymouth	8.56	1.44	1.08	2.52	3.06	3 45	21 33
7834	Pocomoke Guano Co., Norfolk, Va.	Harvey High Grade Monarch	Edenton	8.27	1.84	.90	2.74	3 33	3 05	21 48
7862	Robertson Fertilizer Co., Norfolk, Va.	Big Cropper High Grade Guano	Greenville	**7.98**	1.62	.94	2.56	3.11	3.32	20 82
7942	Southern Cotton Oil Co., Goldsboro, N. C.	Special Cotton Grower C. S. M.	Goldsboro	**7.22**	.70	1 92	2 62	3 19	3 78	20.87

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.							
	Brands claiming			**8.00**			**2.47**	**3.00**	**3.00**	**$ 20.13**
7852	Southern Exchange Co., Maxton, N. C.	Jack's Best Fertilizer	Maxton	8.36	1.88	.88	2.76	3.36	3.37	21 99
7948	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Cotton Special	Ayden	8.90	1.74	.86	2.60	3.16	**2.92**	21.36
7938	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Amazon High Grade Manure.	Selma	8.34	1.56	1.00	2.56	3.11	**2 57**	20 32
7919	----do	Farmers Success	Lumberton	8.40	1.94	1.02	2.96	3 60	3.99	24.62
7835	Winborne Guano Co., Norfolk, Va.	Winborne King Farming Guano	Edenton	8.20	2.02	.96	2.98	3.62	3.00	22.30
	Brand claiming			**8.00**			**2.47**	**3 00**	**4 00**	**21.23**
7916	Southern Exchange Co., Maxton, N. C.	Bull of the Woods	Lumberton	8.12	1.86	.66	2.52	3.06	4 14	21.69
	Brand claiming			**8 00**			**2.47**	**3.00**	**10 00**	**27.83**
7843	Baugh & Sons Co., Norfolk, Va.	Baugh's Fruit and Berry Guano	Maxton	8.28	1.86	.78	2.64	3.21	10.35	29.13
	Brands claiming			**8 00**			**3.30**	**4.00**	**4.00**	**24 47**
7909	Baugh & Sons Co., Norfolk, Va.	Baugh's Fish, Bone and Potash	Lumberton	8.25	2.10	1.26	3.36	2.87	4.34	25.30
7864	Eastern Cotton Oil Co., Hertford, N. C.	Mat White Special	Hertford	**7.82**	1.50	1.88	3.38	2.89	4.44	**23.12**
7846	Floradora Guano Co., Laurinburg, N. C.	Floradora	Maxton	8.99	1.88	1.38	3.26	3.96	4.60	25.84
7849	Miller Fertilizer Co., Baltimore, Md.	Miller's Irish Potato	Maxton	8.03	2.58	1.22	3.80	4 62	4 42	26.91
7853	Swift Fertilizer Works, Atlanta, Ga.	Swift's Monarch Vegetable Grower	Maxton	8.72	1.36	1.72	3.08	3.74	**3.89**	**24 25**

	Brand claiming			**8.00**			**4.12**	**5.00**	**5.00**	**28.77**
7903	Meadows, E. H. & J. A., Co., New Bern, N. C.	Labos Guano	New Bern	8.17	2.04	1.94	**3.94**	**4.79**	5.55	28.82
	Brand claiming			**8.00**			**4.12**	**5.00**	**7 00**	**30.97**
7851	Southern Exchange Co., Maxton, N. C.	McKinnon's Special Truck Formula.	Maxton	8.04	3.32	.88	4.20	5.11	7.21	31.55
	Brand claiming			**8.00**			**5.77**	**7.00**	**5 00**	**35 20**
7888	Bragaw Fertilizer Co., Washington, N. C.	Riverview Trucker	Washington	8.03	3.28	2.62	5.90	7.17	5 49	35.71
	Brands claiming			**9.00**			**2.26**	**2.75**	**2 00**	**19.11**
7892	Pamlico Chemical Co., Washington, N. C.	Prosperity Cotton Grower	Washington	10.01	.44	1.88	2.32	2.82	2.84	21.18
7913	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Meal Mixture	Lumberton	9.20	.90	1.38	2.28	2.77	2.10	19.48
	Brand claiming			**9.00**			**2.88**	**3.50**	**5 00**	**24.83**
7856	American Fertilizer Co., Norfolk, Va.	Pitt County Special Fertilizer	Greenville	9.19	1.94	1.02	2.96	3.60	5.26	25.60
	Brand claiming			**7.00**			**3.30**	**4 00**	**5.00**	**24.87**
7838	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Pasquotank Trucker	Elizabeth City	7.34	1.78	1.52	3.30	4.00	8.32	28.63
	Brand claiming			**7.00**			**3.30**	**4.00**	**8.00**	**27.97**
7931	Baugh & Sons Co., Norfolk, Va.	Glover's Special Potato Guano	Elizabeth City	7.46	2.50	.98	3.48	4.23	**7.97**	29.05
	Brand claiming			**7.00**			**4.12**	**5.00**	**5.00**	27.87
7832	American Fertilizer Co., Norfolk, Va.	American Irish Potato Grower	Elizabeth City	7.17	2.98	1.06	**4 04**	4.91	**4 49**	27.15
	Brands claiming			**7.00**			**4.12**	**5 00**	**8.00**	**31.17**
7887	Bragaw Fertilizer Co., Washington, N. C.	Pamlico Trucker	Washington	7.73	1.98	2.26	4.24	5.15	7.75	32.02
7898	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Potato Guano	New Bern	7.50	2.30	1.54	**3.84**	**4.67**	8.94	31.56
7837	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Potato Manure.	Hertford	8.32	2.58	.94	**3.52**	**4 28**	**6.91**	28.82
	Brand claiming			**6.00**			**1.65**	**2.00**	**2.00**	**14 03**
7873	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Bone and Potash Compound for All Crops.	Elizabeth City	7.95	.98	.70	1.68	2.04	2.10	16 02
	Brands claiming			**8.00**			**4 12**	**5.00**	**2 00**	**23 67**
7932	Baugh & Sons Co., Norfolk, Va.	Baugh's 5-6-5 Guano	Elizabeth City	6.29	2.98	1.06	**4 04**	**4 91**	5.45	27 41
7869	Piedmont-Mt. Airy Guano Co., Norfolk, Va.	Piedmont Early Trucker	New Bern	6.20	2.38	1.32	**3 70**	**4 50**	**4 88**	25.38

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.							
	Brands claiming			**6.00**			**4.12**	**5.00**	**7 00**	**$ 29.17**
7831	American Fertilizer Co., Norfolk, Va.	Special Potato Manure	Elizabeth City	6.25	3.18	.76	**3.94**	**4.79**	**6.41**	**28.04**
7929	Baugh & Sons Co., Norfolk, Va.	Baugh's Peruvian Guano Substitute for Potatoes, etc.	Elizabeth City	6.54	3.20	.94	4 14	5.03	**6.96**	29 69
7897	Martin, D. B., Co., Richmond, Va.	Martin's Animal Bone Potato Guano.	New Bern	**5.15**	4.32	.40	4 72	5.74	9 47	33.46
	Brand claiming			**6.00**			**4.94**	**6.00**	**7.00**	**32.37**
7868	Piedmont-Mt. Airy Guano Co., Baltimore, Md.	Piedmont Special Potato Guano	New Bern	6.32	3.12	1.62	**4 74**	**5.76**	8.05	33 03
	Brands claiming			**6.00**			**5.76**	**7.00**	**5.00**	**33.35**
7928	Baugh & Sons Co., Norfolk, Va.	Baugh's 7 Per Cent Potato Guano	Elizabeth City	6.13	4.76	1.12	5.88	7.15	5.80	38 43
7865	Eastern Cotton Oil Co., Hertford, N. C.	Hertford Truck Grower	Hertford	6.92	2.40	2.88	**5.28**	6.42	5.61	**32 98**
	Brands claiming			**10.00**					**2.00**	**11.20**
7977	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Bone and Potash	New Bern	10.30					2.07	11.55
7986	Va.-Car. Chemical Co., Richmond, Va.	Travers & Co.'s Bone and Potash Compound.	Durham	10.73					1.90	11.02
	Brands claiming			**10 00**					**4.00**	**13.40**
7976	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Special Mixture	New Bern	10.47					4.85	14.76
7969	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special Potash Mixture.	Raleigh	10.69					**3.79**	13.79
	Brand claiming			**11.00**					**5.00**	**15.40**
7968	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Quickstep Bone and Potash.	Raleigh	11.78					**4.37**	15.41

	Brand claiming			**13.00**						**$ 10.40**
7957	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Double Bone Phosphate, Extra Strong.	Raleigh	13.73						10.80
	Brands claiming			**14.00**						**11.20**
8004	Baugh & Sons Co., Philadelphia, Pa.	Baugh's High Grade Acid Phosphate.	Elizabeth City	14.35						11.48
8024	Bragaw Fertilizer Co., Washington, N. C.	Palmetto Phosphate	Washington	14.15						11.32
7978	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's 14 Per Cent Soluble Bone.	New Bern	14.76						11.81
8037	Navassa Guano Co., Wilmington, N. C.	Navassa 14 Per Cent Acid Phosphate.	Wilmington	14.19						11.35
7965	Pamlico Chemical Co., Washington, N. C.	Pamlico Bone Phosphate	Washington	14.07						11.26
7871	Piedmont-Mt. Airy Guano Co., Baltimore, Md.	Piedmont High Grade S. C. Bone	Hertford	**13.98**						**11.18**
8003	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate	Elizabeth City	14.33						11.47
7922	Southern Exchange Co., Maxton, N. C.	S. E. Co.'s Acid Phosphate	Lumberton	14.42						11.54
7956	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Dissolved Bone and Potash.	Raleigh	14.87						11.90
	Brands claiming			**16.00**						**12.80**
7870	Eastern Cotton Oil Co., Hertford, N. C.	Acid Phosphate	Hertford	**15.99**						**12.79**
7841	Hubbard, M. P., & Co., Baltimore, Md.	Hubbard's 16 Per Cent Acid Phosphate.	Edenton	16.42						13.14
7992	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	16 Per Cent Acid Phosphate	Goldsboro	16.56						13.35
7959	Raisin-Monumental Co., Baltimore, Md.	Raisin's 16 Per Cent Acid Phosphate.	Raleigh	16.26						13.01
7855	Swift Fertilizer Works, Atlanta, Ga.	Swift's Special High Grade Acid Phosphate.	Maxton	16.16						12.93
7958	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 16 Per Cent Acid Phosphate.	Raleigh	16.76						13.41
	Brands claiming								**12.00**	**12.00**
7840	American Agricultural Chemical Co., New York, N. Y.	Genuine German Kainit	Edenton						13.22	13.22
8000	American Fertilizer Co., Norfolk, Va.	----do	Elizabeth City						12.68	12.68
	Brands claiming								**12.00**	**12.00**
8034	Baugh & Sons Co., Philadelphia, Pa.	Genuine German Kainit	Wilmington						12.84	12.84

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.									
	Brands claiming								12.00	$ 12.00
7973	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Genuine German Kainit	Raleigh						13.08	13.08
7952	Craven Chemical Co., New Bern, N. C.	do	New Bern						12.94	12.94
7872	Eastern Cotton Oil Co., Hertford, N. C.	do	Hertford						12 22	12.22
8015	Hadley, Harris & Co., Wilmington, N. C.	do	Wilson						13.52	13.52
7927	Martin, D. B., Co., Baltimore, Md.	do	Lumberton						13 04	13.04
8035	Navassa Guano Co., Wilmington, N. C.	do	Wilmington						12 22	12.22
8023	Pamlico Chemical Co., Washington, N. C.	do	Washington						13.22	13.22
7925	Pearsall & Co., Wilmington, N. C.	do	Lumberton						12 86	12.86
7863	Royster, F. S., Guano Co., Norfolk, Va.	do	Greenville						12.78	12.78
7923	Southern Exchange Co., Maxton, N. C.	do	Lumberton						12.06	12.06
8001	Va.-Car. Chemical Co., Richmond, Va.	do	Elizabeth City						12 50	12.50
	Brand claiming								48 00	48.00
7993	German Kali Works, Baltimore, Md.	Sulphate of Potash	Goldsboro						50 51	50.51
	Brands claiming								49 00	49.00
8038	Calder Bros., Wilmington, N. C.	Muriate of Potash	Wilmington						47.87	47.87
7854	Coe-Mortimer Co., Charleston, S. C.	do	Maxton						50.78	50.78

8036	Navassa Guano Co., Wilmington, N. C.	do	Wilmington						50 20	50.20
7924	Pearsall & Co., Wilmington, N. C.	do	Lumberton						47.68	47.68
8022	Peruvian Guano Corporation, Charleston, S. C.	do	Edenton						50.54	50.54
	Brand claiming								50 00	50.00
7972	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Muriate of Potash	Raleigh						51.05	51.05
	Brand claiming						14 85	18 05		53 48
7920	Grace, W. R., & Co., New York, N. Y.	Nitrate of Soda	Lumberton				15.12	18.38		54.44

N, D, R, S, B, P, Y and W refer to the mechanical condition of fertilizers, as follows: N—fine; D—good; R—fair; S—coarse; B—very coarse; P—damp; Y—lumpy; W—wet.

Percentage Composition or Parts per 100.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
					MIXED FERTILIZERS.						
	Brand claiming				8 00			.82	1 00	3 00	$ 14 80
7751	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Guano	Waynesville	R	8.75	.40	1.26	1 66	2.02	2.97	16.08
	Brands claiming				8.00			1 65	2 00	2 00	15 82
7796	Acme Mfg. Co., Wilmington, N. C.	Gem Fertilizer	Maiden	R	8.75	1.35	.50	1.86	2.26	1 87	16.66
7742	American Fertilizer Co., Norfolk, Va.	Bone and Peruvian Guano	Monroe	R	9.70	1.08	.62	1.70	2 07	1 76	16.67
7778	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Asheville	R	8.29	.66	1.28	1.94	2.36	2.29	17.54
7693	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Bone and Potash Compound.	Winston	S	8.16	.80	1.10	1.90	2.31	2.15	17.06
7767	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Eli Ammoniated Fertilizer	Warrenton	R	9.00	1.08	.70	1.78	2.16	2.12	17.37
7649	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Roxboro	S	8.27	.92	.82	1.74	2.11	1.99	16.42
7713	Farmers Guano Co., Raleigh, N. C.	State Standard Guano	Catawba	R	6.67	.94	.84	1.78	2.16	1.81	15.04
7810	Hampton Guano Co., Norfolk, Va.	Shirley Superphosphate	Maiden	S	8.30	1.18	.68	1.86	2.26	2.02	16.95
7761	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone	High Point	R	8.26	1.26	.60	1.86	2.26	2.23	17.14
7798	Navassa Fertilizer Co., Wilmington, N. C.	Navassa Grain Fertilizer	Maiden	R	8.42	.58	1.08	1.60	1.94	1.80	15.91
7687	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Statesville	R	8.51	.84	.84	1.68	2.04	2.22	16.65
7795	Pearsall & Co., Wilmington, N. C.	Eagle Guano	Whiteville	S	9.17	.50	1.12	1.62	1.97	2.26	17.06
7719	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Troutman	S	8.05	1.22	.58	1.80	2.19	1.88	16.44
7676	Powhatan Chemical Co., Norfolk, Va.	Magic Tobacco Grower	Mount Airy	R	8.80	.40	.64	1.04	1.26	2.70	14.95

7808	Raisin-Monumental Co., Baltimore, Md.	Raisin's Empire Guano	Conover	R	8.40	.66	.84	1.50	1.82	1.81	15.51
7664	Reidsville Fertilizer Co., Reidsville, N. C.	Banner Fertilizer	Pomona	R	7.91	.46	1.20	1.66	2.02	2.01	15.80
7634	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	N. Wilkesboro	S	9.49	.94	.40	1.34	1.83	1.82	15.77
7690	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer	Statesville	R	8.26	.38	1.22	1.80	1.94	1.98	15.85
7633	----do	Royster's Special Wheat Fertilizer.	Rockford	R	7.97	1.06	.56	1.82	1.97	1.94	15 82
7691	Swift's Fertilizer Works, Atlanta, Ga.	Swift's Red Steer Standard Grade Guano.	Winston	S	8.60	.84	.86	1.70	2.07	2.02	18.59
7821	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Standard	Statesville	R	7.85	.66	.94	1.60	1.94	2.26	15.79
	Brands claiming				8.00			1.65	2.00	2.00	15.82
7692	Union Guano Co., Norfolk, Va.	Fish Brand Ammoniated Guano	Winston	R	8.09	.90	.92	1.82	2.21	2.01	17.13
7653	----do	Old Honesty Guano	Elkin	S	10.04	1.04	.84	1.88	2.29	1.82	18.37
7779	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Asheville	R	7.92	1.10	98	2.08	2.53	1.30	16.67
7739	----do	Allison & Addison's Old Hickory Guano.	Benson	S	8.04	.54	1.10	1.64	1.99	2.56	16.45
7762	----do	Ajax Guano	Oxford	D	9.04	.96	.54	1.50	1.82	1.90	16.08
7790	----do	Davie & Whittle's Owl Brand Guano.	Charlotte	R	8.12	.88	.96	1.84	2.24	3.01	17.79
7665	----do	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano	Greensboro	R	8.32	.28	.98	1.28	1.53	2.25	14.88
7706	----do	Farmers' Favorite Fertilizer	Vineland	R	8.42	.42	1.34	1.76	2.14	2.26	16.93
7731	----do	Southern Chemical Co.'s Electric Tobacco Guano.	Kernersville	S	8.28	1.02	.60	1.62	1 97	2.06	16.14
7722	----do	Tinsley & Co.'s Stonewall Guano	Claremont	R	8.82	.88	.54	1.42	1.73	1.65	15 29
7647	----do	V.-C. C. Co.'s Plant Food	Roxboro	R	8.53	.76	1.06	1.82	2.21	2.03	17.00
7800	----do	Va. State Fertilizer Co.'s Guano	Kings Mountain	R	9.24	.86	.64	1.50	1.82	1.71	16.05
	Brands claiming				8.50			1.65	2.01	2.00	16.29
7736	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Superphosphate	Dunn	S	9.16	.78	.90	1.68	2.04	2.72	17.79
	Brand claiming				8.00			1.65	2 01	3.00	16.94
7792	Armour Fertilizer Works, Wilmington, N. C.	Armour's Carolina Cotton Special Fertilizer.	Wilmington	R	7.84	.56	1.02	1.58	1.92	2.60	16.08
	Brands claiming				8 00			2.06	2.50	3 00	18 53
7828	Acme Mfg. Co., Wilmington, N. C.	Tip Top Crop Grower	Mount Olive	D	8.10	1.44	.86	2 30	2.80	3 11	19 68

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
					Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
			MIXED FERTILIZERS.								
	Brands claiming				8.00			2.06	2 50	3 00	$ 16.53
7645	Royster, F. S., Guano Co., Norfolk, Va.	Orinoco Tobacco Guano	Durham	R	8.09	.96	1.38	2 34	2.84	2.76	19.44
7823	Va.-Car. Chemical Co., Richmond, Va.	Durham Fert. Co.'s N. C. Official Farmers' Alliance Guano.	Magnolia	R	8.09	1.08	1.10	2.18	2.65	3.03	19.11
7824	----do	Virginia State Fertilizer Co.'s Buffalo Guano.	Mount Olive	S	8.77	1.46	.88	2.34	2.84	3.25	20 59
	Brands claiming				8.00			2.47	3.00	3.00	20.13
7701	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer.	Wilmington	R	8.17	1.48	.90	2 38	2.89	2.72	19.62
7789	----do	Armour's Tobacco Special Fertilizer.	Charlotte	R	8.80	1.48	1.30	2.78	3.38	3.02	22.08
7735	Baugh & Sons Co., Norfolk, Va.	Baugh's H. G. Tobacco Guano	Lumberton	R	7.77	1.38	1.10	2.48	3.02	3.12	20.10
7797	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Horne's Best	Gastonia	R	8.52	.92	1.68	2.60	3.16	3.67	21.84
7799	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Guano	Maiden	R	8.37	1.58	1.06	2.64	3.21	3.22	21.37
7807	Patapsco Guano Co., Baltimore, Md.	Choctaw Guano	Hickory	R	8.38	1.68	2.60	2.28	2.77	3.43	20.21
7741	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters Soluble Guano	Wadesboro	R	8.54	.53	2.20	2.73	3.32	3.27	21.93
7809	Union Guano Co., Winston, N. C.	Union Guano Co.'s Union Homestead Guano.	Newton	R	8.09	1.30	1.00	2.30	2.80	2.67	19.19
7791	Va.-Car. Chemical Co., Richmond, Va.	Powers, Gibbs & Co.'s Old Kentucky High Grade Tobacco Manure.	Charlotte	R	8.59	1.52	.80	2.32	2 82	3.85	21.01
	Brands claiming				8.00			2.47	3.00	5.00	22.33
7793	Navassa Guano Co., Wilmington, N. C.	Navassa Blood and Meal Mixture.	Wilmington	R	8.90	1.02	1.14	2.16	2.63	5.23	22.19

7688	Patapsco Guano Co., Baltimore, Md.	Patapsco Plant Food for Tobacco and Truck.	Statesville	S	8.34	1.88	.84	2.72	3.31	4.80	23.39
	Brands claiming				8.00			3.29	4.00	4.00	24.47
7827	Navassa Guano Co., Wilmington, N. C.	Navassa Special Guano	Magnolia	R	7.97	1.70	1.40	3.10	3.77	5.16	24.94
7826	Pearsall & Co., Wilmington, N. C.	Pearsall's Fish and Potash Compound, High Grade.	Mount Olive	R	8.61	2.12	.74	2.86	3.48	4.78	24.16
7737	Swift's Fertilizer Works, Atlanta, Ga.	Swift's High Grade Monarch Vegetable Grower.	Chadbourn	R	8.31	.88	2.28	3.16	3.84	3.87	23.84
	Brand claiming				9.00			.82	1.00	2.00	13.50
7644	Ober, G., & Sons Co., Baltimore, Md.	Ober's Farmers' Mixture	Hillsboro	R	10.00	.62	.54	1.16	1.41	1.88	15.68
	Brands claiming				9.00			.82	1.00	3.00	14.60
7662	Patapsco Guano Co., Baltimore, Md.	Coon Brand Guano	Pilot Mountain	R	9.10	.72	.46	1.18	1.43	2.86	15.96
7749	Va.-Car. Chemical Co., Richmond, Va.	Bigelow's Crop Guano	Lincolnton	R	9.40	.48	.36	.84	1.02	2.31	14.28
7740	----do	McCormick's Wheat and Grain Guano.	Charlotte	S	9.25	.36	.58	.94	1.14	3.37	15.70
	Brand claiming				9.00			1.65	2.01	1.00	15.64
7648	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano.	Durham	R	9.28	.56	1.16	1.72	2.09	1.01	16.17
	Brand claiming				9.00			1.65	2.01	2.00	16.74
7730	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Standard Guano.	Huntersville	R	9.69	.90	.64	1.64	1.87	1.87	16.78
	Brand claiming				9.00			1.85	2.25	1.00	18.41
7822	Bradley Fertilizer Co., Boston, Mass.	Standard Sea Fowl Guano	Charlotte	R	10.65	1.44	.62	2.06	2.50	1.55	19.32
	Brand claiming				9.00			2.47	3.00	2.00	19.93
7747	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s L. & M. Special.	Lincolnton	S	9.50	1.20	1.04	2.24	2.72	1.76	18.21
	Brand claiming				9.00			2.47	3.00	4.08	22.13
7750	Va.-Car. Chemical Co., Richmond, Va.	Great Texas Cotton Grower	Lincolnton	S	9.70	1.42	1.34	2.76	3.36	2.85	22.63
	Brand claiming				9.00			2.47	3.00	8.00	24.33
7663	Reidsville Fertilizer Co., Reidsville, N. C.	Lion Brand Fertilizer	Reidsville	R	9.55	.70	2.00	2.70	3.28	5.65	25.38
	Brand claiming				9.00			2.88	3.50	9.00	29.23
7700	American Fertilizer Co., Norfolk, Va.	American Fertilizer Co.'s Strawberry and Asparagus Guano.	Burgaw	B	9.00	2.80	.22	3.02	3.67	9.22	30.11

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
					Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
					MIXED FERTILIZERS.						
	Brand claiming				9.25			2.06	2.50	2.00	$ 18.56
7718	Patapsco Guano Co., Baltimore, Md.	Patapsco Guano	Mooresville	R	9.80	1.76	.44	2.20	2.67	2.21	19.83
	Brand claiming				10.00			.62	1.00	3.00	15.50
7748	Chickamauga Fertilizer Works, Chattanooga, Tenn.	Chickamauga Corn Special	Hendersonville	R	9.61			.98	1.19	3.56	16.39
	Brand claiming				2.00			3.29	4.00	6.00	21.23
7661	Germofert Mfg. Co., Charleston, S. C.	Germofert Nature's Plant Food		D	5.75	2.00	1.32	2.32	4.04	5.10	23.73
	Brand claiming				13.00			2.06	2.50		16.52
7694	Baugh & Sons Co., Norfolk, Va.	Baugh's Pure Dissolved Animal Bone.	Winston	R	13.92			2.28	2.77		17.95
	Brands claiming				8.00					4.00	11.60
7788	American Fertilizer Co., Norfolk, Va.	American Special Potash Mixture for Wheat.	Charlotte	S	9.07					3.02	11.48
7772	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special Bone and Potash.	Asheville	R	10.14					3.16	12.60
7673	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture.	Mount Airy	R	8.11					3.35	10.96
7685	Pocahontas Guano Co., Lynchburg, Va.	Cherokee Grain Special	Mount Airy	R	8.95					3.50	11.90
7726	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Defiance Bone and Potash.	Kernersville	R	8.87					3.63	12.19
7675	Powhatan Chemical Co., Richmond, Va.	Magic Grain and Grass Grower	Mount Airy	R	9.49					3.26	12.13
7680	Richmond Guano Co., Richmond, Va.	Winter Grain and Grass Grower	Mount Airy	S	9.29					2.78	11.42

7695	Swift Fertilizer Works, Atlanta, Ga.	Swift's Plantation Standard Grade Phosphate and Potash.	Winston	R	7.78					4.22	11.64
7640	Union Guano Co., Winston, N. C.	Union Wheat Mixture	N. Wilkesboro	R	8.95					3.38	11.77
7655	Va.-Car. Chemical Co., Richmond, Va.	Click's Special for Wheat	Elkin	R	8.80					3.17	11.40
7666	----do	----do	Walnut Cove	R	8.79					3.95	12.25
7656	----do	Durham Fertilizer Co.'s Carr's Special Wheat Grower.	Walnut Cove	S	9.75					3.50	12.62
7776	----do	----do	Asheville	R	8.50					3.27	11.25
7641	----do	Old Dominion Guano Co.'s Miller's Sp'l Wheat Mixture.	Elkin	R	8.36					3.88	11.79
7745	----do	Travers & Co.'s Special Wheat Compound.	Biltmore	R	8.88					3.20	11.51
	Brand claiming				9.00					4.00	12.50
7773	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Bone and Potash Fertilizer.	Morganton	R	9.17					3.85	12.49
	Brand claiming				10.50					1.50	11.02
7765	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Great Wheat and Corn Grower.	Oxford	D	10.53					1.40	11.02
	Brands claiming				10.00					2.00	11.20
7734	Acme Mfg. Co., Wilmington, N. C.	Acme Bone and Potash	Maxton	R	10.77					3.63	13.69
7712	American Fertilizer Co., Norfolk, Va.	Dissolved Bone and Potash for Wheat and Corn.	Catawba	R	10.57					1.74	11.43
7771	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Buncombe Wheat Grower.	Asheville	R	10.04					1.55	10.74
7812	Hampton Guano Co., Norfolk, Va.	Dauntless Potash Mixture	Malden	R	10.30					1.98	11.43
7774	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Wheat Fertilizer	Morganton	R	9.14					2.45	10.92
7794	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.	Maiden	R	10.67					1.60	11.36
7817	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters Bone and Potash	Statesville	R	10.92					2.03	12.06
7679	Pocahontas Guano Co., Richmond, Va.	Carrington's Superior Grain Compound.	Mount Airy	R	10.31					2.00	11.48
7632	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture	Ronda	R	10.01					2.02	11.23
7667	Reidsville Fertilizer Co., Reidsville, N. C.	Bone and Potash	Pomona	R	10.50					3.55	13.35
7638	Richmond Guano Co., Richmond, Va.	Bone and Potash Mixture	N. Wilkesboro	R	10.23					1.82	11.21
7696	Swift Fertilizer Works, Atlanta, Ga.	Swift's Field and Farm Standard Grade Phos. and Potash.	Winston	R	9.48					2.45	11.23
7818	----do	Swift's Standard Grade Wheat Grower.	Fayetteville	D	10.79					1.58	11.43

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.								
	Brand claiming				**10.00**					**2.00**	**$ 11.20**
7727	Union Guano Co., Winston, N. C.	Union 10-2 Bone and Potash	Lexington	R	9.23					2.32	10 86
7652	----do	Union Bone and Potash	Elkin	S	9.93					1.58	10.87
7683	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's McGavock's Special Potash Mixture.	Mount Airy	R	9.69					1.55	10.42
7721	----do	----do	Catawba	R	10.10					1.69	10.95
7755	----do	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Salisbury	R	11.39					1.50	11.90
7651	----do	Durham Fertilizer Co.'s Durham Bone and Potash Mixture.	Durham	R	10 93					1.82	11.84
7744	----do	Durham Fertilizer Co.'s Standard Wheat Grower.	Biltmore	R	11.15					1.33	11.50
7657	----do	Old Dominion Alkaline Bone and Potash.	Crutchfield	S	10.59					1.68	11.38
7658	----do	Southern Chem. Co.'s Mammoth Wheat and Grass Grower.	Crutchfield	R	10.06					1.69	10.91
7654	----do	Travers & Co.'s Bone and Potash Compound.	Elkin	S	11.92					1.35	12.21
7725	----do	Travers & Co.'s Capital Bone and Potash Compound.	Rutherfordton	R	8.65					3.17	12.17
	Brand claiming				**10.00**					**2.00**	**11.20**
7793	Va.-Car. Chemical Co., Richmond, Va.	Va. State Fertilizer Co.'s Dissolved Bone and Potash.	Kings Mountain	R	11.65					1.68	11.77
	Brands claiming				**10.00**					**4.00**	**13.40**
7795	Caralelgh Phosphate and Fertiiizer Works, Raielgh, N. C.	Special Bone and Potash Mixture.	Gastonia	R	12.27					3.33	14.70

7723	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture.	Waynesville	R	10.90					5.03	15.34
7760	Miller Fertilizer Co., Baltimore, Md.	Miller Fertilizer Co.'s 10-4 Mixture.	High Point	R	10.42					4.11	13.90
7678	Pocahontas Guano Co., Lynchburg, Va.	Wabash Wheat Mixture	Mount Airy	R	10.14					4.09	13.53
7635	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Bone and Potash Mixture.	Ronda	S	10.56					4.04	13 95
7681	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture	Mount Airy	R	10.48					3.68	13.48
7636	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture.	Rockford	R	10.00					3.98	13.38
7639	Union Guano Co., Winston, N. C.	Quaker Grain Mixture	N. Wilkesboro	R	10.45					3.70	13.47
7668	Va.-Car. Chemical Co., Richmond, Va.	Special Potash Mixture	Greensboro	R	10.06					4.01	13.46
7792	----do	Va. State Fertilizer Co.'s XX Potash Mixture.	Kings Mountain	R	10.35					3.73	13.42
	Brand claiming				10.00					6.00	15 60
7746	Asheville Packing Co., Asheville, N. C.	High Grade Special Potash Mixture.	Hendersonville	R	10.98					4.95	15.32
	Brand claiming				11.00					5.00	15 40
7775	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Quickstep Bone and Potash.	Asheville	R	12.02					3.66	14.67
	Brand claiming				12.00					4.00	15.20
7811	Union Guano Co., Winston, N. C.	Union Guano Co.'s Bone and Potash.	Hickory	R	8.95					3.68	11 99

RAW OR UNMIXED FERTILIZER MATERIALS.

	Brands claiming				12.00						9.60
7715	Navassa Guano Co., Wilmington, N. C.	Navassa Acid Phosphate	Catawba	R	12.09						9.67
7729	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Durham Acid Phosphate.	Mocksville	R	12.57						10.06
7756	----do	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Salisbury	R	15.25						12 20
7732	----do	Southern Chemical Co.'s Tar Heel Acid Phosphate.	High Point	R	12.75						10.20
	Brands claiming				13.00						10 40
7785	Acme Manufacturing Co., Wilmington, N. C.	Acme Acid Phosphate	Charlotte	R	13.30						10.64
7671	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Sterling Acid Phosphate.	Walnut Cove	R	14.15						11.32
7650	Columbia Guano Co., Norfolk, Va.	Columbia Dissolved Bone	Hillsboro	S	13.32						10 66

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.										
	Brands claiming				13.00						$ 10.40
7699	Etiwan Fertilizer Co., Charleston, S. C.	Diamond Soluble Bone	Winston	R	14.58						11.66
7714	Farmers Guano Co., Raleigh, N. C.	Farmers Acid Phosphate	Catawba	R	13.22						10.58
7711	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone	Wilmington	R	14.65						11.72
7698	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Winston	S	14.16						11.33
7697	Union Guano Co., Winston, N. C.	Union Dissolved Bone	Winston	R	13.26						10.61
7769	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s I X L Acid Phosphate	Marion	R	13.29						10.63
7724	....do	Davie & Whittle's Owl Brand Acid Phosphate.	Rutherfordton	R	13.34						10.67
7659	....do	Durham Fertilizer Co.'s Double Bone Phosphate.	Crutchfield	R	12.84						10.27
7754	....do	Durham Fertilizer Co.'s Double Bone Phosphate Extra Strong	Salisbury	R	14.49						11.59
7660	....do	Old Dominion Guano Co.'s Acid Phosphate.	Crutchfield	S	13.04						10.43
	Brands claiming				14.00						11.20
7782	American Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate	Charlotte	R	14.39						11.51
7770	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Standard Phosphoric Acid.	Asheville	S	15.34						12.27
7766	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Climax Dissolved Bone	Warrenton	R	13.41						10.73
7803	Hampton Guano Co., Norfolk, Va.	Hampton's Acid Phosphate	Maiden	R	14.90						11.92

7801	Navassa Guano Co., Wilmington, N. C.	Navassa 14 Per Cent Acid Phosphate.	Maiden	R	**13.93**							**11.14**
7642	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate	Ronda	R	**14.60**							**11.68**
7684	Powhatan Chemical Co., Richmond, Va.	High Grade Acid Phosphate	Mount Airy	R	**13.44**							**10.75**
7643	Royster, F. S., Guano Co., Norfolk, Va.	14 Per Cent Acid Phosphate	Rockford	R	**14.58**							**11.66**
7804	Swift Fertilizer Works, Atlanta, Ga.	Swift's Cultivator High Grade Acid Phosphate.	Maiden	R	**13.63**							**10.90**
7819	Union Guano Co., Winston, N. C.	Union Guano Co.'s High Grade Acid Phosphate.	Statesville	R	**14.16**							**11.33**
7672	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Fulton Acid Phosphate.	Greensboro	R	**14.97**							**11.98**
7768	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand High Grade Dissolved Bone.	Biltmore	D	**14.10**							**11.28**
7816	----do----	Durham Fertilizer Co.'s Standard Grade Acid Phosphate.	Hickory	R	**15.27**							**12.22**
7763	----do----	Va.-Car. Chemical Co.'s 14 Per Cent Acid Phosphate.	Henderson	D	**14.40**							**11.52**
7758	----do----	Southern Chemical Co.'s Red Cross Acid Phosphate.	Salisbury	R	**15.17**							**12.14**
7707	----do----	J. G. Tinsley & Co.'s Powhatan Acid Phosphate.	Rose Hill	R	**14.54**							**11.63**
7753	----do----	S. W. Travers & Co.'s Dissolved Bone Phosphate.	Hendersonville	R	**14.74**							**11.79**
	Brands claiming				**16.00**							**12.80**
7783	American Fertilizer Co., Norfolk, Va.	American High Grade Acid Phosphate.	Charlotte	R	**16.04**							**12.83**
7708	Armour Fertilizer Works, Wilmington, N. C.	16 Per Cent Acid Phosphate	Wilmington	R	**16.35**							**13.08**
7784	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	16 Per Cent Caraleigh Acid Phosphate.	Gastonia	D	**16.22**							**12.98**
7716	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate.	Claremont	D	**17.45**							**13.96**
7815	Patapsco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Hickory	R	**17.10**							**13.68**
7805	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate	Maiden	R	**17.95**							**14.36**
7752	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone Phosphate	Shelby	R	**15.56**							**12.45**
7814	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 16 Per Cent Acid Phosphate.	Conover	S	**16.30**							**13.04**
7630	Swift Fertilizer Works, Atlanta, Ga.	High Grade Swift's Special Acid Phosphate.	Winston	R	**16.34**							**13.07**
7813	Union Guano Co., Winston, N. C.	Union 16 Per Cent Acid Phosphate.	Newton	D	**15.30**							**12 24**
7781	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand High Grade Acid Phosphate.	Charlotte	D	**15.41**							**12 33**

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-Soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.										
	Brands claiming				16.00						$ 12.80
7780	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Acid Phosphate.	Gastonia	R	16.24						12.99
7743	----do	Va.-Car. Chemical Co.'s 16 Per Cent Acid Phosphate.	Monroe	R	16.31						13.05
7682	----do	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.	Mount Airy	R	16.40						13.12
7757	----do	----do	Salisbury	R	16.35						13.08
7802	----do	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.	Kings Mountain	R	16.69						13.35
	Brands claiming									12.00	12.00
7799	Calder Bros., Wilmington, N. C.	Genuine German Kainit	Vineland	R						12.50	12 50
7786	Farmers Cotton Oil Co., Wilson, N. C.	----do	Gastonia	P						12.10	12.10
7738	Swift Fertilizer Works, Atlanta, Ga.	Pure German Kainit	Chadbourn	S						12.24	12.24
7764	Va.-Car. Chemical Co., Richmond, Va.	Genuine German Kainit	Oxford	R						11.96	11.96
	Brand claiming									50.00	50 00
7820	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Muriate of Potash	Statesville	P						47 54	47.54
	Brands claiming							14.83	18.00		53.38
7710	Coe-Mortimer Co., Charleston, S. C.	Nitrate of Soda	Wilmington	B				14.96	18.19		53.86
7829	Va.-Car. Chemical Co., Richmond, Va.	----do	Mount Olive	P				15.20	18.48		54.72

	Brands claiming								2.47	3.00		24.29
7674	Martin, D. B., Co., Baltimore, Md.	Martin's Pure Ground Bone	Winston	R					3.00	3.65		a24.54
7759	Miller Fertilizer Co., Baltimore, Md.	Ground Bone	High Point	R					2.70	3.28		b24.35
	Brands claiming								3.70	4.50		29.11
7670	Baugh & Sons Co., Norfolk, Va.	Baugh's Raw Bone Meal	Madison	D					3.96	4.81		c27.38
7677	Pocahontas Guano Co., Richmond, Va.	Raw Bone Meal	Mount Airy	S					3.68	4.45		d26.53
7720	Royster, F. S., Guano Co., Norfolk, Va.	Pure Raw Bone Meal	Salisbury	S					3.96	4.81		e27.85
7646	Union Guano Co., Winston, N. C.	Pure Bone Meal	Reidsville	B					4.24	5.15		f29.93
7669	Va.-Car. Chemical Co., Richmond, Va.	Pure Raw Bone	Greensboro	R					4.12	5.01		g29.67
	Brand claiming								2.68	3.50	3.25	
7631	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	N. Wilkesboro	R					1.69	2.30	2.72	h23.03
	Brand claiming								4.13	5.02	2.00	
7689	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	Winston	R					3.80	4.62	1.65	124.29
	Brand claiming								1.65	2.00	2.50	20.39
7686	Martin, D. B., Co., Baltimore, Md.	Pure Animal Bone and Potash	Winston	D					1.98	2.41	2.27	j23.92

N, D, R, S, B, P, Y and W refer to the mechanical condition of fertilizers, as follows: N—fine; D—good; R—fair; S—coarse; B—very coarse; P—damp; Y—lumpy; W—wet.

(a) Total Phosphoric Acid found, 19.63, valued at 3½ cents per pound.
(b) Total Phosphoric Acid found, 20.90, valued at 3½ cents per pound.
(c) Total Phosphoric Acid found, 18.75, valued at 3½ cents per pound.
(d) Total Phosphoric Acid found, 19.08, valued at 3½ cents per pound.
(e) Total Phosphoric Acid found, 19.43, valued at 3½ cents per pound.
(f) Total Phosphoric Acid found, 20.95, valued at 3½ cents per pound.
(g) Total Phosphoric Acid found, 21.20, valued at 3½ cents per pound.
(h) Total Phosphoric Acid found, 18.10, valued at 3½ cents per pound.
(i) Total Phosphoric Acid found, 10.63, valued at 3½ cents per pound.
(j) Total Phosphoric Acid found, 19.58, valued at 3½ cents per pound.

II. FERTILIZER BRANDS REGISTERED FOR 1910.

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Atlantic Chemical Corporation, Norfolk, Va.—			
Atlantic High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Atlantic 14 Per Cent Acid Phosphate	14.00	....	....
Atlantic Dissolved Bone	13.00	....	....
Atlantic Acid Phosphate	12.00	....	....
Atlantic 10 and 5 Bone and Potash Mixture	10.00	....	5.00
Atlantic 10 and 4 Bone and Potash Mixture	10.00	....	4.00
Atlantic Bone and Potash for Grain	10.00	....	3.00
Atlantic Bone and Potash Mixture	10.00	....	2.00
Atlantic Meal Compound	9.00	2.27	2.00
Atlantic Cotton Grower	9.00	2.06	1.00
Atlantic Special Guano	9.00	1.65	1.00
Atlantic Special Truck Guano	8.00	3.30	4.00
Atlantic High Grade Tobacco Guano	8.00	2.47	3.00
Atlantic High Grade Cotton Guano	8.00	2.47	3.00
Atlantic Tobacco Grower	8.00	2.06	3.00
Atlantic Tobacco Compound	8.00	2.06	2.00
Atlantic Special Wheat Fertilizer	8.00	1.65	2.00
Atlantic Soluble Guano	8.00	1.65	2.00
Atlantic 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Atlantic 7 Per Cent Truck Guano	7.00	5.77	7.00
Atlantic Potato Guano	7.00	4.12	5.00
Pure Raw Bone Meal.....Total	21.50	3.71	....
Corona Cotton Compound	9.00	1.65	3.00
Oriental High Grade Guano	8.00	3.30	4.00
Paloma Tobacco Guano	8.00	3.30	4.00
Boon's Special Guano	8.00	2.47	4.00
Apex Peanut Grower	8.00	1.02	4.00
Perfection Peanut Grower	7.00	....	5.00
Nitrate of Soda	....	15.22	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Geo. L. Arps & Co., Norfolk, Va.—			
Arps' H. G. 16 Per Cent Acid Phosphate	16.00	....	....
Arps' "Go-a-Head" Guano for Trucks, Cotton and Tobacco	8.00	3.30	4.00
Arps' Tobacco Guano	8.00	2.47	3.00
Arps' Quick Growth for All Crops	8.00	2.47	3.00
Arps' Premium Guano for Cotton, Tobacco and All Spring Crops	8.00	1.65	2.00
Arps' Standard Truck Guano	7.00	4.12	5.00
Arps' Potato Guano	6.00	5.76	5.00
Arps' Scuppernong Guano for Trucks	6.00	4.12	7.00
14 Per Cent Acid Phosphate	14.00	....	....
Geo. L. Arps & Co.'s Big Yield Guano	8.00	1.65	2.00
Genuine German Kainit	....	....	12.00
Acme Manufacturing Co., Wilmington, N. C.—			
Acme Acid Phosphate	16.00	....	....
Acme High Grade Acid Phosphate	14.00	....	....
Acme 13 Per Cent Acid Phosphate	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Acme Bone and Potash	11.00	....	2.00
Acme Melon Grower	10.00	3.30	5.00
Acme Bone and Potash	10.00	....	4.00
Acme Bone and Potash	10.00	....	2.00
Acme Cotton Grower	9.00	2.27	2.00
Acme Plumb Good Fertilizer	8.00	3.30	6.00
Acme Special Fertilizer for Cotton	8.00	4.12	7.00
Acme Crop Grower	8.00	2.47	4.00
Acme Plant Food	8.00	2.47	2.50
Acme Fertilizer for Tobacco	8.00	2.47	2.50
Acme Fertilizer	8.00	2.47	2.50
Acme Special Grain Fertilizer	8.00	1.65	2.00
Acme Root Crop Guano	7.00	4.12	7.00
Acme Standard Truck Guano	7.00	4.12	5.00
Acme High Grade Guano	6.00	4.95	8.00
Acme Truck Guano	6.00	3.30	8.00
Acme Corn Guano	6.00	2.47	3.00
Acme Top Dresser	....	7.42	3.00
Gibson's Melon Grower	10.00	3.30	5.00
Quickstep Fertilizer	8.00	3.30	4.00
Quickstep Fertilizer for Tobacco	8.00	3.29	4.00
Currie's High Grade Fertilizer	8.00	2.47	4.00
Best's Fish Scrap Guano, 8-3-3	8.00	2.47	3.00
Pee Dee Special Fertilizer	8.00	2.47	3.00
Pee Dee Special for Tobacco	8.00	2.47	3.00
Tiptop Crop Grower	8.00	2.06	3.00
Tiptop Tobacco Grower	8.00	2.06	3.00
Lattimer's Complete Fertilizer	8.00	2.06	2.00
Best's Complete Fertilizer, 8-2½-2	8.00	2.06	2.00
Gem Fertilizer	8.00	1.65	2.00
Gem Fertilizer for Tobacco	8.00	1.65	2.00
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.85	....
12 Per Cent Tankage	....	9.85	....
Muriate of Potash	....	....	48.00
High Grade German Kainit	....	....	16.00
Pure German Kainit	....	....	12.00
Ashepoo Fertilizer Co., Charleston, S. C.—			
High Grade Ashepoo Dissolved Phosphate	16.00	....	....
High Grade Ashepoo Acid Phosphate	14.00	....	....
High Grade Ashepoo XXXX Acid Phosphate	14.00	....	....
H. G. Ashepoo Bone and Potash	12.00	....	2.00
H. G. Ashepoo Cantaloupe Guano	10.00	2.46	10.00
High Grade Ashepoo Watermelon Guano	10.00	3.29	5.00
High Grade Ashepoo Superpotash Acid Phosphate	10.00	....	4.00
High Grade Ashepoo Fruit Grower	8.00	3.91	2.75
High Grade Ashepoo Perfection Guano	8.00	3.29	6.00
High Grade Ashepoo Guano	8.00	3.29	4.00
High Grade Ashepoo Special Cotton-seed Meal Guano	8.00	2.46	4.00
High Grade Ashepoo Bird and Fish Guano	8.00	2.46	3.00
High Grade Ashepoo Meal Mixture	8.00	2.46	3.00
High Grade Ashepoo X Tobacco Fertilizer	8.00	2.46	3.00
High Grade Ashepoo Golden Tobacco Producer	8.00	2.46	3.00
High Grade Ashepoo Ammoniated Superphosphate	8.00	2.46	2.00
High Grade Ashepoo Farmers' Special	8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
High Grade Ashepoo Truck Guano	7.00	4.12	5.00
High Grade Ashepoo Vegetable Guano	5.00	4.12	5.00
High Grade Ashepoo Nitrogenous Top Dressing	3.00	7.00	2.00
High Grade Eutaw Acid Phosphate	14.00	....	....
H. G. Eutaw Superpotash Acid Phosphate	10.00	....	4.00
High Grade Eutaw X Golden Fertilizer	8.00	2.46	4.00
High Grade Eutaw Special Cotton-seed Meal Guano	8.00	2.46	4.00
High Grade Taylor's Circle Guano	9.00	1.65	4.00
High Grade Carolina XXX Guano	8.00	2.46	3.00
Standard Ashepoo XXX Acid Phosphate	13.00	....	....
Standard Ashepoo Acid Phosphate and Potash.	12.00	....	1.00
Standard Ashepoo Dissolved Bone	12.00	....	....
Standard Ashepoo XX Acid Phosphate	12.00	....	....
Standard Ashepoo Potash and Acid Phosphate.	11.00	....	1.00
Standard Ashepoo Potash Compound	10.00	....	3.00
Standard Ashepoo Wheat and Oats Specific	9.50	1.65	1.00
Standard Ashepoo Fertilizer	9.00	1.85	1.00
Standard Ashepoo Harrow Brand Raw Bone Superphosphate	9.00	1.65	2.00
Standard Ashepoo Guano	8.50	2.06	1.00
Standard Ashepoo XX Guano	8.50	1.65	2.00
Standard Ashepoo Circle Guano	8.00	2.06	2.00
Standard Ashepoo XXX Guano	8.00	1.65	2.00
Standard Ashepoo Special Fertilizer	8.00	1.65	2.00
Standard Eutaw XXX Acid Phosphate	13.00	....	....
Standard Eutaw Acid Phosphate and Potash	12.00	....	1.00
Standard Eutaw XX Acid Phosphate	12.00	....	....
Standard Eutaw Potash Acid Phosphate	11.00	....	1.00
Standard Eutaw Fertilizer	9.00	1.85	1.00
Standard Eutaw XXX Guano	9.00	1.65	2.00
Standard Eutaw XX Guano	8.50	1.65	2.00
Standard Eutaw Circle Guano	8.00	2.06	2.00
Standard Carolina Acid Phosphate	13.00	....	....
Standard Circle Bone	13.00	....	....
Standard Coomassie Acid Phosphate	12.00	....	....
Standard Palmetto Potash Acid Phosphate	11.00	....	1.00
Standard Enoree Acid Phosphate and Potash.	10.00	....	2.00
Standard Coomassie Circle Fertilizer	8.00	1.65	2.00
Standard Carolina Guano	8.00	1.65	2.00
Standard P. D. Fertilizer	8.00	1.65	2.00
Standard Bronwood Acid Phosphate	8.00	....	4.00
Taylor's XX Ammoniated Dissolved Fertilizer.	10.00	.82	1.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	45.00
Nitrate of Potash	....	....	18.00
German Kainit	....	....	12.00
The Armour Fertilizer Works, Atlanta, Chicago and Wilmington—			
Armour's Raw Bone Meal.....Total	22.00	3.70	....
Armour's Slaughter House Fertilizer	8.00	1.65	2.00
Armour's Special Top Dresser	....	7.82	4.00
17 Per Cent Acid Phosphate	17.00	....	....
16 Per Cent Acid Phosphate	16.00	....	....
Star Phosphate	14.00	....	....
13 Per Cent Acid Phosphate	13.00	....	....
12 Per Cent Acid Phosphate	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Phosphoric Acid and Potash	10.00	....	5.00
Superphosphate and Potash	10.00	....	4.00
M. H. White & Co.'s Special Corn Mixture	10.00	....	2.00
Phosphate and Potash No. 1	10.00	....	2.00
Ammoniated Dissolved Bone and Potash	10.00	1.65	2.00
African Cotton Grower	9.00	2.47	3.00
Bone and Dissolved Bone with Potash	9.00	1.65	3.00
Bone, Blood and Potash	8.00	4.11	7.00
Van Lindley's Special	8.00	4.11	2.00
Fertilizer No. 846	8.00	3.30	6.00
Special Trucker	8.00	3.30	4.00
All Soluble	8.00	2.88	4.00
Truck and Berry Special	8.00	2.47	10.00
Fertilizer No. 836	8.00	2.47	6.00
Cotton Special	8.00	2.47	3.00
Tobacco Special	8.00	2.47	3.00
Carolina Cotton Grower	8.00	2.47	2.00
Berry King	8.00	2.06	4.00
Gold Medal for Tobacco	8.00	2.06	3.00
Sweet Potato Special	8.00	2.06	3.00
Champion	8.00	2.06	2.50
King Cotton	8.00	2.06	2.00
High Grade Potato	8.00	1.65	10.00
Fruit and Root Crop Special	8.00	1.65	5.00
Carolina Cotton Special	8.00	1.65	3.00
Standard Cotton Grower	8.50	1.65	2.00
General	8.00	1.65	2.00
Phosphate and Potash No. 2	8.00	....	5.00
Phosphate and Potash No. 3	8.00	....	4.00
7 Per Cent Trucker	6.00	5.76	5.00
5 Per Cent Trucker	6.00	4.12	7.00
Manure Substitute	6.00	3.30	4.00
Manure Substitute	6.00	3.30	4.00
10 Per Cent Trucker	5.00	8.24	3.00
Top Dresser	5.00	8.24	2.00
Special Formula for Tobacco	4.00	3.30	5.00
Harvey's Special	4.00	3.30	4.00
10 Per Cent Tankage	2.00	8.24	....
Nitrate of Soda	....	14.81	....
Dried Blood	....	13.16	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
American Fertilizing Co., Norfolk, Va.—			
American High Grade Acid Phosphate	16.00	....	....
American Standard Cotton Grower	10.00	1.65	2.00
American Formula for Wheat and Corn	10.00	....	5.00
American Bone Mixture	9.00	.83	2.00
American Nonpareil Tobacco Grower	8.00	3.29	4.00
American Eagle Guano	8.00	2.47	3.00
American No. 1 Fertilizer	8.00	2.06	3.00
American No. 2 Fertilizer	8.00	1.65	2.00
American Special Potash Mixture for Wheat	8.00	....	4.00
American 7-7-7 for Irish Potatoes	7.00	5.76	7.00
American Fish Scrap Guano	7.00	3.29	4.00
Bone Meal .....Total	22.50	3.71	....
Bone and Peruvian Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
High Grade Acid Phosphate	14.00	....	....
Eagle Brand Acid Phosphate	13.00	....	....
Acid Phosphate	12.00	....	....
Double Extra Bone and Potash	12.00	....	5.00
Double Dissolved Bone and Potash	10.00	....	4.00
Dissolved Bone and Potash for Corn and Wheat	10.00	....	2.00
Strawberry and Asparagus Guano	9.00	2.88	9.00
Pitt County Special Fertilizer	9.00	2.88	5.00
Special Formula Guano for Yellow Leaf Tobacco	9.00	2.88	5.00
Blood and Bone Compound	8.50	2.06	1.00
Peruvian Mixture	8.50	1.65	1.50
Peruvian Mixture Guano Especially Prepared for Sweet Potatoes	8.00	3.29	5.00
N. C. and S. C. Cotton Grower	8.00	3.29	4.00
J. G. Miller & Co.'s Yellow Leaf Fertilizer	8.00	2.47	3.00
Bob White Fertilizer for Tobacco	8.00	2.06	1.50
A. L. Hanna's Special	8.00	1.65	2.00
Cooper's Genuine Eagle Island	8.00	1.65	2.00
10 Per Cent Ammoniated Guano	7.00	8.24	2.50
Standard 7 Per Cent Ammonia Guano	7.00	5.76	5.00
Special Potato Guano	7.00	4.12	7.00
Special Potato Guano	6.00	4.12	7.00
Kale, Spinach and Cabbage Guano	7.00	4.12	4.00
Stable Manure Substitute	7.00	2.47	4.00
Nitrate of Soda	....	14.83	....
Ground Fish Scraps	....	8.24	....
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Atlantic Fertilizer Co., Baltimore, Md.—			
Farmers' Alkaline Bone	10.00	....	2.00
American Agricultural Chemical Co., New York—			
A. A. C. Co.'s Fine Ground Bone.....Total	22.88	2.47	....
A. A. C. Co.'s Superphosphate	16.00	....	....
A. A. C. Co.'s New Rival Crop Producer	10.00	.82	1.00
A. A. C. Co.'s Fidelity Crop Grower	8.00	.82	3.00
A. A. C. Co.'s Palmetto Alkaline Phosphate	8.00	....	4.00
A. A. C. Co.'s Bull Head Potato and Vegetable Manure	6.00	4.11	7.00
A. A. C. Co.'s Nitrate of Soda	....	15.00	....
A. A. C. Co.'s Muriate of Potash	....	....	49.00
A. A. C. Co.'s Sulphate of Potash	....	....	48.00
A. A. C. Co.'s Genuine German Kainit	....	....	12.00
Baker's Tobacco Fertilizer	8.00	2.47	3.00
Canton Chemical Gem Phosphate	12.00	....	....
Canton Chemical Animal Bone Fertilizer	9.00	1.85	4.00
Canton Chemical Baker's Tobacco Fertilizer	8.00	2.47	3.00
Canton Chemical Superior High Grade Fertilizer	8.00	2.47	3.00
Canton Chemical CCC Special Compound	8.00	2.06	6.00
Canton Chemical Baker's Standard High Grade Guano	8.00	2.06	3.00
Canton Chemical Virginia Standard Manure	8.00	2.06	2.00
Canton Chemical Baker's Fish Guano	8.00	1.65	2.00
Canton Chemical Game Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Canton Chemical Excelsior Trucker	7.00	4.11	5.00
Canton Chemical Truckers' Special 7 Per Cent.	6.00	5.76	5.00
Detrick's XXtra Acid Phosphate	14.00	....	....
Detrick's P. & B. Special Fertilizer	12.00	....	3.00
Detrick's Superior Animal Bone Fertilizer	9.00	1.85	4.00
Detrick's Special Tobacco Fertilizer	8.00	2.47	3.00
Detrick's Vegetator Ammoniated Superphosphate	8.00	2.06	3.00
Detrick's Kangaroo Komplete Kompound	8.00	1.65	3.00
Detrick's Royal Crop Grower	8.00	1.65	2.00
Detrick's Fish Mixture	8.00	1.65	2.00
Detrick's Special Trucker	7.00	4.11	5.00
Detrick's Gold Basis	6.00	5.76	5.00
Detrick's Gold Eagle	6.00	2.47	6.00
Lazaretto Acid Phosphate	14.00	....	....
Lazaretto High Grade Dissolved Phosphate and Potash	12.00	....	5.00
Lazaretto Retriever Animal Bone Fertilizer	9.00	1.85	4.00
Lazaretto Peanut Grower	9.00	.82	3.00
Lazaretto Challenge Fertilizer	8.00	2.47	3.00
Lazaretto Special Tobacco and Potato Fertilizer	8.00	2.47	3.00
Lazaretto Climax Plant Food	8.00	2.06	3.00
Lazaretto Universal Compound	8.00	2.06	2.00
Lazaretto Crop Grower	8.00	1.65	2.00
Lazaretto Early Trucker	7.00	4.11	5.00
Lazaretto Truckers' Favorite	6.00	5.76	5.00
Pure Ground Bone.....Total	20.59	3.70	....
Reese Pacific Guano for Tobacco	8.50	2.47	2.50
Reese Pacific Guano	8.00	1.65	2.00
Slingluff's British Mixture	8.00	2.06	2.50
Zell's Dissolved Phosphate	14.00	....	....
Zell's High Grade Potash Fertilizer	10.00	....	4.00
Zell's Electric Phosphate	10.00	....	2.00
Zell's Royal High Grade Fertilizer	9.00	2.06	2.00
Zell's Victoria Animal Bone Compound	9.00	1.85	4.00
Zell's Special Compound for Potatoes and Vegetables	8.00	2.47	4.00
Zell's Tobacco Fertilizer	8.00	2.47	4.00
Zell's Bright Tobacco Grower	8.00	2.47	3.00
Zell's Reliance High Grade Manure	8.00	2.47	3.00
Zell's Special Compound for Tobacco	8.00	1.65	2.00
Zell's Calvert Guano	8.00	1.65	2.00
Zell's Ammoniated Superphosphate	8.00	1.65	2.00
Zell's Fish Guano	8.00	1.65	2.00
Zell's Truck Grower	7.00	4.11	5.00
Zell's 7 Per Cent Potato and Vegetable Manure,	6.00	5.76	5.00
Zell's 10 Per Cent Trucker	5.00	8.23	3.00
The American Agricultural Chemical Co., Baltimore, Md.—			
Canton Chemical Baker's Dissolved S. C. Phosphate	14.00	....	....
Canton Chemical Soluble Alkaline Phosphate,	12.00	....	3.00
Canton's Chemical Soluble Phosphate and Potash	10.00	....	2.00
Detrick's Victory Alkaline Bone	12.00	....	5.00
Detrick's Soluble Phosphate and Potash	10.00	....	2.00
Detrick's Quickstep Phosphate for Potatoes and Tobacco	8.00	2.47	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Lazaretto Alkaline Bone Phosphate	12.00	....	3.00
Lazaretto Dissolved Phosphate and Potash	10.00	....	2.00
Lazaretto Manure Substitute	8.00	3.29	4.00
The American Agricultural Chemical Co. Royal Alkaline Bone	10.00	....	4.00
The American Agricultural Chemical Co. Enterprise Alkaline Bone	8.00	....	5.00
The American Agricultural Chemical Co. Empire Trucker	7.00	3.29	4.00
Dry Ground Fish	6.00	8.23	....
Special H. G. Dried Blood	....	13.16	....
A. D. Adair & McCarty Bros., Atlanta, Ga.—			
Adair's High Grade Dissolved Bone, No. 16	16.00	....	....
Adair's High Grade Dissolved Bone	14.00	....	....
Adair's Dissolved Bone	12.00	....	....
Adair's H. G. Blood and Bone	10.00	2.47	3.00
Adair's Soluble Pacific Guano	10.00	1.65	2.00
Adair's Wheat and Grass Grower, No. 8	10.00	....	8.00
Adair's Wheat and Grass Grower, No. 6	10.00	....	6.00
Adair's Wheat and Grass Grower, No. 5	10.00	....	5.00
Adair's Wheat and Grass Grower	10.00	....	4.00
Adair's Blood, Bone and Tankage Guano	9.00	.82	2.00
Adair's Ammoniated Dissolved Bone	8.00	1.65	2.00
Adair's Special Potash Mixture, No. 6	8.00	....	6.00
Adair's Special Potash Mixture, No. 5	8.00	....	5.00
Adair's Special Potash Mixture	8.00	....	4.00
A. & M. 13-4	13.00	....	4.00
David Harum Extra High Grade Guano	10.00	3.30	4.00
H. G. Potash Compound, No. 8	10.00	....	8.00
H. G. Potash Compound, No. 6	10.00	....	6.00
H. G. Potash Compound, No. 5	10.00	....	5.00
High Grade Potash Compound	10.00	....	4.00
McCarty's Potash Formula, No. 5	12.00	....	5.00
McCarty's Potash Formula, No. 4	12.00	....	4.00
McCarty's Potash Formula	12.00	....	2.00
McCarty's High Grade Corn Grower	10.00	1.65	2.00
McCarty's High Grade Cotton Grower	10.00	1.65	2.00
McCarty's Wheat Special	10.00	.82	3.00
McCarty's Corn Special	10.00	.82	3.00
Special Wheat Compound	10.00	1.65	4.00
Special Corn Compound	10.00	1.65	4.00
Special Vegetable Compound	10.00	1.65	4.00
Special Potato Compound	10.00	1.65	4.00
Special Corn Grower	8.00	1.65	6.00
Special Wheat Grower	8.00	1.65	6.00
Special Potato Grower	8.00	1.65	6.00
Special Vegetable Grower	8.00	1.65	6.00
Old Time Fish Scrap Guano	10.00	1.65	2.00
Standard Corn Grower	8.00	1.65	2.00
Planters' Soluble Fertilizer	8.00	1.65	2.00
Golden Grain Compound	8.00	.82	3.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	50.00
Asheville Packing Co., Asheville, N. C.—			
Asheville Packing Co.'s Extra H. G. Potash Mixture	13.00	....	4.00
Asheville Packing Co.'s Extra H. G. Fertilizer	10.00	3.30	4.00
Asheville Packing Co.'s Extra H. G. Blood and Bone	10.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Asheville Packing Co.'s Extra H. G. Cotton Special	10.00	1.65	4.00
Asheville Packing Co.'s H. G. Wheat, Corn and Oat Special	10.00	1.65	2.00
Asheville Packing Co.'s High Grade Biltmore Wheat Grower	10.00	1.65	2.00
Asheville Packing Co.'s Standard Bone and Potash	10.00	.82	1.00
Asheville Packing Co.'s H. G. Special Potash Mixture	10.00	....	4.00
Asheville Packing Co.'s Special XXX Wheat Grower	10.00	....	2.00
Asheville Packing Co.'s Standard Potato	9.00	.82	2.00
Asheville Packing Co.'s Extra H. G. Vegetable Special	8.00	4.12	5.00
Asheville Packing Co.'s H. G. Special Tobacco and Vegetable Fertilizer	8.00	2.47	3.00
Asheville Packing Co.'s Extra H. G. Potato Special	8.00	1.65	6.00
Asheville Packing Co.'s Complete Fertilizer	8.00	1.65	2.00
Asheville Packing Co.'s Corn and Wheat	8.00	.82	3.00
Asheville Packing Co.'s Special Bone and Potash	8.00	....	4.00
Baugh & Sons Co., Phila., Pa., and Norfolk, Va.—			
Baugh's Raw Bone Meal, Warranted Pure, Total	21.50	3.70	....
Baugh's 16 Per Cent Acid Phosphate	16.00	....	....
Baugh's Pure Bone and Muriate of Potash Mixture .....Total	15.00	2.47	5.00
Baugh's High Grade Acid Phosphate	14.00	....	....
Baugh's Pure Dissolved Animal Bones	13.00	2.06	....
Baugh's High Grade Cotton and Truck Guano,	10.00	1.65	2.00
Baugh's High Grade Potash Mixture	10.00	....	4.00
Baugh's Soluble Alkaline Superphosphate	10.00	....	2.00
Baugh's Special Guano	8.00	3.30	6.00
Baugh's Fish, Bone and Potash	8.00	3.30	4.00
Baugh's Fruit and Berry Guano	8.00	2.47	10.00
Baugh's Special Tobacco Guano	8.00	2.47	5.00
Baugh's Grand Rapids High Grade Truck Guano	8.00	2.47	3.00
Baugh's Sweet Potato Guano for Sweet Potatoes, Peas and Melons	8.00	2.47	3.00
Baugh's High Grade Tobacco Guano	8.00	2.47	3.00
Baugh's Complete Animal Base Fertilizer	8.00	1.65	5.00
Baugh's Fish Mixture	8.00	1.65	2.00
Baugh's Animal Base and Potash Compound for all Crops	8.00	1.65	2.00
Baugh's Wheat Fertilizer for Wheat and Grass,	8.00	1.65	2.00
Baugh's Southern States Excelsior Guano	8.00	1.21	3.00
Baugh's Southern States Guano for Bright Tobacco	7.00	2.88	7.00
Baugh's Potato and Truck Special	7.00	2.88	7.00
Baugh's Fine Ground Fish	6.87	8.23	....
Baugh's 7 Per Cent Potato Guano	6.00	5.76	5.00
Baugh's Cabbage Guano	6.00	5.76	5.00
Baugh's Peruvian Guano Substitute for Potatoes and All Vegetables	6.00	4.12	7.00
Baugh's 5—6—5 Guano	6.00	4.12	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Baugh's New Process 10 Per Cent Guano	5.00	8.23	2.50
Baugh's Special Potato Manure	5.00	1.65	10.00
Baugh's Wrapper Leaf Brand for Seed Leaf Tobacco	3.50	3.30	5.00
Baugh's Soluble Top Dresser for All Crops	....	8.23	3.00
Baugh's Fine Ground Tankage	....	7.40	....
Randolph's Bone and Potash Mixture for All Crops	10.00	....	3.00
Hassell's Tobacco Guano	9.00	2.26	2.00
Glover's Special Potato Guano	7.00	3.30	8.00
Wilson's Special for Tobacco	6.00	2.47	6.00
Sulphate of Ammonia	....	20.57	....
Nitrate of Soda	....	15.23	....
Fine Ground Blood	....	13.00	....
Muriate of Potash	....	....	48.00
High Grade Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
M. J. Best & Sons, Goldsboro, N. C.			
Genuine German Kainit	....	....	12.00
W. G. Buie Co., Laurinburg, N. C.—			
Nitrate of Soda	....	14.85	....
J. A. Benton, Ruffin, N. C.—			
Benton's North Carolina Bright Fertilizer	9.00	1.65	2.00
Baltimore Fertilizer Co., Baltimore, Md.—			
Honest Acid Phosphate	14.00	....	....
Honest Bone and Potash	10.00	....	2.00
Honest Sweet Potato Grower	8.00	2.40	4.00
Honest Ammoniated Bone	8.00	1.60	2.00
Honest Revenue	7.00	2.40	6.00
Honest Success	7.00	.82	4.00
Honest Dixie Trucker	6.00	4.00	7.00
Honest Trucker	6.00	4.00	5.00
Blackstone Guano Co., Inc., Blackstone, Va.—			
Blackstone Raw Bone.....Total	20.00	3.60	....
Blackstone Corn Fertilizer	10.00	1.03	1.00
Pure Animal Bone.....Total	20.00	3.30	....
B. G. Co., Inc., Acid Phosphate	14.00	....	....
B. G. Co., Inc., Bone and Potash	10.00	....	4.00
B. G. Co., Inc., Bone and Potash	10.00	....	2.00
Special Compost	11.00	1.03	....
Dissolved Bone	10.00	1.03	1.00
King of Corn Fertilizer	10.00	1.03	1.00
Blackstone Special for Tobacco	9.00	2.47	3.00
Old Bellefonte	8.00	3.30	2.00
King of Tobacco Fertilizer	8.00	3.30	2.00
Tobacco Special	8.00	2.47	3.00
Prize Winner	8.00	2.47	3.00
Wrapper Brand	8.00	2.47	3.00
Jim Crow for Tobacco	8.00	2.47	3.00
Bellefonte	8.00	2.47	2.00
Prize Winner	8.00	2.47	2.00
Hard Cash	8.00	2.06	2.00
Carolina Special for Tobacco	8.00	1.65	4.00
Standard Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Red Letter for Tobacco	8.00	1.65	2.00
Alliance for Tobacco	8.00	1.65	2.00
Leader for Tobacco	8.00	1.65	2.00
Peanut Special	8.00	1.03	6.00
John L. Bailey Co., Elm City, N. C.—			
Fairmont Guano	8.00	2.47	3.00
Stag Brand Fertilizer	8.00	1.65	2.00
C. J. Burton Guano Co., Baltimore, Md.—			
Acid Phosphate	14.00	....	....
High Grade Tobacco	8.00	3.29	4.00
Burton's Best	8.00	2.47	3.00
Burton's High Grade	8.00	2.06	3.00
Burton's Butcher Bone	8.00	1.65	2.00
Tobacco Queen	8.00	2.47	3.00
Bradley Fertilizer Co., Charleston, S. C.—			
High Grade Bradley's Dissolved Phosphate	16.00	....	....
High Grade Bradley's Acid Phosphate	14.00	....	....
High Grade Bradley's Potash Acid Phosphate,	10.00	....	4.00
High Grade Bradley's Circle Guano	8.00	3.29	4.00
High Grade Bradley's Guano	8.00	2.46	3.00
Standard Bradley's XXX Acid Phosphate	13.00	....	....
Standard Bradley's Acid Phosphate	12.00	....	....
Standard Bradley's Palmetto Acid Phosphate,	12.00	....	....
Standard Bradley's Wheat Grower	10.00	....	2.00
Standard Bradley's Bone and Potash	10.00	....	2.00
Standard Bradley's Ammoniated Dissolved Bone	9.00	1.85	1.00
Standard Bradley's Patent Superphosphate	9.00	1.85	1.00
Standard Bradley's Cereal Guano	8.00	1.65	2.00
Standard Bradley's X Guano	8.00	1.65	2.00
Standard B. D. Sea Fowl Guano	9.00	1.85	1.00
Standard Eagle Ammoniated Bone Superphosphate	9.00	1.85	1.00
German Kainit	....	....	12.00
The Bryant Fertilizer Co., Alexandria, Va.—			
Bryant's Fine Ground Raw Bone.....Total	22.50	3.70	....
Bryant's S. C. Dissolved Bone	14.00	....	....
Bryant's Bone and Potash Mixture	10.00	....	2.00
Bryant's Bone Mixture for Tobacco	9.00	2.06	2.00
Bryant's "Challenge" Highest Grade Tobacco Mixture	9.00	2.47	3.00
Bryant's "Victor" Tobacco Fertilizer	8.00	2.47	3.00
Bryant's "Otter" Special Tobacco Fertilizer	8.00	2.06	3.00
Bryant's "Potomac" Bone Special for Tobacco.	8.00	1.65	2.00
The Berkley Chemical Co., Norfolk, Va.—			
Pure Ground Bone.....Total	20.00	3.70	....
Resolute Acid Phosphate	16.00	....	....
Berkley Acid Phosphate	14.00	....	....
Berkley Bone and Potash Mixture	11.00	....	2.00
Berkley Plant Food	10.00	....	4.00
Berkley Tobacco Guano	8.00	2.47	3.00
Laurel Potash Mixture	10.00	....	2.00
Monitor Animal Bone Fertilizer	9.00	1.85	4.00
Advance Crop Grower	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Select Crop Grower	8.00	2.06	2.50
Brandon Superphosphate	8.00	1.65	2.00
Long Leaf Tobacco Grower	8.00	1.65	2.00
Berkley Peanut and Grain Grower	8.00	1.00	4.00
Superior Bone and Potash	8.00	....	4.00
Mascot Truck Guano	7.00	4.12	5.00
Victory Special Crop Grower	7.00	3.29	4.00
Royal Truck Grower	6.00	5.76	5.00
The Leader of the World	5.00	3.29	5.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Bragaw Fertilizer Co., Washington, N. C.—			
Palmetto Acid Phosphate	14.00	....	....
Long Acre Bone Phosphate	14.00	....	....
Farmers' Union Meal Mixture	9.00	2.26	2.00
Beaufort County Guano	8.00	2.47	3.00
Havana Tobacco Guano	8.00	2.47	3.00
Tuckahoe Tobacco Guano	8.00	2.06	3.00
Old Reliable Premium Guano	8.00	1.65	2.00
Tar Heel Guano	8.00	1.65	2.00
Pamlico Trucker	7.00	4.12	8.00
Riverview Potato Grower	6.00	5.76	5.00
Chocowinity Special Tobacco Guano	5.00	3.29	6.00
Sunrise Tobacco Guano	4.00	2.47	5.00
Genuine German Kainit	....	....	12.00
Conestee Chemical Co., Wilmington, N. C.—			
Conestee 16 Per Cent Acid Phosphate	16.00	....	....
Conestee High Grade Acid Phosphate	14.00	....	....
Conestee High Grade Guano	6.00	4.95	8.00
Conestee Acid Phosphate	13.00	....	....
Conestee Bone and Potash	11.00	....	2.00
Conestee Bone and Potash	10.00	....	2.00
Conestee Bone and Potash	10.00	....	3.00
Conestee Bone and Potash	10.00	....	4.00
Conestee Bone and Potash	8.00	....	4.00
Conestee Cotton Guano	9.00	2.27	2.00
Conestee Cotton Grower	9.00	2.26	2.00
Conestee Melon Grower	8.00	4.22	7.00
Conestee Melon Grower	8.00	4.12	7.00
Conestee P. D. Q. Fertilizer	8.00	3.30	4.00
Conestee P. D. Q. Fertilizer for Tobacco	8.00	3.29	4.00
Conestee Special Fertilizer for Tobacco	8.00	2.47	3.00
Conestee Fertilizer for Tobacco	8.00	2.47	2.50
Conestee Fertilizer	8.00	2.47	2.50
Conestee Crop Guano	8.00	2.06	3.00
Conestee Tobacco Grower	8.00	2.06	3.00
Conestee Complete Fertilizer	8.00	2.06	2.00
Conestee Complete Fertilizer	8.00	2.06	2.00
Conestee Standard Guano	8.00	1.65	2.00
Conestee Root Crop Guano	7.00	4.10	7.00
Conestee Truck Grower	6.00	3.30	8.00
Conestee Corn Guano	6.00	2.47	3.00
Conestee Pure German Kainit	....	....	12.00
Nitrate of Soda	....	15.05	....
Conestee Top Dresser	....	7.41	3.00
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
E. W. Browley, Mooresville, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Leo	8.00	2.47	3.00
16 Per Cent Dried Blood	....	13.17	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Columbia Guano Co., Norfolk, Va.—			
Pure Raw Bone Meal.....Total	21.50	3.71	....
Columbia High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Columbia 14 Per Cent Acid Phosphate	14.00	....	....
Columbia Dissolved Bone	13.00	....	....
Columbia Acid Phosphate	12.00	....	....
Columbia 11 and 5 Bone and Potash Mixture	11.00	....	5.00
Columbia 10-5 Bone and Potash Mixture	10.00	....	5.00
Columbia 10 and 4 Bone and Potash Mixture	10.00	....	4.00
Columbia Bone and Potash for Grain	10.00	....	3.00
Columbia Bone and Potash Mixture	10.00	....	2.00
Columbia C. S. M. Special	9.00	2.27	2.00
Columbia Special Truck Guano	8.00	3.30	4.00
Columbia Special 4-8-3	8.00	3.30	3.00
Columbia Special Tobacco Guano	8.00	2.06	2.00
Columbia Special Wheat Fertilizer	8.00	1.65	2.00
Columbia Soluble Guano	8.00	1.65	2.00
Columbia 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Columbia Special 7 Per Cent Truck Guano	7.00	5.77	7.00
Columbia Potato Guano	7.00	4.12	5.00
Columbia Top Dresser	....	7.42	3.00
McRae's Special	9.00	4.12	7.00
McRae's High Grade Guano	8.00	3.30	7.00
Pelican Ammoniated Guano	9.00	3.30	4.00
Roanoke Ammoniated Guano	9.00	1.65	3.00
Carolina Soluble Guano	9.00	1.65	1.00
Trojan Tobacco Guano	8.00	3.30	4.00
Hayes' Special	8.00	3.30	3.00
Olympia Cotton Guano	8.00	2.47	3.00
Hyco Tobacco Guano	8.00	2.47	3.00
Our Best Meal Guano	8.00	2.47	3.00
Spinola Peanut Grower	8.00	1.02	4.00
Crown Brand Peanut Guano	7.00	....	5.00
Crew's Special	5.85	4.49	10.00
Nitrate of Soda	....	15.22	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Cumberland Bone and Phosphate Co., Portland, Me., and Charleston, S. C.—			
Standard Cumberland Bone and Superphosphate of Lime	9.00	1.85	1.00
The Coe-Mortimer Co., Charleston, S. C.—			
Thomas Phosphate Ex. S.S. Richmond Total	18.00	....	....
Maltassa Guano .....Total	4.40	5.26	3.80
Imported Ground Fish Guano, No. 3	2.00	9.03	....
Imported Ground Fish Guano, No. 2	2.00	8.46	....
Imported Ground Fish Guano, No. 1	2.00	8.23	....
High Grade Tankage	2.00	8.22	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate of Soda	....	14.76	....
Dried Blood, No. 3	....	14.19	....
Dried Blood, No. 2	....	13.57	....
Dried Blood, No. 1	....	13.16	....
Nitrate Potash	....	12.30	44.00
Muriate of Potash	....	....	56.00
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Muriate Mixture	....	....	20.00
Genuine German Kainit	....	....	12.00
Combahee Fertilizer Co., Charleston, S. C.—			
Dissolved Bone 16 Per Cent	16.00	....	....
Dissolved Bone 14 Per Cent	14.00	....	....
Dissolved Bone 13 Per Cent	13.00	....	....
K. M. S	8.00	3.30	4.00
King Cotton	8.00	2.47	4.00
H. G. Cotton	8.00	2.47	3.00
H. G. Cotton	8.00	1.67	2.00
Nitrate of Soda	....	14.83	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Calder Bros., Wilmington, N. C.—			
Nitrate of Soda	....	14.80	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Craven Chemical Co., New Bern, N. C.—			
Jewel Acid Phosphate	14.00	....	....
Trent Bone and Potash	10.00	....	2.00
Halifax Guano	9.00	2.47	3.00
Prolix 9-2-3, Special Guano	9.00	1.65	3.00
Hanover Standard Guano	8.00	3.29	4.00
Duplin Tobacco Guano	8.00	2.47	3.00
Gaston High Grade Fertilizer	8.00	2.47	3.00
C. E. Foy High Grade Guano	8.00	2.47	3.00
Marvel Great Crop Grower	8.00	2.06	3.00
Elite Cotton Guano	8.00	1.65	2.00
Pantego Potato Guano	7.00	4.12	7.00
Neuse Truck Grower	6.00	4.94	6.00
Craven Chemical Co.'s Truck Guano, 5-10-2½	5.00	8.24	2.50
Genuine German Kainit	....	....	12.00
William H. Camp, Petersburg, Va.—			
Camp's Acid Phosphate	16.00	....	....
Camp's Acid Phosphate	14.00	....	....
Camp's Shepherd Brand Bone and Potash	10.00	....	4.00
Camp's Bone and Potash	10.00	....	2.00
Camp's Yellow Head Chemicals	8.00	2.87	7.50
Camp's Special for Tobacco	8.00	2.46	3.00
Camp's Red Head Chemicals	8.00	2.25	2.00
Camp's Green Head Chemicals, Irish Potato	7.00	6.15	10.00
Lion and Monkey, 8-2-2	8.00	1.65	2.00
Nitrate Soda	....	14.76	....
German Kainit	....	....	12.00
Clayton Oil Mill, Clayton, N. C.—			
C. O. M. 16 Per Cent Acid Phosphate	16.00	....	....
C. O. M. 14 Per Cent Acid Phosphate	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
C. O. M. Bone and Potash	12.00	....	5.00
C. O. M. Special Corn Mixture	10.00	....	5.00
C. O. M. Wheat Compound	10.00	2.06	4.50
C. O. M. German Kainit	....	....	12.00
C. W. H. Special	8.00	4.13	5.00
Clayton Guano	8.00	2.47	3.00
Clayton Special Tobacco Grower	8.00	2.47	3.00
Clayton Oil Mill C. O. M. Planters' Favorite,	8.00	2.47	3.00
Cotton Queen	8.00	1.65	2.00
Summer Queen	8.00	1.65	2.00
Cowell, Swan & McCotter Co., Bayboro, N. C.—			
Bone Phosphate	14.00	....	....
Standard Cotton Grower	8.00	3.30	3.00
Champion Guano	8.00	2.47	3.00
Cowell's Great Tobacco Grower	8.00	2.47	3.00
Quick Grower Guano	8.00	2.06	3.00
Rust Proof Cotton Guano	8.00	1.65	3.00
Crop Guano	8.00	1.65	2.00
Great Cabbage and Potato Guano	7.00	5.77	7.00
Oriental Trucker	7.00	4.12	8.00
Aurora Trucker	7.00	4.12	7.00
High Grade Truck Guano	7.00	4.12	5.00
Potato Favorite Guano	7.00	3.30	7.00
Cowell, Swan & McCotter Co.'s Cabbage Guano,	5.00	8.25	2.50
German Kainit	....	....	12.00
Chickamauga Fertilizer Works, Atlanta, Ga.—			
Chickamauga High Grade Dissolved Bone, No. 16	16.00	....	....
Chickamauga High Grade Dissolved Bone	14.00	....	....
Chickamauga High Grade Fertilizer	10.00	1.65	2.00
Chickamauga High Grade Plant Food	10.00	1.65	2.00
Chickamauga 13-4	13.00	....	4.00
Chickamauga Potash Special, No. 4	12.00	....	4.00
Chickamauga Potash Special	12.00	....	2.00
Chickamauga Dissolved Bone	12.00	....	....
Chickamauga Very Best	10.00	3.30	4.00
Chickamauga Fish Scrap Guano	10.00	1.65	2.00
Chickamauga Wheat Special	10.00	.82	3.00
Chickamauga Corn Special	10.00	.82	3.00
Chickamauga Wheat and Corn Grower, No. 6.	10.00	....	6.00
Chickamauga Wheat and Corn Grower, No. 5.	10.00	....	5.00
Chickamauga Wheat and Corn Grower	10.00	....	4.00
Chickamauga Bone and Potash	10.00	....	2.00
Chickamauga Blood, Bone and Tankage Guano,	9.00	.82	2.00
Chickamauga Complete Fertilizer	8.00	1.65	2.00
Chickamauga Standard Corn Grower	8.00	1.65	2.00
Chickamauga Standard Wheat Grower	8.00	1.65	2.00
Chickamauga Alkaline Bone, No. 6	8.00	....	6.00
Chickamauga Alkaline Bone, No. 5	8.00	....	5.00
Ben Hur H. G. Guano	10.00	2.47	3.00
Old Glory Mixture	10.00	.82	1.00
Special Wheat Compound	10.00	1.65	4.00
Special Wheat Grower	8.00	1.65	6.00
Special Vegetable Compound	10.00	1.65	4.00
Special Vegetable Grower	8.00	1.65	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos Acid.	Nitrogen.	Potash.
Special Corn Compound	10.00	1.65	4.00
Special Corn Grower	8.00	1.65	6.00
Georgia Home Guano	8.00	1.65	2.00
No. 3 Bone, Tankage and Potash Mixture	8.00	.82	3.00
Canton Fertilizer Co., Canton, Ga.—			
H. G. Dissolved Bone	16.00	....	....
H. G. Dissolved Bone	14.00	....	....
R. T. Jones Extra H. G.	10.00	2.47	3.00
North Georgia High Grade	10.00	2.06	3.00
Jemco High Grade	10.00	1.65	2.00
Jemco Standard Grade	8.00	1.65	2.00
Southern King High Grade	10.00	1.65	2.00
Southern King Standard Grade	8.00	1.65	2.00
Quickstep Wheat and Grain Grower	10.00	.82	3.00
Special Potash Mixture	10.00	....	4.00
Dissolved Bone and Potash	8.00	....	4.00
Cumbahee Fertilizer Co., Charleston, S. C.—			
Melon Fertilizer	10.00	3.30	5.00
Canteloupe Fertilizer	10.00	2.46	10.00
Nitrate of Soda	....	14.83	....
Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Climax Dissolved Bone	14.00	....	....
Sterling Acid Phosphate	13.00	....	....
Stable Acid Phosphate	12.00	....	....
Horne & Son's High Grade Bone and Potash	11.00	....	5.00
Special Bone and Potash Mixture	10.00	....	4.00
Morris & Scarboro's Special Bone and Potash	10.00	....	3.00
Electric Bone and Potash Mixture	10.00	....	2.00
Pacific Tobacco and Cotton Grower	9.00	2.26	2.00
Horne's Best	8.00	2.47	3.00
Eclipse Ammoniated Guano	8.00	2.47	2.00
Planters' Pride	8.00	2.06	3.00
Caraleigh Special Tobacco Guano	8.00	2.06	3.00
Ely Ammoniated Fertilizer	8.00	1.65	2.00
Crown Ammoniated Guano	8.00	1.65	2.00
Comet Guano	8.00	.82	3.00
Buncombe Wheat Grower	8.00	....	4.00
Buncombe Corn Grower	8.00	....	4.00
Caraleigh Top Dresser	3.00	8.24	4.00
Nitrate of Soda	....	15.65	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
W. B. Cooper, Wilmington, N. C.—			
Nitrate of Soda	....	15.76	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Contentnea Guano Co., Wilson, N. C.—			
Contentnea 16 Per Cent Acid	16.00	....	....
High Grade 14 Per Cent Acid	14.00	....	....
Bone and Potash Mixture	10.00	....	4.00
Special Formula Fertilizer	9.00	2.06	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Special Formula	8.00	2.47	6.00
Special Formula 8-4-5	8.00	3.29	5.00
Special Formula for Tobacco	8.00	3.28	7.00
Special Formula Fertilizer	8.00	3.29	4.00
Special Formula for Tobacco	8.00	2.88	5.00
Special Formula	8.00	2.47	4.00
Special Tobacco Formula	8.00	2.06	6.00
Special Formula	8.00	2.05	5.00
Special Formula for Cotton	7.00	2.47	3.25
8-4½-7 for Tobacco	8.00	3.70	7.00
8-4½-7 for Cotton	8.00	3.70	7.00
Howard & Williams' Cotton Special	8.00	2.47	5.00
Pick Leaf	8.00	2.47	3.00
Top Notch	8.00	2.47	3.00
Contentnea Cotton Grower	8.00	2.47	2.50
Contentnea Corn Special	5.00	1.65	5.00
Contentnea Top Dresser	3.00	8.23	5.00
Blood and Bone Cotton Compound	8.00	1.65	2.00
Howard & Williams' Tobacco Special	8.00	2.90	5.00
Whitehead Farm Cotton Grower	6.00	2.47	5.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	50.00
German Kainit	....	....	12.00
Dunn Oil Mills Co., Dunn, N. C.—			
Dunn Oil Mills Hustler	8.00	2.47	3.00
Sampson Cotton Grower	8.00	1.65	2.00
C. P. Dey, Beaufort, N. C.—			
Ground Fish Scrap	6.00	9.37	....
Dixie Guano Co., Savannah, Ga.—			
High Grade	10.00	1.85	2.75
High Grade	8.00	3.30	4.00
Phosphoric Acid	16.00	....	....
Phosphoric Acid	14.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
Bone and Potash	8.00	....	4.00
Blood and Bone	9.00	1.64	3.00
Blood, Bone and Potash	8.75	1.64	2.00
Farmers' Favorite H. G. Fertilizer	8.00	2.47	3.00
Standard Grade Fertilizer	8.00	1.64	4.00
Standard Grade	8.00	1.64	2.00
Beats All	9.00	1.64	2.00
Dixie Guano Co., Durham, N. C.—			
Dixie 16 Per Cent Acid Phosphate	16.00	....	....
Dixie 14 Per Cent Acid Phosphate	14.00	....	....
Dixie Champion for Wheat and Corn	10.50	....	1.50
Dixie Star Ammoniated	9.00	1.65	1.00
Dixie Corn Fertilizer	9.00	.82	3.00
Dixie Tobacco Fertilizer	8.00	2.46	3.00
Dixie Cotton Fertilizer	8.00	1.65	2.00
Jeff Davis Special	9.00	2.26	2.00
Radium Brand Guano	8.00	3.28	5.00
Carolina Special Ammoniated	8.00	2.46	3.00
Sulky Plow Brand Guano	8.00	2.46	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Battle's Blood and Bone Fertilizer	8.00	2.05	3.00
Niagara Soluble Bone	8.00	2.05	2.00
Old Plantation Superphosphate	8.00	1.65	2.00
J. L. Everett, Rockingham, N. C.—			
Hard Salts	....	....	16.00
Etiwan Fertilizer Co., Charleston, S. C.—			
Etiwan 16 Per Cent Acid Phosphate	16.00	....	....
Etiwan High Grade Acid Phosphate	14.00	....	....
Etiwan Dissolved Bone	13.00	....	....
Etiwan Acid Phosphate with Potash	11.00	....	1.00
Etiwan Potash Bone	10.00	....	4.00
Etiwan Soluble Bone with Potash	10.00	....	3.00
Etiwan Blood and Bone Guano	9.00	2.06	1.00
Etiwan 9-2-3 Per Cent Ammoniated Fertllizer,	9.00	1.65	3.00
Etiwan Superior Cotton Fertilizer	8.00	3.30	6.00
Etiwan Special Cotton Fertilizer	8.00	3.30	4.00
Etiwan Cotton Compound	8.00	2.47	3.00
Etiwan High Grade Cotton Fertilizer	8.00	2.47	2.00
Etiwan Ammoniated Fertilizer	8.00	1.65	2.00
Etiwan Special Potash Mixture	8.00	....	4.00
Diamond Soluble Bone	13.00	....	....
Plow Brand Acid Phosphate with Potash	11.00	....	1.00
Plow Brand Raw Bone Superphosphate	9.00	2.06	1.00
Plow Brand Ammoniated Dissolved Bone	8.75	1.65	2.00
Plow Brand Special Tobacco Fertilizer	8.00	3.30	4.00
Plow Brand Ammoniated Fertilizer	8.00	1.65	2.00
Diamond Soluble Bone with Potash	10.00	....	2.00
XX Acid Phosphate with Potash	10.00	....	2.00
Special for Cotton	9.00	2.47	7.00
Special Formula for Tobacco	8.00	2.47	5.00
Special Formula	7.00	2.05	6.00
Genuine German Kainit	....	....	12.00
Eastern Cotton Oil Co., Hertford, N. C.—			
Acid Phosphate	16.00	....	....
Mat White Special	8.00	3.30	4.00
Rain-proof Cotton Grower	8.00	2.47	2.00
Perquimans Favorite	8.00	1.65	2.00
Nun-Such Potato Grower	6.00	4.12	7.00
Genuine German Kainit	....	....	12.00
Farmers' Fertilizer Co., Spartanburg, S. C.—			
Phosphoric Acid	16.00	....	....
Phosphoric Acid	14.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
High Grade	10.00	3.30	4.00
High Grade	10.00	1.85	2.75
High Grade	10.00	1.65	2.00
High Grade	8.00	3.30	4.00
Beats All 9-2-2	9.00	1.64	2.00
Blood and Bone	9.00	1.64	3.00
Blood, Bone and Potash	8.75	1.64	2.00
Farmers' Favorite H. G. Fertilizer	8.00	2.47	3.00
Standard Grade Fertilizer	8.00	1.64	4.00
Standard Grade	8.00	1.64	2.00
Bone and Potash	8.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Farmers Guano Co., Ralcigh, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Farmers' Acid Phosphate	13.00	....	....
Farmers' Formula	7.00	2.47	3.25
Farmers' Top Dresser	3.00	8.24	4.00
Special Bone and Potash Mixture	10.00	....	4.00
Century Bone and Potash Mixture	10.00	....	2.00
Golden Grade Guano	8.00	2.47	3.00
Big Crop Guano	8.00	2.06	3.00
Toco Tobacco Guano	8.00	2.06	3.00
State Standard Guano	8.00	1.65	2.00
Special Bone and Potash	8.00	....	4.00
Nitrate of Soda	....	15.65	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Floradora Guano Co., Laurinburg, N. C.—			
Rocky Ford	10.00	2.47	7.00
Humus	10.00	3.29	5.00
Florena	8.00	3.29	4.00
Floradora	8.00	3.29	4.00
Oceola	8.00	2.47	3.00
Rob Roy	8.00	2.47	3.00
Red Raven	8.00	1.65	3.00
Scotland Special	6.40	2.13	3.00
Fremont Oil Mills, Fremont, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Carolina C. S. M. Compound	9.00	2.26	2.00
Fomco	8.00	3.29	4.00
Fremont H. G. Guano	8.00	3.29	4.00
Fremont Oil Mill Co.'s Special for Tobacco	8.00	2.47	5.00
Fremont Tobacco Guano	8.00	2.47	5.00
Fremont Standard Fertilizer	8.00	2.47	3.00
Y. & W. Tobacco Special	8.00	2.47	5.00
Wayne County Standard	8.00	2.47	3.00
Square Deal	8.00	2.47	3.00
Nahunta Special	8.00	2.47	3.00
A. A. Special Formula	8.00	2.06	3.00
Up-to-date	8.00	1.65	2.00
Home Run	8.00	1.65	2.00
Y. & W. Cotton Compound	8.00	1.65	2.00
Nitrate of Soda	....	14.85	....
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
Farmers Cotton Oil Co., Wilson, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Bonum Acid Phosphate	14.00	....	....
Contentnea Acid Phosphate	13.00	....	....
Washington's Corn Mixture Guano	10.00	.82	5.00
Xtra Good Bone and Potash	10.00	....	2.00
Dean's Special Guano	8.00	3.70	7.00
Regal Tobacco Guano	8.00	2.88	5.00
Newsome's Tobacco Special	8.00	2.47	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
J. D. Farrior's Special Guano	8.00	2.47	3.00
Graves' Cotton Grower Guano	8.00	2.47	3.00
Golden Gem Guano	8.00	2.47	3.00
Wilson High Grade Guano	8.00	2.27	2.00
Planters' Friend Guano	8.00	2.06	3.00
Carolina Choice Tobacco Guano	8.00	2.06	3.00
Crop King Guano	8.00	1.65	2.00
Farmers' Special Guano	8.00	1.65	2.00
Rogers' Truck Grower	7.00	5.76	7.00
Wilson Top Dresser	2.00	9.05	4.00
Perfect Top Dresser	2.00	8.23	5.00
Sulphate of Ammonia	....	20.57	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Franklin Cotton Oil and Fertilizer Co., Inc., Franklin, Va.—			
Pretlow & Co.'s H. G. Acid Phosphate	16.00	....	....
Pretlow & Co.'s H. G. Truck Fertilizer	8.00	4.12	5.00
Pretlow & Co.'s Cotton-seed Meal Mixture	8.00	2.47	3.00
Pretlow & Co.'s Champion Guano	8.00	1.65	2.00
Pretlow & Co.'s Peanut Grower	8.00	1.00	4.00
Pretlow & Co.'s Genuine German Kainit	....	....	12.00
Griffith & Boyd Co., Baltimore, Md.—			
High Grade Acid Phosphate	14.00	....	....
Ammoniated Bone Phosphate	8.00	1.65	2.00
Spring Crop Grower	6.50	1.65	4.50
Seven Per Cent Guano	5.00	5.77	5.00
Netro Crop Feeder	....	7.40	2.50
Genuine German Kainit	....	....	12.00
Germofert Manufacturing Co., Charleston, S. C.—			
Germofert Patented Standard Cotton Grower	8.00	1.65	2.00
Germofert Patented Special Cotton Grower	6.00	2.47	3.00
Germofert Patented Extra Special Cotton Grower	4.00	3.29	4.00
Germofert Patented Tobacco Grower	2.00	3.29	6.00
R. C. Gilliam, Norfolk, Va.—			
Gilliam's 7 Per Cent Potato Guano	6.00	5.76	7.00
Gilliam's Special Potato Guano	6.00	5.76	6.00
German Kali Works, New York, N. Y.—			
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00
Griffith & Turner Company, Baltimore, Md.—			
H. G. Acid Phosphate	14.00	....	....
Animal Bone Phosphate	10.00	2.06	1.50
Home Fertilizer and Chemical Co., Baltimore, Md.—			
Champion Dissolved Phosphate	16.00	....	....
Home High Grade Acid Phosphate	14.00	....	....
Home Bone and Potash	10.00	....	5.00
Home Alkaline Bone	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Home Ammoniated Bone	9.00	1.65	3.00
Home B. G. Ammoniated Compound	9.00	.82	5.00
Home Standard Guano	8.00	4.12	6.00
Home Potato Special	8.00	1.65	10.00
Home Vegetable Fertilizer	6.00	4.12	6.00
Home Potato Grower	6.00	3.30	4.00
Home Fertilizer	....	5.77	7.00
Boykin's Dissolved Animal Bone	12.00	1.65	....
Everybody's Fertilizer	9.00	.82	2.00
Special C. & C. Compound	8.00	2.48	3.00
Zancey's Formula for Yellow Leaf Tobacco	8.00	2.48	2.00
Phœnix Crop Grower	8.00	2.48	2.00
Matchless Guano	8.00	1.65	4.00
Boykin's Cereal Fertilizer	8.00	1.65	2.00
Ammoniated Bone Manure	7.00	1.65	5.00
Farmers' Choice	7.00	.82	4.00
Truckers' Special Compound	6.00	5.77	5.00
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.27	....
Cerealite Top Dresser	....	7.43	3.00
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Hadley, Harris & Co., Wilson, N. C.—			
Hadley's Special 8-4½-7 Mixture	8.00	3.70	7.00
Hadley's Tobacco and Cotton Special	8.00	2.47	5.00
Hadley Boss Guano	8.00	2.26	2.50
Golden Weed Tobacco Grower	8.00	2.47	3.00
Daisy Fish Mixture	8.00	1.65	2.00
Top Dressing	2.00	8.23	5.00
Nitrate of Soda	....	15.60	....
German Kainit	....	....	12.00
Hampton Guano Co., Norfolk, Va.—			
Pure Ground Bone	20.00	3.70	....
Supreme Acid Phosphate	16.00	....	....
Hampton Acid Phosphate	14.00	....	....
Hampton Bone and Potash Mixture	11.00	....	2.00
Hampton Crop Grower	10.00	....	4.00
Hampton Tobacco Guano	8.00	2.47	3.00
Hampton Special Grain and Peanut Fertilizer,	8.00	1.00	4.00
Dauntless Potash Mixture	10.00	....	2.00
Arlington Animal Bone Fertilizer	9.00	1.85	4.00
Alpha Crop Grower	8.50	2.06	2.50
P. P. P. (Princess Prolific Producer)	8.00	2.47	3.00
Extra Tobacco Guano	8.00	1.65	2.00
Shirley's Superphosphate	8.00	1.65	2.00
Excelsior Bone and Potash	8.00	....	4.00
Reliance Truck Guano	7.00	4.11	5.00
Little's Favorite Crop Grower	7.00	3.29	4.00
Virginia Truck Grower	6.00	5.76	5.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
S. B. Harrell & Co., Inc., Norfolk, Va.—			
Harrell's Acid Phosphate	14.00	....	....
Harrell's Eclipse	9.00	2.26	2.00
Harrell's Champion Cotton and Peanut Grower,	8.00	1.65	2.00
Harrell's Truck Guano	6.00	5.76	5.00
M. P. Hubbard & Co., Baltimore, Md.—			
Hubbard's Soluble S. C. Phosphate	16.00	....	....
Hubbard's Havana Special for Tobacco	8.00	2.48	3.00
Hubbard's Celebrated Phosphate for General Use	8.00	1.66	2.00
Hubbard's Cannon Ball	7.00	5.74	7.00
Hubbard's Maryland Special Vegetable Grower,	7.00	4.13	5.00
Hubbard's Special Cotton and Corn Fertilizer,	7.00	1.65	5.00
Hubbard's 7 Per Cent Bermuda Guano	6.00	5.78	5.00
Nitrate of Soda	....	15.60	....
Ground Fish	....	8.25	....
Muriate of Potash	....	....	50.00
The Hubbard Fertilizer Co., Baltimore, Md.—			
Hubbard's 14 Per Cent Phosphate	14.00	....	....
Hubbard's Special Mixture	10.00	....	4.00
Hubbard's B. and P. Phosphate	10.00	....	2.00
Hubbard's Blood, Bone and Potash	8.00	3.32	7.00
Hubbard's Noxall	8.00	3.32	4.00
Hubbard's Royal Ensign	8.00	2.49	4.00
Hubbard's Yellow Wrapper	8.00	2.49	3.00
Hubbard's Fish Compound	8.00	1.65	3.00
Hubbard's Exchange Guano	8.00	1.65	2.00
Hubbard's Cannon Ball	7.00	5.74	7.00
Hubbard's Southern Leader	7.00	3.32	5.00
Hubbard's 5 Per Cent Royal Seal	6.00	4.15	5.00
Hubbard's New Process Top Dresser	....	7.60	3.00
Hubbard's Pure German Kainit	....	....	12.00
L. Harvey & Son Co., Kinston, N. C.—			
Nitrate of Soda	....	15.00	....
Harby & Co., Sumter, S. C.—			
Nitrate of Soda	....	14.84	....
Muriate of Potash	....	....	48.00
German Kainit	....	....	12.00
Interstate Chemical Co., Charleston, S. C.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Acid Phosphate with Potash	11.00	....	1.00
Acid Phosphate with Potash	10.00	....	4.00
Acid Phosphate with Potash	10.00	....	2.00
Acid Phosphate with Potash	8.00	....	4.00
Complete Fertilizer	9.00	2.06	1.00
Favorite Crop Grower	9.00	1.65	2.00
H. G. Ammoniated Fertilizer	8.00	3.30	4.00
Planters' Preference Guano	8.00	2.47	3.00
Challenge Brand Guano	8.00	2.06	2.00
Ammoniated Guano	8.00	1.64	2.00
Nitrate of Soda	....	14.80	....
Muriate of Potash	....	....	49.00
German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Imperial Co., Norfolk, Va.—			
Imperial 17 Per Cent Acid Phosphate	17.00	....	....
Imperial H. G. Tennessee Acid Phosphate	16.00	....	....
Imperial High Grade Acid Phosphate	14.00	....	....
Imperial Catawba Wheat Grower	10.00	....	4.00
Imperial Carolina Wheat Mixture	10.00	....	3.00
Imperial Virginia Grain Mixture	10.00	....	2.00
Imperial Bone and Potash	10.00	....	2.00
Imperial Martin County Special Crop Grower,	9.00	2.26	2.00
Imperial Snowflake Cotton Grower	8.00	3.29	4.00
Imperial Tobacco Grower	8.00	3.29	4.00
Imperial Tobacco Grower	8.00	3.29	4.00
Imperial X. L. O. Cotton Guano	8.00	2.47	3.00
Imperial Tobacco Guano	8.00	2.47	3.00
Imperial Yellow Bark Sweet Potato Guano	8.00	2.47	3.00
Imperial F. and B. Cotton Guano	8.00	2.06	3.00
Imperial Bright Tobacco Guano	8.00	2.06	3.00
Imperial Peanut Guano	8.00	1.65	4.00
Imperial Tennessee Tobacco Guano	8.00	1.65	8.00
Imperial Cotton Grower	8.00	1.65	2.00
Imperial Peanut and Corn Guano	8.00	1.65	2.00
Imperial Champion Guano	8.00	1.65	2.00
Imperial Cisco Soluble Guano	8.00	1.65	2.00
Imperial Standard Premium	8.00	1.65	2.00
Imperial Fish and Bone Grain Grower	8.00	.82	4.00
Imperial Yadkin Wheat Grower	8.00	....	4.00
Imperial 7—7—7 Potato Guano	7.00	5.76	7.00
Imperial High Grade Irish Potato Guano	7.00	4.11	8.00
Imperial Dawson's Cotton Grower	7.00	2.67	2.75
Imperial Roanoke Crop Grower	7.00	2.47	2.00
Imperial Asparagus Mixture	6.00	4.94	7.00
Imperial 5—6—7 Potato Guano	6.00	4.11	7.00
Imperial Williams' Special Potato Guano	6.00	4.11	5.00
Imperial Fish and Bone	6.00	3.29	4.00
Imperial Sweet Potato Guano	6.00	1.65	6.00
Imperial 10 Per Cent Guano	5.00	8.23	2.50
Imperial Special 7 Per Cent for Potatoes	5.00	5.76	5.00
Imperial Special Tobacco Guano	5.00	3.29	9.00
Imperial Laughinghouse Special Tobacco Guano	4.00	3.29	6.00
Imperial Conetoe Cotton Grower	4.00	3.29	4.00
Imperial Cubanola Tobacco Guano	4.00	2.47	5.00
Imperial Top Dresser for Cotton	2.00	8.23	....
Imperial Nitrate of Soda	....	15.00	....
Imperial Muriate of Potash	....	....	49.00
Imperial Manure Salt	....	....	20.00
Imperial Genuine German Kainit	....	....	12.00
R. L. Kirkwood, Bennettsville, S. C.—			
Hard Salts	....	....	16.00
Lister's Agricultural Chemical Works, Newark, N. J.—			
Lister's Standard Pure Bone Superphosphate of Lime	9.00	1.65	2.00
Lister's Ammoniated Dissolved Bone Phosphate	8.00	2.06	2.00
Lister's Success Fertilizer	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid	Nitrogen.	Potash.
A. S. Lee & Sons Co. (Inc.), Richmond, Va.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Lee's Special Wheat Fertilizer	10.00	....	2.00
Lee's H. G. Bone and Potash	9.00	....	4.00
Lee's Natural Tobacco Grower	8.00	1.64	2.00
John F. McNair, Laurinburg, N. C.—			
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
E. H. & J. A. Meadows Co., New Bern, N. C.—			
Meadows' Diamond Acid Phosphate	14.00	....	....
Meadows' Dissolved Bone and Potash Compound	10.00	....	2.00
Meadows' Lobos Guano	8.00	4.11	5.00
Meadows' Ideal Tobacco Guano	8.00	3.29	4.00
Meadows' Gold Leaf Tobacco Guano	8.00	2.47	3.00
Meadows' Roanoke Guano	8.00	2.05	3.00
Meadows' All Crop Guano	8.00	2.05	2.50
Meadows' Cotton Guano	8.00	1.64	2.00
Meadows' Great Cabbage Guano	7.00	5.76	7.00
Meadows' Great Potato Guano	7.00	4.11	8.00
Meadows' 10 Per Cent Guano	6.00	8.23	2.50
Meadows' German Kainit	....	....	12.00
Diamond Acid Phosphate	16.00	....	....
Brooks' Special Tobacco Grower	8.00	2.47	5.00
Parker's Special Tobacco Guano	8.00	2.47	4.00
Dixon's High Grade Tobacco Guano	8.00	2.47	3.00
Hookerton Cotton Guano	8.00	1.64	2.00
The Miller Fertilizer Co., Baltimore, Md.—			
Miller's 16 Per Cent Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Ground Bone .....Total	13.70	2.47	....
Corn and Peanut Grower	10.50	....	2.25
The Miller Fertilizer Co.'s 10 and 4 Per Cent.	10.00	....	4.00
Clinch	10.00	....	2.00
Trucker	8.00	4.12	5.00
No. 1 Potato and Vegetable Grower	8.00	3.71	7.00
Miller's Irish Potato	8.00	3.29	4.00
4 Per Cent Tobacco	8.00	3.29	4.00
Everett's Special Cotton Grower	8.00	3.29	4.00
Standard Phosphate	8.00	2.47	3.00
Standard Potato	8.00	2.47	3.00
Tobacco King	8.00	2.47	3.00
Harmony	8.00	2.06	3.00
Special Tobacco Grower	8.00	1.65	4.00
Potato and Vegetable Guano	8.00	1.65	4.00
Ammoniated Dissolved Bone	8.00	1.65	2.00
Profit	8.00	1.65	2.00
Farmers' Profit	8.00	1.65	2.00
Miller's 7 Per Cent	7.00	5.77	7.00
High Grade Potato	6.00	4.12	7.00
Nitrate of Soda	....	15.05	....
Ground Fish	....	8.23	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Mapes Formula and Peruvian Guano Co., 143 Liberty Street, New York.—			
Mapes' Complete Manure, "A" Brand	10.00	2.47	2.50
Mapes' Corn Manure	8.00	2.47	6.00
Mapes' Vegetable or Complete Manure for Light Soils	6.00	4.94	6.00
Mapes' Economical Potato Manure	4.00	3.29	8.00
D. B. Martin Co., Richmond, Va.—			
Pure Ground Bone.....Total	22.00	2.46	....
Raw Bone Meal.....Total	21.00	3.70	....
Animal Bone Potash Compound	16.00	1.65	2.50
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Pure Dissolved Animal Bone	12.00	1.65	2.00
Pure Dissolved Animal Bone	12.00	1.64	....
Potash and Soluble Bone	12.00	....	5.00
Potash and Soluble Bone	12.00	....	3.00
Potash and Soluble Bone	10.00	....	5.00
Potash and Soluble Bone	10.00	....	2.00
Martin's Tobacco Compound	9.00	2.26	2.00
Dissolved Organic Compound	9.00	1.00	2.00
Martin's H. G. Guano	8.75	2.00	2.00
Martin's H. G. Guano	8.75	1.65	2.00
Martin's Cotton Guano	8.00	3.28	4.00
Martin's Red Star Brand	8.00	3.28	4.00
Martin's Blue Ribbon Brand Fertilizer	8.00	3.28	2.00
Martin's Bull Head Fertilizer	8.00	2.46	3.00
Martin's Tobacco Special	8.00	2.46	3.00
Martin's Cotton Guano	8.00	2.06	....
Corn and Cereal Special	8.00	1.65	2.00
Martin's Carolina Cotton	8.00	1.64	2.00
Old Virginia Favorite	8.00	1.64	2.00
Martin's Special Potato Manure	8.00	1.00	5.00
One-Eight-Four	8.00	1.00	4.00
Martin's Peanut Grower	8.00	1.00	4.00
Gilt Edge Potato Manure	7.00	2.46	10.00
Claremount Vegetable Grower	7.00	2.46	5.00
Martin's Top Dresser	7.00	8.22	2.50
Martin's Animal Organic Compound	8.00	1.64	3.00
Martin's Animal Bone Potato Guano	6.00	4.10	7.00
Martin's 7 Per Cent Guano	6.00	5.74	5.00
Early Truck and Vegetable Grower	6.00	3.28	8.00
Martin's Top Dresser	5.00	8.22	2.50
Nitrate of Soda	....	15.58	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Marietta Fertilizer Co., Atlanta, Ga.—			
Langford's Special Guano	10.00	1.65	4.00
Lion Power Guano	10.00	1.65	2.00
Royal Seal Guano	10.00	1.65	2.00
Cooper's High Grade Guano	10.00	1.65	2.00
Lion H. G. Guano	10.00	1.65	2.00
Lion Crop Producer	10.00	....	4.00
Dissolved Bone and Potash	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Marsh-Lee & Co., Marshville, N. C.—			
Marsh's Acid	16.00	....	....
Marsh's Acid	14.00	....	....
Marsh's Special High Grade	8.00	2.47	3.00
Marsh's Cotton Fertilizer	8.00	1.65	2.00
Marsh's Guano for Corn	8.00	1.65	2.00
The MacMurphy Co., Charleston, S. C.—			
H. G. Acid Phosphate	16.00	....	....
High Grade Acid Phosphate, 14 Per Cent	14.00	....	....
Acid Phosphate	13.00	....	....
Special 9-3-3 Guano	9.00	2.47	3.00
Special Cotton and Corn 8.75 2-3	8.75	1.65	2.00
Special 8-3-3 Guano	8.00	2.47	3.00
Special 8-2-2 Cotton and Corn Guano	8.00	1.65	2.00
Special 8-4-6	8.00	3.29	6.00
Special Cotton 8-4-4	8.00	3.29	4.00
Wilcox & Gibbs Co.'s Manipulated Guano	9.00	2.26	2.00
Nitrate of Soda	....	14.82	....
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
Pure German Kainit	....	....	12.00
Martin & White Co., Norfolk, Richmond and Baltimore.—			
Phosphate and Potash	12.00	....	5.00
Phosphate and Potash	12.00	....	3.00
Phosphate and Potash	10.00	....	5.00
Phosphate and Potash	10.00	....	4.00
Phosphate and Potash	10.00	....	2.00
H. G. Cotton and Tobacco Guano	8.00	3.28	4.00
Organic Cotton Grower	8.00	2.46	3.00
Special Peanut Grower	8.00	1.05	4.00
Special Seven Per Cent Trucker	6.00	5.74	5.00
Special Potato Guano	6.00	4.10	7.00
Fish Guano	8.00	1.65	3.00
Fruit Special	8.00	1.65	2.00
Big Crop Grower	8.00	1.65	2.00
Blood, Bone and Potash	7.00	4.10	8.00
Virginia Trucker	6.00	3.38	4.00
Nitrate of Soda	....	15.48	....
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
North Carolina Cotton Oil Co., Wilmington, N. C.—			
Wilmington Mortgage Lifter	9.00	2.27	2.00
Wilmington Prolific Crop Grower	9.00	2.27	2.00
Wilmington's Pride	8.00	4.12	7.00
Wilmington Truck Grower	8.00	3.30	4.00
Wilmington High Grade	8.00	2.47	3.00
Wilmington Standard	8.00	2.47	2.50
Wilmington Tobacco Grower	8.00	2.06	3.00
Wilmington Banner	8.00	1.65	3.00
Wilmington Cotton Grower	8.00	1.65	2.00
Wilmington Special	8.00	1.65	2.00
John's Special	8.00	2.47	4.00
L. P. B. Special	8.00	2.47	3.00
Lewis' Special	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Carter's Lifter	8.00	2.47	3.00
Pate's Special	8.00	2.47	2.00
Clark's Special	8.00	1.65	3.00
Nitrate of Soda	....	14.82	....
North Carolina Cotton Oil Co., Raleigh, N. C.—			
Raleigh Standard Guano	8.00	2.26	2.00
North Carolina Cotton Oil Co., Charlotte, N. C.—			
Dixie Standard	8.00	2.48	3.00
Majestic	8.00	1.65	2.00
North Carolina Cotton Oil Co., Henderson, N. C.—			
Henderson Tobacco Fertilizer	9.00	2.47	3.00
Henderson Cotton Grower	8.00	1.65	2.00
Franklin Tobacco Fertilizer	9.00	2.47	3.00
Franklin Cotton Grower	8.00	1.65	2.00
Pride of Vance	9.00	2.47	3.00
Uneedit Tobacco Fertilizer	9.00	2.47	3.00
McKinne Mixture	8.00	2.26	3.25
Brewer's Special	8.00	2.26	2.00
Uneedit Cotton Grower	8.00	1.65	2.00
Vance Cotton Grower	8.00	1.65	2.00
Nitrate Agencies Co., New York, Baltimore, Savannah, Charleston and Norfolk.—			
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Special Corn and Peanut Grower	11.00	....	2.00
High Grade Bone and Potash	10.00	....	4.00
High Grade Fish Scrap	....	8.25	....
Carteret Bone and Potash	10.00	....	2.00
Oriole Tobacco Grower	8.00	3.30	4.00
Foy's High Grade Fertilizer	8.00	2.47	3.00
Lenoir Bright Leaf Tobacco Grower	8.00	2.47	3.00
Pitt's Prolific Golden Tobacco Guano	8.00	2.47	3.00
Favorite Cotton Grower C. S. M.	8.00	2.27	2.00
Onslow Farmers' Reliance Guano	8.00	2.06	3.00
Jones County Premium Crop Grower	8.00	2.06	3.00
Craven Cotton Guano	8.00	1.65	2.00
Greene County Standard Fertilizer	8.00	1.65	2.00
Dunn's Standard Truck Grower	7.00	5.77	7.00
Ives' Irish Potato Guano	7.00	4.12	7.00
Eureka Tobacco Fertilizer	6.00	3.30	7.00
Pamlico Electric Top Dresser	5.00	8.25	2.50
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.67	....
Dried Blood	....	13.25	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Norfolk Fertilizer Co., Norfolk, Va.—			
Oriana 16 Per Cent Acid Phosphate	16.00	....	....
Oriana 14 Per Cent Acid Phosphate	14.00	....	....
Oriana Wheat Grower	10.00	....	4.00
Oriana Bone and Potash	10.00	....	2.00
Oriana C. S. M. Special	9.00	2.26	2.00
Oriana First Step Tobacco Guano	8.00	3.29	4.00
Oriana Tobacco Guano	8.00	2.47	3.00
Oriana for Cotton	8.00	2.47	3.00
Oriana Cotton Guano	8.00	1.65	2.00
Oriana Crop Grower	8.00	1.65	2.00
Oriana H. G. Tobacco Guano	6.00	3.29	4.00
Whitney High Grade Acid Phosphate	16.00	....	....
Iola Acid Phosphate	13.00	....	....
Shenandoah Wheat Mixture	10.00	....	3.00
Young's Grain Grower	10.00	....	2.00
Mayodan Valley Wheat Grower	8.00	....	4.00
Pine Top Special Crop Grower	5.00	1.65	6.00
Nitrate of Soda Mixture for Top Dressing Cotton	2.00	8.23	....
Genuine German Kainit	....	....	12.00
Navassa Guano Co., Wilmington, N. C.—			
Navassa Acid Phosphate	16.00	....	....
Navassa 14 Per Cent Acid Phosphate	14.00	....	....
Navassa Dissolved Bone	13.00	....	....
Navassa Acid Phosphate	12.00	....	....
Navassa Special Wheat Mixture	12.00	....	4.00
Navassa Gray Land Mixture	12.00	....	4.00
Navassa Wheat Mixture	10.00	....	2.25
Navassa Wheat and Grass Grower	10.00	....	4.00
Navassa Dissolved Bone with Potash	10.00	....	2.00
Navassa Fish Guano	9.00	2.47	3.00
Navassa Manipulated Guano	9.00	2.26	2.00
Navassa Complete Fertilizer	9.00	1.65	1.00
Navassa Universal Fertilizer	8.50	2.06	1.00
Navassa Special Trucker Guano	8.00	3.30	4.00
Navassa High Grade Tobacco Guano	8.00	2.47	10.00
Navassa Carib Guano	8.00	2.47	10.00
Navassa Blood and Meal Mixture	8.00	2.47	5.00
Navassa High Grade Guano	8.00	2.47	3.00
Navassa Cotton Seed Meal Special 3 Per Cent Guano	8.00	2.47	2.00
Navassa Strawberry Top Dressing	8.00	2.06	4.00
Navassa Guano for Tobacco	8.00	2.06	2.00
Navassa Fruit Growers' Fertilizer	8.00	1.65	6.00
Navassa Dissolved Bone with Potash	8.00	....	4.00
Navassa Grain Fertilizer	8.00	1.65	2.00
Navassa Cotton Seed Meal Guano	8.00	1.65	2.00
Navassa Cotton Fertilizer	8.00	1.65	2.00
Navassa Root Crop Fertilizer	7.00	4.12	7.00
Navassa Creole Guano	6.00	4.12	7.00
Maxim Guano	10.00	2.47	2.00
Corona Guano	10.00	1.65	2.00
Osceola Guano	9.00	1.65	3.00
Harvest Queen Fertilizer	9.00	1.65	2.00
Coree Tobacco Guano	8.00	3.29	4.00
Orton Guano	8.00	2.47	4.00
Clarendon Tobacco Guano	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Mogul Guano	8.00	2.06	3.00
Ammoniated Soluble Navassa Guano	8.00	2.06	2.00
Harvest King Guano	8.00	1.65	3.00
Clark's Special Cotton-seed Meal Guano	8.00	1.65	3.00
Occoneechee Tobacco Guano	8.00	1.65	2.00
Sulphate of Ammonia	....	20.59	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.82	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
The Nitrate Agencies Co., Savannah, Ga.—			
Nitrate of Soda, 95 Per Cent	....	15.65	....
The Nitrate Agencies Co., Norfolk, Va.—			
Nitrate of Soda	....	14.85	....
Ocean Fisheries Co., Wilmington, N. C.—			
Fish Scrap	3.40	5.30	....
G. Ober & Sons Co., Baltimore, Md.—			
Pure Raw Bone Meal.....Total	21.00	3.71	....
Ober's High Grade Acid Phosphate	16.00	....	....
Ober's Dissolved Bone Phosphate	14.00	....	....
Ober's Standard Potash Compound	12.00	....	5.00
Ober's Dissolved Animal Bone	10.00	2.47	....
Ober's Dissolved Bone, Phosphate and Potash,	10.00	....	2.00
Ober's Special High Grade Fertilizer	9.00	2.47	3.00
Ober's Special Ammoniated Dissolved Bone	9.00	1.65	2.00
Ober's Farmers' Mixture	9.00	.82	2.00
Ober's H. G. Fertilizer	8.00	3.30	4.00
Ober's Special Compound for Tobacco	8.00	2.47	3.00
Ober's Standard Tobacco Fertilizer	8.00	1.65	2.00
Ober's Special Cotton Compound	8.00	1.65	2.00
Ober's Soluble Ammoniated Superphosphate of Lime	8.00	1.65	2.00
Ober's Stag Guano	8.00	.82	4.00
Ober's Acid Phosphate with Potash	8.00	....	4.00
Ober's Complete Fertilizer	6.00	4.12	6.00
Ober's Special Potash Compound for Tobacco,	6.00	2.47	7.00
Ober's Special Tobacco Bed Fertilizer 10 Per Cent	4.00	8.25	3.00
Acid Phosphate with Potash	10.00	....	4.00
Cooper's Pungo Guano	8.00	2.06	2.00
Nitrate of Soda	....	15.50	....
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
The Pocomoke Guano Co., Norfolk, Va.—			
Pure Ground Bone.....Total	20.00	3.70	....
Superb Acid Phosphate	16.00	....	....
Peerless Acid Phosphate	14.00	....	....
Alkali Bone	11.00	....	2.00
Pocomoke Bone and Potash Mixture	10.00	....	4.00
Pocomoke Superphosphate	8.50	1.65	2.00
Pocomoke Wheat, Corn and Peanut Manure	8.00	1.00	4.00
Pocomoke Defiance Bone and Potash	8.00	....	4.00
10-2 Potash Mixture	10.00	....	2.00
Monticello Animal Bone Fertilizer	9.00	1.85	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Cinco Tobacco Guano	8.50	2.06	2.50
Electric Crop Grower	8.50	1.65	2.00
Garrett's Grape Grower	8.00	3.29	10.00
Harvey's High Grade Monarch	8.00	2.47	3.00
Monarch Tobacco Grower	8.00	2.47	3.00
C. C. C. (Crescent Complete Compound)	8.00	1.65	3.00
Pamlico Superphosphate	8.00	1.65	2.00
Standard Truck Guano	7.00	4.11	5.00
Faultless Ammoniated Superphosphate	7.00	3.29	4.00
Freeman's 7 Per Cent Irish Potato Grower	6.00	5.76	5.00
Seaboard Popular Trucker	6.00	5.76	5.00
Coast Line Truck Guano	5.00	8.23	3.00
Smith's Special Formula	4.00	3.29	6.00
Nitrate of Soda	....	15.00	....
Ground Fish	....	8.23	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Pamlico Chemical Co., Washington, N. C.—			
Pamlico 16 Per Cent Acid Phosphate	16.00	....	....
Pamlico Bone Phosphate	14.00	....	....
Pamlico 8-4-4 Guano	8.00	3.30	4.00
Pamlico High Grade Tobacco Grower	8.00	2.47	5.00
Pamlico Success Guano	8.00	2.47	3.00
Pamlico Bone and Fish Guano	8.00	1.65	2.00
Pamlico Cotton Guano	8.00	1.65	2.00
Pamlico 7-7-7 Guano	7.00	5.77	7.00
Pamlico Special Irish Potato Guano	7.00	4.12	7.00
Pamlico Special Sweet Potato Guano	7.00	4.12	5.00
Pamlico 6-3-6	6.00	2.47	6.00
Pamlico Cereal Side Dresser	2.50	7.42	2.50
Pamlico Ground Fish	....	8.25	....
Dissolved Bone and Potash Compound	10.00	....	2.00
Blount's Special Cotton Grower	9.00	2.27	2.00
Blount's Special Tobacco Grower	8.00	2.47	3.00
Blount's H. G. Potato Grower	7.00	4.12	5.00
Prosperity Cotton Grower	9.00	2.26	2.00
Cowell's Great Potato Grower	8.00	4.12	7.00
Bull's Eye Tobacco Grower	8.00	3.30	4.00
Tobacco Growers' Friend	8.00	2.47	3.00
Staton, Taylor & Mayo's Special Cotton Grower	8.00	2.26	2.00
Farmers' Best Guano	8.00	2.06	3.00
Falkland H. G. Tobacco Guano	6.00	2.47	6.00
Cowell's Great Cabbage Grower	5.00	8.25	2.50
Acidulated Fish Scrap	5.50	7.82	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Planters Fertilizer and Phosphate Co., Charleston, S. C.—			
Planters' High Grade Acid Phosphate	14.00	....	....
Planters' H. G. Tobacco Fertilizer	8.00	2.47	3.00
Planters' H. G. Top Dresser	4.00	6.18	2.50
Planters' Soluble Bone	13.00	....	....
Planters' Soluble Guano	8.00	2.47	3.00
Planters' Bone and Potash	12.00	....	1.00
Planters' Bone and Potash	10.00	....	2.00
Planters' Bone and Potash	8.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Planters' Special Meal Mixture	10.00	1.65	2.00
Planters' Special Mixture	9.00	.82	3.00
Planters' Special Mixture	8.00	4.12	5.00
Planters' Special Cotton Fertilizer	8.00	3.29	4.00
Planters' Grain Grower	10.00	.82	3.00
Planters' Acid and Potash	10.00	....	4.00
Planters' Blood, Bone and Fish Guano	9.00	1.65	3.00
Planters' Bright Tobacco Fertilizer	8.00	3.29	4.00
Planters' Cotton and Corn Fertilizer	8.00	2.47	4.00
Planters' Fertilizer	8.00	2.06	2.00
Planters' Standard Fertilizer	8.00	1.65	2.00
Planters' Muriate of Potash	....	....	48.00
Planters' German Kainit	....	....	12.00
Excelsior H. G. Acid Phosphate	14.00	....	....
Special Mixture	8.00	3.29	6.00
Nitrate of Soda	....	14.83	....
Sulphate of Potash	....	....	48.00
Peruvian Guano Corporation, Charleston, S. C.—			
Peruvian Guano, Ex. S.S. Celia.....Total	18.00	2.88	3.25
Peruvian Guano, Ex. S.S. Chipana.....Total	12.00	4.58	2.50
Peruvian Guano S.S. Chipana.....Total	12.00	2.88	2.00
Peruvian Guano Ex. S.S. Chipana.....Total	12.00	2.88	2.00
Peruvian Guano, Ex. S.S. Chipana.....Total	11.50	5.96	2.75
Peruvian Guano, Ex. S.S. Chipana.....Total	11.00	5.76	2.50
Peruvian Top Dresser.....Total	8.00	7.00	3.50
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
13 Per Cent Acid Phosphate	13.00	....	....
12 Per Cent Acid Phosphate	12.00	....	....
S. S. Chipana.....Total	14.00	3.29	2.00
S. S. Condon.....Total	14.00	2.46	2.00
S. S. Capac.....Total	13.00	4.93	2.25
Sulphate of Ammonia	....	20.56	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.80	....
Dried Blood	....	13.16	....
Fish Scrap	....	8.22	....
Muriate of Potash	....	....	49.00
Kainit	....	....	12.00
Pearsall & Co., Wilmington, N. C.—			
H. G. Acid Phosphate	16.00	....	....
H. G. Acid Phosphate	14.00	....	....
High Grade Tobacco	8.00	2.47	3.00
Pearsall's Bone and Potash	10.00	....	4.00
Pearsall's Berry Guano	8.00	2.47	10.00
Pearsall's Potato and Truck Guano	6.00	4.12	7.00
Pearsall's Top Dresser	....	7.42	3.00
Fish and Potash Compound	8.00	3.29	4.00
Bone Meal and Fish.....Total	8.00	3.29	4.00
F. F. F. G.	8.00	2.47	3.00
Corn Guano	8.00	1.65	3.00
Eagle	8.00	1.65	2.00
Fernside	6.00	4.12	7.00
Nitrate of Soda	....	14.25	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Pacific Guano Co., Charleston, S. C.—			
Standard Pacific Acid Phosphate	12.00	....	....
Standard Soluble Pacific Guano	8.50	1.65	2.00
High Grade Pacific Fertilizer	8.00	2.46	3.00
Powhatan Chemical Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	20.00	3.29	....
Magic Dissolved Bone Phosphate	16.00	....	....
Magic Corn Grower	10.00	.82	1.00
Magic Crop Grower	10.00	.82	1.00
Magic Bone and Potash Mixture	10.00	....	4.00
Magic Mixture	9.00	1.65	1.00
Magic Wheat Grower	9.00	.82	2.00
Magic Fertilizer	8.00	2.47	4.00
Magic Cotton Grower	8.00	1.65	2.00
Magic Special Fertilizer	8.00	1.65	2.00
Magic Tobacco Grower	8.00	1.65	2.00
Magic Peanut Special	8.00	.82	4.00
Magic Peanut Grower	8.00	....	4.00
Magic Grain and Grass Grower	8.00	....	4.00
High Grade Acid Phosphate	14.00	....	....
High Grade Bone and Potash Mixture	12.00	....	5.00
Powhatan Acid Phosphate	13.00	....	....
Powhatan Special Fertilizer	9.00	1.65	2.00
Powhatan Bone and Potash Mixture	8.00	....	4.00
Powhatan Trucker	7.00	4.94	5.00
Virginia Dissolved Bone	12.00	....	....
Bone and Potash Mixture	10.00	....	2.00
Guilford Special Tobacco Fertilizer	9.00	2.47	6.00
Economic Cotton Grower	9.00	2.26	2.00
Johnson's Best Fertilizer	9.00	2.06	5.00
Johnson's Special Fertilizer	8.00	2.47	3.00
Holt's Magic Fertilizer	9.00	2.06	5.00
King Trucker	8.00	4.11	5.00
King Brand Fertilizer	8.00	2.06	3.00
North State Special	8.00	3.29	4.00
P. C. Co.'s Hustler	8.00	2.47	3.00
White Leaf Tobacco Fertilizer	8.00	2.06	3.00
Sulphate of Ammonia	....	19.75	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Pure German Kainit	....	....	12.00
Pine Level Oil Mill Co., Pine Level, N. C.—			
Pine Level 14 Per Cent Acid Phosphate	14.00	....	....
Pine Level High Grade	8.00	2.47	3.00
Sutton's Potato Guano	9.00	2.88	5.00
Oliver's Truck Grower Guano	8.00	3.30	4.00
Hale's Special for Tobacco	8.00	2.47	4.00
Cotton Grower for All Crops	8.00	1.65	2.00
H. G. Top Dresser	3.00	6.03	6.00
Nitrate of Soda	....	15.22	....
Muriate Potash	....	....	48.00
Patapsco Guano Co., Baltimore, Md.—			
Patapsco Pure Ground Bone.....Total	20.59	3.70	....
Patapsco Pure Dissolved S. C. Phosphate	14.00	....	....
Patapsco High Grade Phosphate and Potash,	11.00	....	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Patapsco 10 and 4 Potash Mixture	10.00	....	4.00
Patapsco Soluble Bone and Potash	10.00	....	2.00
Patapsco Guano for Tobacco	9.25	2.06	2.00
Patapsco Guano	9.25	2.06	2.00
Patapsco Tobacco Fertilizer	9.00	2.47	3.00
Patapsco Cotton and Tobacco Special	8.00	3.29	4.00
Patapsco Plant Food for Tobacco, Potatoes and Truck	8.00	2.47	5.00
Patapsco Special Tobacco Mixture	8.00	2.06	3.00
Patapsco 7-7-7 Truck Guano	7.00	5.76	7.00
Patapsco Trucker for Early Vegetables	7.00	4.11	5.00
Patapsco Potato Guano	6.00	4.11	7.00
Patapsco Crop Dresser	4.00	3.30	4.00
Patapsco Crop Dresser	4.00	3.29	4.00
Sulphate of Ammonia	....	19.75	....
Florida Soluble Phosphate	16.00	....	....
Baltimore Soluble Phosphate	11.00	....	2.00
Coon Brand Guano	9.00	.82	3.00
Choctaw Guano	8.00	2.47	3.00
Unicorn Guano	8.00	2.06	3.00
Swanson's Gold Leaf Special	8.00	2.06	2.00
Planters' Favorite	8.00	1.65	2.00
Seagull Ammoniated Guano	8.00	1.65	2.00
Grange Mixture	8.00	1.65	2.00
Money Maker Guano	7.00	3.70	6.00
Nitrate of Soda	....	15.00	....
Ground Fish	....	8.23	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Pocahontas Guano Co., Lynchburg, Va.—			
Fine Ground Bone Meal.....Total	23.00	2.47	....
Pure Raw Bone Meal.....Total	22.00	3.71	....
Carrington's S. C. Phosphate, Waukesha Brand	16.00	....	....
Imperial Dissolved S. C. Phosphate	14.00	....	....
Wabash Wheat Mixture	10.00	....	4.00
Carrington's Superior Grain Compound	10.00	....	2.00
Pocahontas Special Tobacco Fertilizer	9.00	2.47	3.00
High Grade 4 Per Cent Tobacco Compound, Mohawk King	9.00	1.85	4.00
Yellow Tobacco Special	9.00	1.65	2.00
Standard Tobacco Guano, Old Chief Brand	9.00	1.65	2.00
Indian Tobacco Grower	8.00	2.47	4.00
Farmers' Favorite Apex Brand	8.00	2.47	3.00
Special Truck Grower, Eagle Mount Brand	8.00	2.06	6.00
Spot Cash Tobacco Compound	8.00	2.06	3.00
Carrington's Banner Brand Guano	8.00	1.65	2.00
A. A. Complete Champion Brand	8.00	1.03	3.00
Cherokee Grain Special	8.00	....	4.00
Planters Cotton Seed Oil Co., Rocky Mount, N. C.—			
Royal Cotton Grower	9.00	2.20	2.00
Tar River Special	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Tobacco Guano	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Cotton Guano	8.00	1.65	2.00
Planters' C. S. Oil Co.'s Cotton Guano	8.00	1.65	2.00
Eagle Guano	8.00	1.65	2.00
Braswell's Special for Tobacco	7.00	2.26	3.50
E. L. D. Special	6.50	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Piedmont-Mt. Airy Guano Co., Baltimore, Md.—			
Piedmont Bone Meal.....Total	21.00	3.29	....
Piedmont Bone and Peruvian Mixture.....	8.00	1.65	2.00
Piedmont High Grade S. C. Bone Phosphate..	14.00	....	....
Piedmont High Grade Ammoniated Bone and Potash	8.00	2.47	3.00
Piedmont High Grade Guano for Cotton.....	8.00	2.47	3.00
Piedmont Special Potash Mixture.....	10.00	....	5.00
Piedmont Special Farmers' Tobacco Guano..	8.40	2.47	4.00
Piedmont Special for Cotton, Corn and Peanuts	8.00	1.65	2.00
Piedmont Special Truck.....	6.00	5.76	5.00
Piedmont Special Potato Guano.....	6.00	4.94	7.00
Piedmont Farmers' Bone and Potash.....	10.00	....	2.00
Piedmont Farmers' Standard.....	9.00	1.65	2.00
Piedmont Farmers' Cotton Grower.....	9.00	.82	3.00
Piedmont Farmers' Favorite.....	8.00	.82	4.00
Piedmont Essential Tobacco Compound.....	9.00	1.65	2.00
Piedmont Raw and Dissolved Bone Compound.	9.00	1.00	2.00
Piedmont Unexcelled Guano.....	8.00	3.29	4.00
Piedmont Guano for Tobacco.....	8.00	2.06	3.00
Piedmont Guano for All Crops.....	8.00	2.06	3.00
Piedmont Red Leaf Tobacco Guano.....	8.00	1.65	2.00
Piedmont Cultivator Brand.....	8.00	1.65	2.00
Piedmont Guano for Wheat.....	8.00	1.65	....
Piedmont Star Bone and Potash.....	8.00	....	5.00
Piedmont's 7-7-7 Truck Guano.....	7.00	5.76	7.00
Piedmont 5-7-5 Guano.....	7.00	4.12	5.00
Piedmont Early Vegetable Manure.....	6.00	4.12	7.00
Piedmont Early Trucker.....	6.00	4.12	5.00
Piedmont Vegetable Compound.....	6.00	3.29	8.00
Piedmont Potato Producer.....	5.00	2.47	6.00
Levering's Potashed Bone.....	10.00	....	4.00
Levering's Ammoniated Bone.....	9.00	.82	3.00
Levering's Reliable Tobacco Guano.....	8.00	2.47	3.00
Levering's Standard	8.00	1.65	3.00
Stowe Brothers' Select.....	8.00	3.29	4.00
Salsbury's H. G. Ammoniated Guano.....	8.00	2.47	3.00
Salsbury's Special for Cotton, Corn and Peanuts	8.00	1.65	2.00
Hunter & Dunn's Special Guano.....	8.00	2.47	3.00
Hunter & Dunn's Ammoniated Fertilizer....	8.00	1.65	2.00
Bailey's Buck Brand.....	8.00	1.65	2.00
Haynes' Cultivator Brand Guano.....	8.00	1.65	2.00
Sulphate of Ammonia.....	....	20.58	....
Sulphate of Potash.....	....	....	50.00
Nitrate of Soda.....	....	15.23	....
Boykin's Top Dresser.....	....	7.41	3.00
Muriate of Potash.....	....	....	48.00
The Quinnepiac Co., Charleston, S. C.—			
Standard Quinnepiac Acid Phosphate.....	13.00	....	....
Standard Quinnepiac Pine Island Ammoniated Superphosphate	9.00	1.85	1.00
The Robertson Fertilizer Co., Norfolk, Va.—			
Robertson's Raw Bone Meal.....Total	20.00	3.71	....
Robertson's Soluble H. G. Guano.....	8.00	2.47	4.00
Robertson's X-(T) Tobacco Grower.....	8.00	2.06	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Robertson's 5-6-7	6.00	4.13	7.00
Robertson's 7 Per Cent for Truck	5.00	5.78	5.00
Robertson's 10 Per Cent Truck Guano	2.00	8.25	2.00
High Peak Acid Phosphate	16.00	....	....
Scepter Brand Acid Phosphate	14.00	....	....
J. W. S. Special Bone and Potash Mixture	12.00	....	5.00
J. W. S. Alkaline Bone	10.00	....	5.00
Skyscraper Bone and Potash Compound	10.00	....	4.00
Level Run Dissolved Bone and Potash	10.00	....	2.00
Dodson's Choice H. G. Complete Manure	9.00	2.47	3.00
Beaver Brand Soluble Guano	9.00	1.85	4.00
Beaver Brand Soluble Tobacco Guano	9.00	1.85	4.00
Beaver Brand Bright Tobacco Special	9.00	1.85	4.00
P. M. C. High Grade Soluble Guano	8.00	4.12	7.00
Wood's Winner H. G. Guano	8.00	3.30	4.00
Big Cropper High Grade Guano	8.00	2.47	3.00
Double Dollar Soluble Guano	8.00	1.65	2.00
Double Dollar Soluble Cotton Grower	8.00	1.65	2.00
Double Dollar Soluble Tobacco Guano	8.00	1.65	2.00
Ten Strike Soluble Crop Producer	8.00	1.00	4.00
M. C. Special Bone and Potash Mixture	8.00	....	4.00
Nitrate of Soda	....	14.85	....
Dried Blood	....	13.20	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
F. S. Royster Guano Co., Norfolk, Va.—			
Pure Raw Bone Meal.....Total	21.50	3.71	....
Royster's H. G. 17 Per Cent Acid Phosphate	17.00	....	....
Royster's H. G. 16 Per Cent Acid Phosphate	16.00	....	....
Royster's 14 Per Cent Acid Phosphate	14.00	....	....
Royster's Dissolved Bone	13.00	....	....
Royster's XX Acid Phosphate	12.00	....	....
Royster's Bone and Potash Mixture	11.00	....	5.00
Royster's Bone and Potash for Grain	10.00	....	3.00
Royster's Bone and Potash Mixture	10.00	....	2.00
Royster's Soluble Guano	10.00	1.65	2.00
Royster's 10-5 Bone and Potash Mixture	10.00	....	5.00
Royster's 10 and 4 Bone and Potash Mixture,	10.00	....	4.00
Royster's 4-9-5 Special	9.00	3.30	5.00
Royster's Meal Mixture	9.00	2.26	2.00
Royster's Cotton Grower	9.00	2.26	2.00
Royster's Special 1-9-2 Guano	9.00	.82	2.00
Royster's Special 4-8-3	8.00	3.30	3.00
Royster's Special Sweet Potato Guano	8.00	2.47	3.00
Royster's Special Wheat Fertilizer	8.00	1.65	2.00
Royster's Special 7 Per Cent Truck Guano	7.00	5.77	7.00
Royster's Special 10 Per Cent Truck Guano	5.00	8.24	3.00
Royster's Best Guano	8.00	3.71	7.00
Royster's Complete Guano	8.00	1.65	2.00
Royster's 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Royster's Early Truck Guano	7.00	4.12	8.00
Royster's Peanut Special	7.00	....	5.00
Royster's Irish Potato Guano	6.00	4.12	7.00
Royster's Irish Potato Guano	6.00	4.12	7.00
Royster's 2-6-5 Special	6.00	1.65	5.00
Royster's Cabbage Guano	5.00	8.23	2.50
Royster's Potato Guano	5.00	4.94	7.00
Royster's 4-6-4 Special	4.00	4.94	4.00
Tomlinson's Special	9.00	2.47	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Watkins' Special	9.00	2.06	5.00
Haynes' Special	9.00	2.06	3.00
Viking Ammoniated Guano	9.00	1.65	3.00
Special Compound	9.00	1.65	1.00
Cobb's High Grade for Tobacco	8.00	3.30	5.00
Trucker's Delight	8.00	3.30	4.00
Milo Tobacco Guano	8.00	3.30	4.00
Jupiter High Grade Guano	8.00	3.30	4.00
Black Wrapper Special Tobacco Guano	8.00	3.30	2.00
Eagle's Special Tobacco Guano	8.00	2.47	5.00
Bonanza Tobacco Guano	8.00	2.47	3.00
Marlborough High Grade Cotton Guano	8.00	2.47	3.00
Williams' Special Guano	8.00	2.06	5.00
Orinoco Tobacco Guano	8.00	2.06	3.00
Special Tobacco Compound	8.00	2.06	2.00
Corbett & Moore's Special	8.00	1.65	3.50
Farmers' Bone Fertilizer	8.00	1.65	2.00
Webb's Korn King	8.00	1.65	2.00
Farmers' Bone Fertilizer for Tobacco	8.00	1.65	2.00
Jumbo Peanut Grower	8.00	1.02	4.00
Royal Special Potato Guano	7.00	4.12	7.00
Royal Potato Guano	7.00	4.12	5.00
Ballentine's Potato Guano	6.00	5.77	7.00
Arrow Potato Guano	6.00	5.77	5.00
Oakley's Special Tobacco Guano	6.00	3.30	4.00
McDowell's Cotton Grower	6.00	3.30	2.00
Humphrey's Special for Tobacco	6.00	2.55	3.20
Wiggins' Special	5.50	3.30	3.00
Harvey's Cabbage Guano	5.00	6.59	3.00
Phillips' Special	5.00	1.65	6.00
Dry Fish .....Total	3.50	8.64	....
Nitrate of Soda	....	15.22	....
Magic Top Dresser	....	7.42	3.00
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Roice Brothers & Sons Co., Inc., Hampton, Va.—			
Crab Scrap .....Total	3.25	5.33	....
J. H. Roberson & Co., Robersonville, N. C.—			
Roberson's Cotton Grower	9.00	2.26	2.00
Roberson's Special for Bright Tobacco	8.00	2.06	3.00
Roberson's Special Potato Grower	7.00	5.77	7.00
Roberson's Potato Guano	6.00	5.77	5.00
Richmond Guano Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	20.00	3.29	....
Rex Dissolved Bone Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
High Grade Wheat and Grass Fertilizer	14.00	....	....
Premium Bone and Potash Mixture	13.00	....	3.00
Premium Dissolved Bone	13.00	....	....
Premium Corn Grower	10.00	.82	1.00
Premium Cotton Grower	9.00	.82	3.00
Premium Wheat Grower	9.00	.82	2.00
Premium Tobacco Fertilizer	8.00	1.65	2.00
Premium Brand Fertilizer	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Premium Peanut Special	8.00	.82	4.00
Premium Peanut Grower	8.00	....	4.00
Hunter & Dunn's Dissolved Bone	13.00	....	....
Hunter & Dunn's Special Ammoniated Fertilizer	9.00	2.47	2.25
Hunter & Dunn's Ammoniated Fertilizer	8.00	1.65	2.00
H. G. Bone and Potash Mixture	12.00	....	5.00
Old Homestead Dissolved Bone	12.00	....	....
Dissolved S. C. Phosphate	12.00	....	....
Bone Mixture	10.00	.82	1.00
Rex Bone and Potash Mixture	10.00	....	4.00
Bone and Potash Mixture	10.00	....	2.00
Bone Mixture	9.00	1.65	1.00
Sanders' Special Formula for Bright Tobacco,	9.00	2.88	5.00
Rollings' Special Fertilizer	9.00	2.47	2.00
Collins' Special Fertilizer	9.00	2.47	2.00
Carolina Cotton Grower	9.00	2.26	2.00
Burton's Special Tobacco Fertilizer	9.00	2.06	3.00
Lowery's Special Fertilizer	9.00	1.65	3.00
Cracker Jack Fertilizer	9.00	1.65	2.00
Southern Trucker	8.00	4.11	5.00
Perfection Special	8.00	3.29	4.00
Carolina Bright Tobacco Fertilizer	8.00	2.47	3.00
Gilt Edge Fertilizer	8.00	2.47	3.00
Carolina Bright Special Tobacco Fertilizer	8.00	2.26	2.50
Tip Top Fertilizer	8.00	2.06	3.00
Carolina Bright for Cotton	8.00	2.06	1.50
Special Premium Brand for Tobacco	8.00	1.85	2.25
Special Premium Brand for Plants	8.00	1.85	2.25
Special High Grade for Truck	7.00	4.94	5.00
Benson's Favorite Fertilizer	8.00	1.65	10.00
Beeson's Special Fertilizer	8.00	1.65	6.00
Rex Tobacco Fertilizer	8.00	1.65	4.00
Parker & Hunt's Special Tobacco Fertilizer	8.00	1.65	2.00
Parker & Hunt's Special Fertilizer	8.00	1.65	2.00
Parker & Hunt's Corn Fertilizer	8.00	.82	3.00
Edgecombe Cotton Grower	8.00	1.65	2.00
Tip Top Bone and Potash Mixture	8.00	....	4.00
Winter Grain and Grass Grower	8.00	....	4.00
Clark's Special Formula	7.00	4.94	6.00
10 Per Cent Cabbage Guano	6.00	8.23	2.00
Carter's Special for Tobacco	4.00	2.47	6.00
Smith's Special Fertilizer	4.00	1.65	7.00
Sulphate of Ammonia	....	19.75	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Pure German Kainit	....	....	12.00
Red Cross Guano Co., Lynchburg, Va.—			
Red Cross Bone Meal.....Total	22.00	3.00	....
Red Cross Bone and Potash	10.00	....	2.00
Red Cross Standard Phosphate	14.00	....	....
Red Cross H. G. Phosphate	16.00	....	....
Red Cross Grain Grower	10.00	....	4.00
Red Cross for Tobacco and Truck	9.00	1.85	4.00
Red Cross for Bright Tobacco	9.00	1.65	2.00
Red Cross Special for Tobacco	8.00	2.47	3.00
Red Cross Tobacco Guano	8.00	2.06	3.00
Red Cross Crop Grower	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Raisin-Monumental Co., Baltimore, Md.—			
Raisin 16 Per Cent Acid Phosphate	16.00	....	....
Raisin 14 Per Cent Acid Phosphate	14.00	....	....
Raisin 13 Per Cent Acid Phosphate	13.00	....	....
Raisin Special Bone and Potash	10.00	....	5.00
Raisin's 10-4 Bone and Potash	10.00	....	4.00
Raisin Bone and Potash	10.00	....	2.00
Raisin Dixie Guano	9.00	1.65	2.00
Raisin Gold Standard	8.00	2.47	3.00
Raisin's Indian Brand for Tobacco	8.00	2.47	3.00
Raisin Empire Guano	8.00	1.65	2.00
Baltimore Special Mixture	9.00	.82	2.00
Read Phosphate Co., Charleston, S. C.—			
Read's H. G. Dissolved Bone	16.00	....	....
Read's H. G. Acid Phosphate	14.00	....	....
Read's H. G. Guano	8.00	3.30	4.00
Read's H. G. Tobacco Leaf	8.00	2.47	3.00
Read's H. G. Cotton Grower	8.00	2.47	3.00
Read's Bone and Potash	10.00	....	4.00
Read's Alkaline Bone	10.00	....	2.00
Read's Manipulated Guano	9.00	1.65	3.00
Read's Ammoniated Dissolved Bone	8.00	3.30	6.00
Read's Soluble Fish Guano	8.00	1.65	2.00
Read's Blood and Bone Fertilizer	8.00	1.62	2.00
Read's Special Potash Mixture	8.00	....	4.00
German Kainit	....	....	12.00
Reidsville Fertilizer Co., Reidsville, N. C.—			
Reidsville Acid Phosphate	16.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
Bone and Potash	8.00	....	4.00
Lion Brand Fertilizer	9.00	2.47	6.00
Reidsville Hustler	9.00	.82	2.00
Royal Fertilizer	8.00	2.47	3.00
Climax Fertilizer	8.00	2.06	3.00
Broad Leaf Tobacco Guano	8.00	1.85	2.50
Banner Fertilizer	8.00	1.65	2.00
Champion Guano	8.00	1.65	2.00
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Swift Fertilizer Works, Atlanta, Ga., and Wilmington, N. C.—			
Swift's Pure Bone Meal.....Total	25.00	2.47	....
Swift's Pure Raw Bone Meal.....Total	23.00	3.71	....
Swift's Pure Nitrate of Soda	....	14.82	....
Swift's Special High Grade Acid Phosphate	16.00	....	....
Swift's Special High Grade Phosphate and Potash	12.00	....	6.00
Swift's Special High Grade Guano	9.50	4.12	3.00
Swift's Special Blood Guano for Cotton or Tobacco, H. G.	8.00	2.06	3.00
Swift's Special Peanut Grower Standard Grade Guano	8.00	.82	4.00
Swift's Special Trucker H. G.	6.00	5.76	5.00
Swift's Special Potato Grower H. G. Guano	6.00	4.12	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Cultivator High Grade Acid Phosphate,	14.00	....	....
Swift's Harrow Standard Grade Acid Phosphate	13.00	....	....
Swift's Atlanta High Grade Phosphate and Potash	12.00	....	4.00
Swift's Chattahoochee Standard Grade Acid Phosphate	12.00	....	....
Swift's Farmers' Home High Grade Phosphate and Potash	10.00	....	4.00
Swift's Corn and Cotton Grower H. G. Guano,	10.00	2.47	3.00
Swift's Eagle High Grade Guano	10.00	1.65	2.00
Swift's Plow Boy Guano	10.00	.82	1.00
Swift's Field and Farm Standard Grade Phosphate and Potash	10.00	....	2.00
Swift's Wheat Grower Standard Grade Phosphate and Potash	10.00	....	2.00
Swift's Blood, Bone and Potash High Grade Guano	9.50	3.29	7.00
Swift's Cotton King High Grade Guano	9.00	2.47	2.00
Swift's Cotton Plant Standard Grade Guano	9.00	1.65	1.00
Swift's Farmers' Favorite High Grade Guano,	9.00	1.65	3.00
Swift's Cape Fear Truck Guano, H. G.	8.00	4.12	2.00
Swift's Monarch H. G. Guano Vegetable Grower	8.00	3.29	4.00
Swift's Strawberry Grower H. G. Guano	8.00	2.47	10.00
Swift's Carolina Tobacco Grower H. G. Guano,	8.00	2.47	3.00
Swift's Ruralist High Grade Guano	8.00	2.47	3.00
Swift's Pioneer High Grade Guano Tobacco Grower	8.00	1.65	4.00
Swift's Red Steer Standard Grade Guano	8.00	1.65	2.00
Swift's Golden Harvest Standard Grade Guano,	8.00	1.65	2.00
Swift's Plantation Standard Grade Phosphate and Potash	8.00	....	4.00
Swift's Carolina 7 Per Cent Special Trucker H. G. Guano	7.00	5.76	7.00
Swift's Special Irish Potato Grower H. G. Guano	7.00	4.12	8.00
Swift's Early Trucker H. G. Guano	7.00	4.12	5.00
High Grade Swift's No. 1 Ground Tankage	6.00	8.24	....
Swift's Favorite Truck Guano H. G.	6.00	4.94	6.00
Swift's Special 10 Per Cent Blood and Bone Trucker H. G. Guano	5.00	8.23	3.00
Swift's Ground Dried Blood	....	13.18	....
Swift's Muriate of Potash	....	....	50.00
Swift's German Kainit	....	....	12.00
Southern Chemical Co., Inc., Roanoke, Va.—			
Southern Queen	8.00	2.47	10.00
Success	8.00	2.47	3.00
Valley Queen	8.00	1.65	10.00
Farmers' Joy	8.00	1.65	4.00
Our Favorite	8.00	1.65	2.00
Spartanburg Fertilizer Co., Spartanburg, S. C.—			
Tiger Brand Acidulated Phosphate	14.00	....	....
West's Potash Acid	13.00	....	3.00
Gosnell's Plant Food	10.50	2.46	2.00
Corn Formula	10.50	1.65	5.00
N. C. Special	10.50	1.65	8.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Dana's Best	10.00	....	4.00
Melrose	10.00	....	2.00
Boll Buster	9.00	1.65	2.00
Cotton Compound	8.75	1.65	2.00
Glencoe	8.00	2.46	3.00
Glencoe	8.00	2.46	3.00
Potato Guano	7.00	2.46	7.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	50.00
Scotland Neck Guano Co., Scotland Neck, N. C.—			
Our 16 Per Cent Acid Phosphate	16.00	....	....
Our 14 Per Cent Acid Phosphate	14.00	....	....
Our Bone and Potash Mixture	10.00	....	4.00
Our Favorite Cotton Seed Meal Guano	9.00	1.65	2.00
Our Bright Tobacco Guano	8.00	2.47	3.00
Our Cotton Grower	8.00	1.65	2.00
Our Best Peanut Guano	5.50	1.23	5.50
Noah Biggs Truck Guano	9.00	4.10	5.00
Biggs Cotton Seed Meal Fish Scrap Guano	9.00	3.30	4.00
Josey's Cotton Seed Meal and Fish Scrap Tobacco Guano	9.00	2.47	3.00
Old Halifax Cotton Seed Meal and Fish Scrap Tobacco Guano	9.00	2.47	3.00
Scotland Neck's Favorite Cotton Seed Meal and Fish Scrap Guano	9.00	2.05	2.50
Josey's Cotton Seed Meal and Fish Scrap Cotton Grower	9.00	2.05	2.50
K. Elite Top Dressing	3.00	7.40	3.50
Nitrate of Soda	....	15.50	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	48.00
Our Genuine German Kainit	....	....	12.00
The Southern Exchange Co., Maxton, N. C.—			
S. E. C. Acid Phosphate	16.00	....	....
S. E. C. Acid Phosphate	14.00	....	....
S. E. C. Bone and Potash Mixture	10.00	....	4.00
S. E. C. Bone and Potash Mixture	10.00	....	2.00
Juicy Fruit Fertilizer	9.00	1.85	4.00
The Walnut Fertilizer	8.50	2.06	2.50
Melon Grower	8.00	4.12	7.00
McKimmon's Special Truck Formula	8.00	4.12	7.00
Southern Exchange Co.'s Bright Tobacco Formula	8.00	2.47	4.00
That Big Stick Guano	8.00	2.47	4.00
Bull of the Woods Fertilizer	8.00	2.47	4.00
Jack's Best Fertilizer	8.00	2.47	3.00
Correct Cotton Compound	8.00	2.47	3.00
R. M. C. Special Crop Grower	8.00	2.47	3.00
Southern Exchange Co.'s Special Tobacco Fertilizer	8.00	1.65	3.00
Currie's Crop Lifter	8.00	1.65	3.00
The Racer Guano	8.00	1.65	3.00
The Coon Guano	8.00	1.65	2.00
Two Fours Guano	8.00	3.30	4.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Southern Cotton Oil Co., Charlotte District, Concord, Charlotte, Davidson, Shelby, Gibson, Monroe and Wadesboro.—			
Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
Gold Seal	14.00	....	....
Silver King	13.00	....	....
Conqueror Bone and Potash	10.00	....	4.00
Magnolia Bone and Potash	10.00	....	2.00
Uncle Sam	9.00	2.47	3.00
Home Made	9.00	2.05	3.00
Razem	9.00	1.65	3.00
King Bee	8.65	1.65	2.00
Choice	8.00	3.30	6.00
Conqueror	8.00	3.30	4.00
Canto	8.00	3.29	6.00
Melonite	8.00	3.29	4.00
Peacock	8.00	2.47	3.00
Moon	8.00	2.47	3.00
Red Bull	8.00	2.06	2.00
All-to-Good	8.00	2.05	3.00
Gloria	8.00	1.65	2.00
Double Two	8.00	1.65	2.00
Dandy Top Dresser	4.00	9.07	2.50
Nitrate of Soda	....	15.65	....
Nitrate of Soda	....	13.20	....
Labi	....	8.99	17.00
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Southern Cotton Oil Co., Goldsboro, Fayetteville, Rocky Mount and Wilson.—			
Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
Southern Cotton Oil Co.'s 14 Per Cent Acid Phosphate	14.00	....	....
Southern Cotton Oil Special Mixture	8.00	3.30	4.00
Southern Cotton Oil Co.'s Special Cotton Grower	8.00	2.47	3.00
Best & Thompson's Special Cotton Grower	9.00	2.27	2.00
Best & Thompson's High Grade	8.00	2.47	3.00
Goldsboro Cotton Grower	9.00	2.26	2.00
Goldsboro Oil Mill Special Mixture	8.00	3.30	4.00
Goldsboro Oil Mill Special Cotton Grower	8.00	2.47	3.00
Goldsboro Oil Mill High Grade	8.00	2.26	2.50
Goldsboro Oil Mill Standard	8.00	1.65	2.00
Fayetteville Oil Mill Special Mixture	8.00	3.30	4.00
Fayetteville Oil Mill Special Cotton Grower	8.00	2.47	3.00
Fayetteville Oil Mill High Grade	8.00	2.26	2.50
Fayetteville Oil Mill Standard	8.00	1.65	2.00
Wilson Oil Mill Special Mixture	8.00	3.30	4.00
Wilson Oil Mill Special Cotton Grower	8.00	2.47	3.00
Wilson Oil Mill High Grade	8.00	2.26	2.50
Wilson Oil Mill Standard	8.00	1.65	2.00
Rocky Mount Oil Mill Special Mixture	8.00	3.30	4.00
Rocky Mount Oil Mill Special Cotton Grower,	8.00	2.47	3.00
Rocky Mount Oil Mill High Grade	8.00	2.26	2.50
Rocky Mount Oil Mill Standard	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail Phos. Acid.	Nitrogen.	Potash.
B. G. Thompson's Special Cotton and Tobacco Guano	8.00	2.47	3.00
The Southern Cotton Oil Co.'s Special Tobacco Grower	8.00	2.47	3.00
The Southern Cotton Oil Co. High Grade	8.00	2.26	2.50
The Southern Cotton Oil Co. Standard	8.00	1.65	2.00
Edgerton's Old Reliable	8.00	2.47	3.00
Morning Glory	8.00	2.47	3.00
Echo	8.00	2.06	3.00
Southern Special for Tobacco	6.00	2.90	6.00
Southern Special for Tobacco	6.00	2.89	6.00
Statesville Oil and Fertilizer Co., Statesville, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
H. G. Acid Phosphate	14.00	....	....
Bone and Potash, 10-4	10.00	....	4.00
Bone and Potash, 10-2	10.00	....	2.00
833 Soluble Guano	8.00	2.47	3.00
King Cotton Soluble Guano	8.00	2.47	3.00
Grasoir	8.00	1.65	2.00
822 Statesville Oil and Fertilizer Co.	8.00	1.65	2.00
Tidewater Guano Co., Norfolk, Va.—			
Tidewater Raw Bone Meal.....Total	20.00	3.71	....
Top Rail Acid Phosphate	16.00	....	....
Buster Brown Acid Phosphate	14.00	....	....
Bully Boy Dissolved Bone and Potash	10.00	....	2.00
Diamond Brand Bone and Potash Compound	10.00	....	2.00
High Tide Soluble Guano	8.00	3.30	4.00
Sho Nuf Guano, H. G.	8.00	2.48	3.00
Hawk Eye Soluble Guano	8.00	2.06	2.00
Soil King Special H. G. Guano	8.00	1.86	4.00
Double Action Soluble Guano	8.00	1.65	2.00
Genuine German Kainit	....	....	12.00
Tuscarora Fertilizer Co., Atlanta, Ga., and Wilmington, N. C.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Tuscarora Alkaline Bone	10.00	....	5.00
Tuscarora Acid and Potash	10.00	....	4.00
Tuscarora Bone and Potash	10.00	....	2.00
Tuscarora Bone and Potash	8.00	....	4.00
Tuscarora Trucker	8.00	4.12	7.00
Tuscarora Champion	8.00	2.06	2.50
Tuscarora Fruit and Potato	8.00	1.65	10.00
Tuscarora Fertilizer No. 8-2-5	8.00	1.65	5.00
Tuscarora Standard	8.00	1.65	2.00
Manure Substitute	6.00	3.30	4.00
Fertilizer No. 844	8.00	3.30	4.00
Tobacco Special	8.00	2.47	3.00
Cotton Special	8.00	2.47	3.00
Berry King	8.00	2.06	4.00
King Cotton	8.00	2.06	2.00
Big (4) Four Fertilizer	7.00	1.65	4.00
Nitrate of Soda	....	14.81	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
B. G. Thompson, Goldsboro, N. C.—			
Genuine German Kainit	....	....	12.00
Union Guano Co., Winston-Salem, N. C.—			
Raw Animal Bone Meal.....Total	23.00	2.47	....
Pure Animal Bone Meal.....Total	22.50	3.71	....
Pure Animal Bone Meal.....Total	22.50	2.47	....
Union 16 Per Cent Acid Phosphate	16.00	....	....
Union 12-6 Bone and Potash	12.00	....	6.00
Union 12-5 Bone and Potash	12.00	....	5.00
Union 12-4 Bone and Potash	12.00	....	4.00
Union 12-3 Bone and Potash	12.00	....	3.00
Union 12 Per Cent Acid Phosphate	12.00	....	....
Union 10-6 Bone and Potash	10.00	....	6.00
Union 10-5 Bone and Potash	10.00	....	5.00
Union 10-4 Bone and Potash	10.00	....	4.00
Union 8-5 Bone and Potash	8.00	....	5.00
Union High Grade Acid Phosphate	14.00	....	....
Union Dissolved Animal Bone.....Total	13.00	2.06	....
Union Dissolved Bone	13.00	....	....
Union Prolific Cotton Compound	10.00	3.29	4.00
Union Special Formula for Cotton	10.00	2.47	3.00
Union Mule Brand Guano	10.00	1.65	2.00
Union Bone and Potash	10.00	....	2.00
Union Perfect Cotton Grower	9.00	2.26	2.00
Union Complete Cotton Mixture	9.00	1.65	3.00
Union Approved Crop Grower	8.75	1.65	2.00
Union Guano for Cotton and Tobacco	8.00	3.29	6.00
Union Premium Guano	8.00	3.29	4.00
Union Homestead Guano	8.00	2.47	3.00
Union Water Fowl Guano	8.00	2.06	3.00
Union Standard Tobacco Grower	8.00	2.06	2.00
Union Potato Mixture	8.00	1.65	10.00
Union Superlative Guano	8.00	.82	4.00
Union Wheat Mixture	8.00	....	4.00
Union Vegetable Compound	7.00	4.12	8.00
Union Truck Guano	7.00	3.29	5.00
Liberty Bell Crop Grower	10.50	....	1.50
Quakers' Grain Mixture	10.00	....	4.00
Giant Phosphate and Potash	10.00	....	3.00
Finch & Harris' Special Bone and Potash Mixture	10.00	....	3.00
Farmers' Blood and Bone Guano	9.00	1.65	3.00
Q and Q (Quality and Quantity) Guano	9.00	1.65	1.00
"B. S." Ammoniated Guano	9.00	.82	3.00
Victoria High Grade Tobacco Guano	8.00	2.47	3.00
Sparger's Special Tobacco Grower	8.00	1.65	3.00
Old Honesty Guano	8.00	1.65	2.00
Old Honesty Tobacco Guano	8.00	1.65	2.00
Fish Brand Ammoniated Guano	8.00	1.65	2.00
Sunrise Ammoniated Guano	8.00	.82	3.00
Nitrate of Soda	....	14.83	....
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Union Abattoir Co., Baltimore, Md., and Richmond, Va.—			
Pure Bone and Potash Compound	16.00	1.64	2.50
Pure Dissolved Animal Bone	12.00	1.64	....
Potash and Soluble Bone (Red Star)	12.00	....	3.00
Red Star Acid Phosphate	16.00	....	....
Red Star Acid Phosphate	14.00	....	....
Red Star Potash and Soluble Bone	12.00	....	5.00
Red Star Potash and Soluble Bone	10.00	....	5.00
Red Star Potash and Soluble Bone	10.00	....	2.00
Red Star Brand Tobacco Compound	9.00	3.27	2.00
Red Star Brand Cotton Guano	8.00	3.29	4.00
Red Star Early Truck and Tobacco Guano	8.00	3.28	4.00
Red Star Cotton and Tobacco Guano	8.00	2.46	3.00
Red Star Cotton Guano	8.00	1.64	2.00
Red Star Tobacco Fertilizer	8.00	2.05	2.00
Red Star Standard	8.00	1.65	2.00
Red Star Grain and Grass	8.00	1.00	4.00
Red Star Peanut Grower	8.00	1.00	4.00
Red Star Potato Manure	7.00	2.46	10.00
Red Star Special Guano	7.00	2.46	5.00
Red Star 7 Per Cent Guano	6.00	5.74	5.00
Early Potato and Truck Guano	6.00	4.10	7.00
Nitrate of Soda	....	15.58	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
R. L. Upshur, Norfolk, Va.—			
Upshur's 16 Per Cent Acid Phosphate	16.00	....	....
Upshur's High Grade Acid Phosphate	14.00	....	....
Upshur's Wheat Compound	12.00	....	5.00
Upshur's Bone and Potash Guano	10.00	....	2.00
Upshur's O. P. (Old Plantation)	9.00	1.65	2.00
Upshur's 8-3-3 Cotton	8.00	2.47	3.00
Upshur's High Grade Tobacco Guano	8.00	2.47	3.00
Upshur's Special 2½-8-3	8.00	2.05	3.00
Upshur's F. F. V. (Favorite Fertilizer of Virginia)	8.00	1.65	2.00
Upshur's Peanut Guano	8.00	1.65	2.00
Upshur's G., G. & C. Guano	8.00	1.65	2.00
Upshur's Fish, Bone and Potash	8.00	1.64	4.00
Upshur's Formula, No. 1	7.00	6.58	11.00
Upshur's Formula, No. 2	7.00	6.58	5.00
Upshur's Special Truck Guano	7.00	4.11	8.00
Upshur's F. F. (Farmers' Favorite)	7.00	4.11	6.00
Upshur's F. C. (Farmers' Challenge)	6.00	5.76	6.00
Upshur's 7 Per Cent Irish Potato Guano	6.00	5.76	5.00
Upshur's 4-6-4	6.00	3.69	4.00
Upshur's Top Dresser Guano	5.00	8.23	2.00
Upshur's Norfolk Special 10 Per Cent	5.00	8.23	2.00
Upshur's Special Potato Guano	5.00	5.76	5.00
Upshur's 5 Per Cent	5.00	4.11	5.00
Cotton-seed Meal Mixture	9.00	2.26	2.00
Premo Cotton Guano	8.00	1.65	2.00
Nitrate of Soda	....	15.22	....
Ground Fish	....	8.23	....
Ground Tankage	....	6.58	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Venable Fertilizer Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone.....Total	20.00	3.29	....
Venable's Best Acid Phosphate.....	16.00	....	....
Venable's Alliance Acid Phosphate.....	14.00	....	....
Venable's Dissolved Bone.....	13.00	....	....
Venable's Standard Acid Phosphate.....	12.00	....	....
Venable's Corn, Wheat and Grass Fertilizer..	10.00	.82	1.00
Venable's B. B. P. Manure.....	9.00	1.65	1.00
Venable's 5 Per Cent Trucker.....	8.00	4.11	5.00
Venable's 4 Per Cent Trucker.....	8.00	3.29	4.00
Venable's H. G. Tobacco Fertilizer.....	8.00	2.47	3.00
Venable's Alliance Tobacco Manure, No. 1....	8.00	2.06	3.00
Venable's Alliance Tobacco Manure, No. 2....	8.00	1.65	2.00
Venable's Alliance Bone and Potash Mixture..	8.00	....	4.00
Venable's Cotton Grower.....	8.00	2.06	3.00
Venable's Roanoke Special.....	8.00	2.06	3.00
Venable's Ideal Manure.....	8.00	1.65	5.00
Venable's Meal Mixture.....	8.00	1.65	2.00
Venable's Peanut Special.....	8.00	.82	4.00
Venable's Peanut Grower.....	8.00	....	4.00
Venable's 10 Per Cent Trucker.....	6.00	8.23	2.00
Venable's 6-6-6 Manure.....	6.00	4.94	6.00
High Grade Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Roanoke Mixture	9.00	2.26	2.00
Roanoke Meal Mixture.....	9.00	2.26	2.00
Ballard's Choice Fertilizer.....	8.00	2.47	3.00
Our Union Tobacco Fertilizer.....	8.00	1.65	4.00
Our Union Special Fertilizer.....	8.00	1.65	2.00
Planters' Bone Fertilizer.....	8.00	1.65	2.00
Nitrate of Soda.....	....	15.63	....
Special Top Dresser.....	....	7.30	3.00
Muriate of Potash.....	....	....	50.00
Sulphate of Potash.....	....	....	48.00
Pure German Kainit.....	....	....	12.00
Virginia-Carolina Chemical Co., Richmond, Va.—			
V.-C. C. Co.'s 16 Per Cent Acid Phosphate....	16.00	....	....
V.-C. C. Co.'s 14 Per Cent Acid Phosphate....	14.00	....	....
V.-C. C. Co.'s Special High Grade Potash Mixture	12.00	....	6.00
V.-C. C. Co.'s H. G. Potash Mixture.....	12.00	....	5.00
V.-C. C. Co.'s 12-4 Grain Grower.....	12.00	....	4.00
V.-C. C. Co.'s Special Crop Grower.....	12.00	....	3.00
V.-C. C. Co.'s Grain Special.....	10.00	....	6.00
V.-C. C. Co.'s Standard Bone and Potash....	10.00	....	5.00
V.-C. C. Co.'s Special Potash Mixture.....	10.00	....	4.00
V.-C. C. Co.'s Dissolved Bone and Potash.....	10.00	....	2.00
V.-C. C. Co.'s Cotton Grower.....	9.00	2.26	2.00
V.-C. C. Co.'s Farmers' Choice.....	8.00	3.29	4.00
V.-C. C. Co.'s Special.....	8.00	3.29	4.00
V.-C. C. Co.'s High Grade Tobacco Fertilizer..	8.00	2.47	10.00
V.-C. C. Co.'s Monarch Brand.....	8.00	1.65	5.00
V.-C. C. Co.'s Corn and Peanut Special.....	8.00	1.65	2.00
V.-C. C. Co.'s Special Peanut Grower.....	8.00	1.00	4.00
V.-C. C. Co.'s Peanut Grower.....	8.00	.82	4.00
V.-C. C. Co.'s Potash Mixture for Peanuts....	8.00	....	4.00
V.-C. C. Co.'s Truck Crop Fertilizer.....	7.00	4.12	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s Potash Potato Producer	7.00	3.29	8.00
V.-C. C. Co.'s Formula 44 for Bright Wrappers and Smokers	7.00	2.55	3.30
V.-C. C. Co.'s Special Truck Guano	6.00	4.12	7.00
V.-C. C. Co.'s High Grade Top Dresser	4.00	6.17	2.50
V.-C. C. Co.'s 10 Per Cent Top Dresser Extra H. G.	4.00	8.24	4.00
Johnston's Best	20.00	4.94	6.00
Sludge Acid Phosphate	14.00	....	....
Fulp's Acid Phosphate	13.00	....	....
Goodman's Special Potash Mixture	12.00	....	5.00
Battle's Crop Grower	12.00	....	3.00
Almont Acid Phosphate	12.00	....	....
Virginia 11-5 Bone and Potash	11.00	....	5.00
Sovereign Crop Producer	10.00	1.65	2.00
Ford's Wheat and Corn Guano	10.00	.82	2.50
Great Texas Cotton Grower Soluble Guano	9.00	2.47	4.00
Jeffreys' High Grade Guano	9.00	2.47	3.00
Southern Cotton Grower	9.00	2.29	2.00
Best's Special Cotton Grower	9.00	2.26	2.00
Best's H. G. Cotton and Tobacco Grower	8.00	2.47	3.00
Prolific Cotton Grower	9.00	2.26	2.00
White Stem C. S. M.	9.00	2.26	2.00
Bumper Crop Grower	9.00	2.06	5.00
Star Brand Special H. G.	9.00	2.06	5.00
Cock's Soluble Guano High Grade Animal Bone	9.00	1.85	3.00
Reliable Cotton Brand Fertilizer	9.00	1.65	3.00
North State Guano C. S. M.	9.00	1.65	1.00
Bigelow's Crop Guano	9.00	.82	3.00
Burnhardt's Grain and Crop Guano	9.00	.82	3.00
McCormick's Wheat and Grain Guano	9.00	.82	3.00
Little Giant Grain and Grass Grower	9.00	.82	2.00
Farmers' Friend Favorite Fertilizer Special	8.50	1.65	2.00
Farmers' Success	8.00	2.47	4.00
Powhatan Crop Mixture	8.50	1.65	1.50
Pelican Truck Grower (1,000 pounds Peruvian Guano to the ton)	8.00	4.12	5.00
Carr's 8-4-4 Crop Grower	8.00	3.29	4.00
Jumbo Crop Grower (1,000 pounds Peruvian Guano to the ton)	8.00	2.48	3.00
Lion's High Grade Tobacco Fertilizer	8.00	2.47	4.00
Oldham's Special Compound for Tobacco, H. G.	8.00	2.47	3.00
Blake's Best	8.00	2.47	3.00
Royal High Grade Fertilizer	8.00	2.47	3.00
Special High Grade Tobacco Fertilizer	8.00	2.47	3.00
Adams' Special	8.00	2.47	3.00
Peruvian H. G. Tobacco Guano	8.00	2.47	3.00
Red Chief H. G. Cotton Grower	8.00	2.47	3.00
Zeno Special Compound for Tobacco, H. G.	8.00	2.47	3.00
Gold Medal H. G. Tobacco Guano	8.00	2.47	3.00
Atlas Guano C. S. M.	8.00	2.47	2.50
Admiral	8.00	2.47	2.50
Good Luck C. S. M.	8.00	2.47	2.50
Split Silk C. S. M.	8.00	2.47	2.50
Myatt's Special High Grade Fertilizer	8.00	2.29	3.00
Orange Grove Guano	8.00	2.26	2.50
Delta C. S. M.	8.00	2.26	2.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Royal Crown	8.00	2.26	2.00
Pace's Special 5 Per Cent Potato Guano	8.00	2.06	5.00
Blue Star C. S. M.	8.00	2.06	3.00
Superlative C. S. M. Guano	8.00	2.06	3.00
Smith's Irish Potato Guano	8.00	1.65	10.00
Winston Special for Cotton	8.00	1.65	2.00
Diamond Dust C. S. M.	8.00	1.65	2.00
Plant Food C. S. M.	8.00	1.65	2.00
Wilson's Standard C. S. M.	8.00	1.65	2.00
Ajax C. S. M. Guano	8.00	1.65	2.00
Farmers' Favorite Fertilizer C. S. M.	8.00	1.65	2.00
Parker & Hunter's Special	8.00	1.65	4.00
Charlotte Oil and Fertilizer Co.'s The Leader B. G.	8.00	1.65	2.00
Jones' Grain Special	8.00	....	4.00
Konqueror H. G. Truck Fertilizer	7.00	4.12	5.00
Pasquotank Trucker	7.00	3.29	8.00
Invincible High Grade Fertilizer	6.00	4.12	7.00
Sulphate of Ammonia	....	20.59	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.82	....
Fish Scrap	....	8.24	....
Muriate of Potash	....	....	49.00
Manure Salts	....	....	20.00
Genuine German Kainit	....	....	12.00
Allison & Addison's Fulton Acid Phosphate	14.00	....	....
Allison & Addison's I. X. L. Acid Phosphate	13.00	....	....
Allison & Addison's Standard Acid Phosphate,	12.00	....	....
Allison & Addison's Rocket Acid Phosphate	12.00	....	....
Allison & Addison's B. P. Potash Mixture	10.00	....	2.00
Allison & Addison's McGavock's Special Potash Mixture	10.00	....	2.00
Allison & Addison's Star Special Tobacco Manure	9.00	2.26	2.00
Allison & Addison's Star Brand Guano	9.00	1.65	1.00
Allison & Addison's Little Giant Grain and Grass Grower	9.00	.82	2.00
Allison & Addison's A. A. Guano	8.00	2.47	3.00
Allison & Addison's Anchor Brand Tobacco Fertilizer	8.50	2.26	2.00
Allison & Addison's Star Vegetable Brand Guano	8.00	3.71	4.00
Allison & Addison's Anchor Brand Fertilizer,	8.00	1.65	2.00
Allison & Addison's Old Hickory Guano	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate	16.00	....	....
Atlantic and Virginia Fertilizer Co.'s Valley of Virginia Phosphate	14.00	....	....
Atlantic and Virginia Fertilizer Co.'s Crenshaw Acid Phosphate	13.00	....	....
Atlantic and Virginia Fertilizer Co.'s Our Acid Phosphate	12.00	....	....
Atlantic and Virginia Fertilizer Co.'s Eureka Bone and Potash Compound	10.00	....	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone Special for Tobacco	9.00	2.06	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Complete Manure	9.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Virginia Truckers	8.00	4.12	5.00

Name and Address of Manufacturer and Name of Brand	Avail. Phos. Acid.	Nitrogen.	Potash.
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Special for Tobacco	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Carolina Truckers	7.00	5.76	7.00
Charlotte Oil and Fertilizer Co.'s 15 Per Cent Acid Phosphate	15.00	....	....
Charlotte Oil and Fertilizer Co.'s Catawba Bone Phosphate	14.00	....	....
Charlotte Oil and Fertilizer Co.'s Charlotte Acid Phosphate	13.00	....	....
Charlotte Oil and Fertilizer Co.'s Dayvault's Special	12.00	....	6.00
Charlotte Oil and Fertilizer Co.'s Charlotte Dissolved Bone	12.00	....	....
Charlotte Oil and Fertilizer Co.'s Oliver's Perfect Wheat Grower	11.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s 10-2 Bone and Potash	10.00	....	2.00
Charlotte Oil and Fertilizer Co.'s High Grade Special Tobacco Fertilizer	9.00	2.06	2.00
Charlotte Oil and Fertilizer Co.'s Queen of the Harvest C. S. M.	9.00	1.65	2.00
Charlotte Oil and Fertilizer Co.'s McCrary's Diamond Bone and Potash	9.00	....	3.00
Charlotte Oil and Fertilizer Co.'s Groom's Special Tobacco Fertilizer	8.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s Catawba Guano B. G.	8.00	2.47	3.00
Charlotte Oil and Fertilizer Co.'s Special 3 Per Cent Guano C. S. M.	8.00	2.47	2.00
Charlotte Oil and Fertilizer Co.'s Charlotte Ammoniated Guano B. G.	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s Charlotte Ammoniated Guano C. S. M.	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s King Cotton Grower	8.00	1.65	2.00
Davie & Whittle's Owl Brand High Grade Acid Phosphate	16.00	....	....
Davie & Whittle's Owl Brand High Grade Dissolved Bone	14.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate,	13.00	....	....
Davie & Whittle's Owl Brand Dissolved Bone,	12.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate with Potash	10.00	....	2.00
Davie & Whittle's Owl Brand High Grade 3 Per Cent Soluble Guano	9.00	2.06	3.00
Davie & Whittle's Owl Brand Special Tobacco Guano	9.00	2.06	2.00
Davie & Whittle's Owl Brand Truck Guano..	8.00	4.94	5.00
Davie & Whittle's Owl Brand Guano for Tobacco	8.00	2.47	3.00
Davie & Whittle's Vinco Guano	8.00	1.65	3.00
Davie & Whittle's Owl Brand Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Durham Best Acid Phosphate	16.00	....	....
Durham Fertilizer Co.'s Standard High Grade Acid Phosphate	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Durham Fertilizer Co.'s Excelsior Dissolved Bone Phosphate	14.00	....	....
Durham Fertilizer Co.'s Blacksburg Dissolved Bone	13.00	....	....
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official Acid Phosphate	13.00	....	....
Durham Fertilizer Co.'s Double Bone Phosphate	13.00	....	....
Durham Fertilizer Co.'s Durham Acid Phosphate	12.00	....	....
Durham Fertilizer Co.'s Great Wheat and Corn Grower	10.50	....	1.50
Durham Fertilizer Co.'s Diamond Wheat Mixture	10.00	....	3.00
Durham Fertilizer Co.'s Standard Wheat and Corn Grower	10.00	....	2.00
Durham Fertilizer Co.'s Blue Ridge Wheat Grower	10.00	....	2.00
Durham Fertilizer Co.'s Standard Wheat Grower	10.00	....	2.00
Durham Fertilizer Co.'s Durham Bone and Potash Mixture	10.00	....	2.00
Durham Fertilizer Co.'s L. & N. Special	9.00	2.47	2.06
Durham Fertilizer Co.'s Standard Guano	9.00	1.65	2.00
Durham Fertilizer Co.'s Durham Ammoniated Fertilizer	9.00	1.65	1.00
Durham Fertilizer Co.'s Special Plant and Truck Fertilizer	8.00	4.12	3.00
Durham Fertilizer Co.'s Durham High Grade,	8.00	3.29	4.00
Durham Fertilizer Co.'s Gold Medal Brand Guano	8.00	2.47	3.00
Durham Fertilizer Co.'s Yellow Leaf Tobacco Guano	8.00	2.47	3.00
Diamond Cotton-seed Meal Guano	8.00	2.47	3.00
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official Guano	8.00	2.06	3.00
Durham Fertilizer Co.'s Pride of Durham Tobacco Grower	8.00	2.06	3.00
Durham Fertilizer Co.'s Raw Bone Superphosphate for Tobacco	8.00	2.06	2.00
Durham Fertilizer Co.'s Raw Bone Superphosphate	8.00	2.06	1.50
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Genuine Bone and Peruvian Tobacco Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Blacksburg Soluble Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Progressive Farmer Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Carr's Special Wheat Grower	8.00	....	4.00
Durham Fertilizer Co.'s Best Potato Manure,	7.00	5.76	7.00
Lynchburg Guano Co.'s Ironside Acid Phosphate	16.00	....	....
Lynchburg Guano Co.'s Lynchburg High Grade Acid Phosphate	14.00	....	....
Lynchburg Guano Co.'s Arvonia Acid Phosphate	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Lynchburg Guano Co.'s Spartan Acid Phosphate	12.00	....	....
Lynchburg Guano Co.'s Alpine Mixture	10.00	....	5.00
Lynchburg Guano Co.'s S. W. Special Bone and Potash Mixture	10.00	....	4.00
Lynchburg Guano Co.'s Dissolved Bone and Potash	10.00	....	2.00
Lynchburg Guano Co.'s Independent Standard,	8.50	1.65	2.00
Lynchburg Guano Co.'s Bright Belt Guano	8.00	2.47	3.00
Lynchburg Guano Co.'s Solid Gold Tobacco	8.00	2.26	4.00
Lynchburg Guano Co.'s New Era	8.00	1.65	3.00
Lynchburg Guano Co.'s Lynchburg Soluble	8.00	1.65	2.00
Lynchburg Guano Co.'s Lynchburg Soluble for Tobacco	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Reliable Acid Phosphate	14.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Best Acid Phosphate	13.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Soluble Bone	12.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Bone and Potash	10.00	....	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Trucker and Tomato Grower	8.00	4.12	5.00
Norfolk and Carolina Chemical Co.'s Amazon High Grade Manure	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Grower	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Amazon H. G. Special Tobacco Guano	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Cooper's Bright Tobacco Fertilizer	8.00	2.06	3.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Made Especially for Tobacco	8.00	2.06	2.00
Norfolk and Carolina Chemical Co.'s Crescent Brand Ammoniated Fertilizer	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s High Grade Acid Phosphate	14.00	....	....
Old Dominion Guano Co.'s Bone Phosphate	13.00	....	....
Old Dominion Guano Co.'s Royster's Acid Phosphate	12.00	....	....
Old Dominion Guano Co.'s Obelisk Brand Bone and Potash	10.00	....	4.00
Old Dominion Guano Co.'s Planters' Bone and Potash Mixture	10.00	....	3.00
Old Dominion Guano Co.'s Old Dominion Alkaline Bone and Potash	10.00	....	2.00
Old Dominion Guano Co.'s Horne's Cotton Fertilizer	9.00	2.06	3.00
Old Dominion Guano Co.'s Standard Raw Bone Soluble Guano	9.00	1.65	1.00
Old Dominion Guano Co.'s Farmers' Friend High Grade Fertilizer	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Friend Special Tobacco Fertilizer	8.00	2.47	3.00
Old Dominion Guano Co.'s Osceola Tobacco Guano	8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Old Dominion Guano Co.'s Farmers' Friend Fertilizer	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Special Wheat Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Tobacco Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Bullock's Cotton Grower	8.00	1.65	2.00
Old Dominion Guano Co.'s Millers' Special Wheat Mixture	8.00	....	4.00
Old Dominion Guano Co.'s Old Dominion 7-7-7 Truck Guano	7.00	5.76	7.00
Old Dominion Guano Co.'s Old Dominion Potato Manure	7.00	4.12	8.00
Old Dominion Guano Co.'s 7 Per Cent Truck Fertilizer	6.00	5.76	6.00
Old Dominion Guano Co.'s Old Dominion 6-7-5 Truck Guano	6.00	5.76	5.00
Old Dominion Guano Co.'s Old Dominion Special Sweet Potato Guano	6.00	1.65	6.00
Old Dominion Guano Co.'s 10 Per Cent Truck Fertilizer	5.00	8.24	2.50
Powers, Gibbs & Co.'s Almont High Grade Acid Phosphate	14.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Best Acid Phosphate	13.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate	12.00	....	....
Powers, Gibbs & Co.'s Acid Phosphate and Potash	10.50	....	1.50
Powers, Gibbs & Co.'s Almont Wheat Mixture.	10.00	....	3.00
Powers, Gibbs & Co.'s Dissolved Bone and Potash	10.00	....	2.00
Powers, Gibbs & Co.'s Cotton Seed Meal Standard Guano	9.00	2.47	2.00
Powers, Gibbs & Co.'s Truck Farmers' Special Ammoniated Guano	8.00	3.29	5.00
Powers, Gibbs & Co.'s Cotton Brand Ammoniated Dissolved Bone	8.00	3.29	4.00
Powers, Gibbs & Co.'s Old Kentucky High Grade Manure	8.00	2.47	3.00
Powers, Gibbs & Co.'s Cotton Belt Ammoniated Guano	8.00	2.47	2.00
Powers, Gibbs & Co.'s Carolina Golden Belt Ammoniated Guano for Tobacco	8.00	2.06	3.00
Powers, Gibbs & Co.'s Powers' Ammoniated Guano	8.00	2.06	2.00
Powers, Gibbs & Co.'s Gibbs' Ammoniated Guano	8.00	2.06	1.50
Powers, Gibbs & Co.'s Almont Soluble Ammoniated Guano	8.00	1.65	2.00
Powers, Gibbs & Co.'s Cotton Seed Meal Soluble Ammoniated Guano	8.00	1.65	2.00
Powers, Gibbs & Co.'s Eagle Island Ammoniated	8.00	1.65	2.00
Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate	16.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Southern Chemical Co.'s Chick's 16 Per Cent Acid Phosphate	16.00	....	....
Southern Chemical Co.'s Red Cross 14 Per Cent Acid Phosphate	14.00	....	....
Southern Chemical Co.'s Victor Acid Phosphate	13.00	....	....
Southern Chemical Co.'s Chatham Acid Phosphate	13.00	....	....
Southern Chemical Co.'s Reaper Grain Application	12.00	....	3.00
Southern Chemical Co.'s Tar Heel Acid Phosphate	12.00	....	....
Southern Chemical Co.'s Horseshoe Acid Phosphate	12.00	....	....
Southern Chemical Co.'s Quickstep Bone and Potash	11.00	....	5.00
Southern Chemical Co.'s Solid South	10.00	....	6.00
Southern Chemical Co.'s Winner Grain Mixture	10.00	....	4.00
Southern Chemical Co.'s Farmers' Pride Bone and Potash	10.00	....	3.00
Southern Chemical Co.'s Winston Bone and Potash Compound	10.00	....	2.00
Southern Chemical Co.'s Mammoth Corn Grower	10.00	....	2.00
Southern Chemical Co.'s Mammoth Wheat and Grass Grower	10.00	....	2.00
Southern Chemical Co.'s Sun Brand Guano	9.00	2.06	5.00
Southern Chemical Co.'s George Washington Plant Bed Fertilizer for Tobacco	8.00	2.47	2.50
Southern Chemical Co.'s Pilot Ammoniated Guano Special for Tobacco	8.00	2.06	3.00
Southern Chemical Co.'s Electric Tobacco Guano	8.00	1.65	2.00
Southern Chemical Co.'s Electric Standard Guano	8.00	1.65	2.00
Southern Chemical Co.'s Yadkin Complete Fertilizer	8.00	1.65	2.00
Southern Chemical Co.'s Chick's Special Wheat Compound	8.00	....	4.00
J. G. Tinsley & Co.'s Powhatan Acid Phosphate	14.00	....	....
J. G. Tinsley & Co.'s Tinsley's Dissolved S. C. Bone	13.00	....	....
J. G. Tinsley & Co.'s Stonewall Brand Acid Phosphate	12.00	....	....
J. G. Tinsley & Co.'s Tinsley's Bone and Potash Mixture	10.00	....	2.00
J. G. Tinsley & Co.'s Tinsley's Tobacco Fertilizer	8.00	3.29	2.50
J. G. Tinsley & Co.'s Richmond Brand Guano,	8.00	2.47	3.00
J. G. Tinsley & Co.'s Killickinick Tobacco Mixture	8.00	2.06	3.00
J. G. Tinsley & Co.'s Lee Brand Guano	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Brand Guano,	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Tobacco Guano,	8.00	1.65	2.00
J. G. Tinsley & Co.'s Tinsley's Special Irish Potato Guano	6.00	5.76	6.00
J. G. Tinsley & Co.'s Tinsley's 7 Per Cent Ammoniated Guano for Beans, Peas, Cabbage, Strawberries, etc	6.00	5.76	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
J. G. Tinsley & Co.'s Tinsley's Irish Potato Guano	6.00	4.94	6.00
J. G. Tinsley & Co.'s Tinsley's Strawberry Grower	6.00	3.29	4.00
J. G. Tinsley & Co.'s Tinsley's Top Dresser	5.00	9.06	....
J. G. Tinsley & Co.'s Tinsley's 10 Per Cent Truck Guano	5.00	8.24	2.50
S. W. Travers & Co.'s Champion Acid Phosphate	16.00	....	....
S. W. Travers & Co.'s Travers' Dissolved Acid Phosphate	14.00	....	....
S. W. Travers & Co.'s Standard Dissolved S. C. Bone	13.00	....	....
S. W. Travers & Co.'s Capital Dissolved Bone,	12.00	....	....
S. W. Travers & Co.'s Capital Bone and Potash Compound	10.00	....	2.00
S. W. Travers & Co.'s Capital Truck Fertilizer,	8.00	3.29	3.00
S. W. Travers & Co.'s Capital Tobacco Fertilizer	8.00	3.29	3.00
S. W. Travers & Co.'s Big Leaf Tobacco Grower, H. G	8.00	2.47	3.00
S. W. Travers & Co.'s Capital Cotton Fertilizer,	8.00	2.06	2.00
S. W. Travers & Co.'s National Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s National Special Tobacco Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s Beef, Blood and Bone Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s Travers' Special Wheat Compound	8.00	....	4.00
S. W. Travers & Co.'s Travers' 7 Per Cent Truck Fertilizer	6.00	5.76	5.00
Virginia State Fertilizer Co.'s Bull Run Acid Phosphate	16.00	....	....
Virginia State Fertilizer Co.'s Gilt Edge Brand Acid Phosphate	14.00	....	....
Virginia State Fertilizer Co.'s Clipper Brand Acid Phosphate	13.00	....	....
Virginia State Fertilizer Co.'s Lurich Acid Phosphate	12.00	....	....
Virginia State Fertilizer Co.'s Alps Brand Acid Phosphate	12.00	....	....
Virginia State Fertilizer Co.'s Mountain Top Bone and Potash	10.00	....	5.00
Virginia State Fertilizer Co.'s XX Potash Mixture	10.00	....	4.00
Virginia State Fertilizer Co.'s Virginia State Dissolved Bone and Potash	10.00	....	2.00
Virginia State Fertilizer Co.'s Number One Soluble Guano	9.00	1.65	2.00
Virginia State Fertilizer Co.'s Highland King,	9.00	1.65	1.00
Virginia State Fertilizer Co.'s Gamecock Special for Tobacco	8.50	1.65	2.00
Virginia State Fertilizer Co.'s Virginia State High Grade Tobacco Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Bull Dog Soluble Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Dunnington's Special Formula for Tobacco	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia State Fertilizer Co.'s Peerless Tobacco Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Buffalo Guano,	8.00	2.06	3.00
Virginia State Fertilizer Co.'s Austrian Tobacco Grower	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Gilt Edge Special Tobacco Guano	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Virginia State Guano	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Battle Axe Tobacco Guano	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Gilt Edge Brand Dissolved Bone and Potash	8.00	....	4.00
Thomas Wakefield, Friendship, N. C.—			
Bone Meal .....Total	21.73	4.12	....
Williams & Clark Fertilizer Co., Charleston, S. C.—			
Standard Americus Ammoniated Bone Superphosphate	9.00	1.85	1.00
Winborne Guano Co., Norfolk, Va.—			
Standard 16 Per Cent Acid Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
Soluble Bone and Potash	10.00	....	2.00
Winborne's 3-8-4 Guano	8.00	2.47	4.00
Winborne's Tobacco Guano	8.00	2.47	3.00
Winborne's Excelsior Guano	8.00	1.65	2.00
Winborne's Eureka Guano	8.00	1.65	2.00
Winborne's Triumph Guano	8.00	1.65	2.00
Winborne's Special Peanut Guano	8.00	.82	4.00
Winborne's 7 Per Cent Guano	5.00	5.75	5.00
King Taminy Guano	8.00	2.47	3.00
Farmers' Select Guano	8.00	2.06	3.00
Nitrate of Soda	....	15.65	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
T. W. Wood & Sons, Richmond, Va.—			
Wood's Pure Animal Bone.....Total	23.00	2.47	....
Standard H. G. Acid Phosphate	16.00	....	....
Standard High Grade Acid Phosphate	14.00	....	....
Standard Corn Fertilizer	10.00	.82	1.00
Standard Bone and Potash Mixture	10.00	....	2.00
Standard Crop Grower	9.00	.82	2.00
Standard Wheat Fertilizer	9.00	.82	2.00
Standard High Grade Trucker Fertilizer	8.00	4.94	6.00
Standard Vegetable Fertilizer	8.00	2.47	3.00
Standard Potash Fertilizer	8.00	1.65	5.00
Standard Grain and Grass Fertilizer	8.00	1.65	2.00
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Wood's Lawn Enricher	6.00	2.47	3.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand	Avail Phos Acid	Nitrogen	Potash
Wessel, Duval & Co., New York.—			
Nitrate of Soda	....	14.85	....
The J. R. Young Fertilizer Co., Norfolk, Va.—			
High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Bone and Potash	10.00	....	2.00
J. R. Young's 2-8¼-9-2 Special Guano	9.00	2.26	2.00
J. R. Young's Special 3-8-3 Guano for Cotton	8.00	2.47	3.00
J. R. Young's New Process 3-8-3 Guano for Tobacco	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Cotton, Corn and Peanuts	8.00	1.65	2.00
J. R. Young's Special Guano for Potatoes	6.00	4.11	5.00
J. R. Young's Improved Fish and Bone Manure for all Crops	6.00	3.29	4.00
J. R. Young's 4-4-6 Special for Tobacco	4.00	3.29	6.00
Genuine German Kainit	....	....	12.00
Fremont H. G. Guano	8.00	3.29	4.00

LEAF TOBACCO SALES FOR MARCH, 1910.

Pounds sold for producers, first hand	8,068,134
Pounds sold for dealers	363,378
Pounds resold for warehouses	655,445
Total	9,086,957

THE BULLETIN

OF THE

NORTH CAROLINA

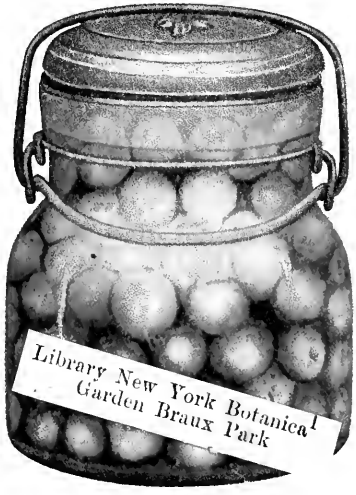
DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. MAY, 1910. Number 5.

THE HOME CANNING OF FRUITS AND VEGETABLES.

By S. B. SHAW.



PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, N. C., April 30, 1910.

SIR:—I herewith submit the results of experimental tests made by Mr. S. B. Shaw, Assistant Horticulturist, in the home canning of fruits and vegetables. There is at this time every evidence of a large crop of fruits and vegetables throughout the State this year. At this the beginning of the canning season, I recommend that these results be published as the regular BULLETIN for the month of May.

Respectfully submitted,

W. N. HUTT,
State Horticulturist.

To HON. WM. A. GRAHAM,
Commissioner of Agriculture.

THE HOME CANNING OF FRUITS AND VEGETABLES.

By S. B. SHAW, Assistant Horticulturist.

Because of the present high prices of food products, the question of the home production and canning of fruits and vegetables is one of vital importance to farmers throughout the entire country. Fruits and vegetables are a necessity, as a healthful diet is not complete without a certain amount of both. An abundance of fresh orchard and garden products can be had in season, but usually the winter supply of these foods must be purchased in the form of commercially canned goods. These are often poor substitutes for the fresh article, especially the cheaper grades, which lack the delicate flavor of the fresh products. In rural communities it is frequently the case that during the winter months the most delicious and wholesome fruits and vegetables are absent from the daily bill of fare. Possibly some tomatoes are canned, some fruits preserved or dried, but the most nutritious vegetables and the most palatable fruits are allowed to spoil in the garden and orchard because of the impression that it is impossible to keep them. This is a mistake. It is just as easy to keep corn, peas and beans as it is to keep peaches and tomatoes—a fact which has been demonstrated by commercial packers who have canned almost every variety of fruit and vegetable.

When the supply of fruit and vegetables is greater than the family needs, and a market is not convenient in which to dispose of this fresh produce, the surplus may be made a source of income by selling it in the form of canned goods. Sometimes those living near a convenient market experience difficulty in finding a ready sale for their produce on account of the glutted condition often existing in the markets of the larger cities. In conditions of this kind, growers can provide themselves with canning outfits, suited in capacity to their needs, put up a clean, reliable grade of goods, market them as judiciously as they do their green stuff, and turn to profit that which otherwise might have been a complete loss.

There seems to be a belief by the general public that there is something mysterious in the commercial canning process. The great secret of this process is a careful observance of two things—*Cleanliness* and *Complete Sterilization*. It is possible for every housewife to run a small canning factory in her own kitchen, and on the farm this is both economical and desirable. Fruits and vegetables can be "put up" in glass jars or tin cans at home much cheaper than they can be purchased in the form of commercially canned goods, and the

flavor, texture and general quality of the home-made product can be made superior to the product of the average factory.

STERILIZATION.

Minute forms of life, which we call bacteria, are present everywhere in untold numbers. The air we breathe, the water we drink, and the food we eat are teeming with them. These bacteria are practically the sole cause of the "spoiling" or fermenting of the various fruits and vegetables. The reproduction of bacteria, which is very rapid, is brought about by one of two processes. The bacterium either divides itself into two parts, making two bacteria where one existed before, or else reproduces itself by means of spores. Spores may be compared with the seed of an ordinary plant. These spores present the chief difficulty in canning the products of the orchard and garden.

All forms of bacteria are killed by complete sterilization. This is nothing more than enclosing the products to be sterilized in jars or cans that can be sealed air-tight and submitting them to heat of sufficient temperature for a time, long enough to destroy the bacteria that cause the raw material to spoil. Sterilization is readily accomplished by the use of boiling water. There are three different ways by which this can be done. While the parent bacteria can be killed at the temperature of boiling water, their spores retain their vitality for a long time even at that temperature. In large commercial factories, sterilization is accomplished by subjecting the cans containing the various products to steam under pressure. By this process the temperature is raised to a degree higher than that of boiling water, thereby killing both bacteria and spores at the same time. Smaller factories and the different home-canning outfits usually make use of the "open-kettle" process. Here the cans are submerged in boiling water and kept at that temperature for a time sufficient to destroy bacteria and spores. The third process, known as fractional sterilization, is that of keeping cans or jars in boiling water for a specified time upon each of two or three consecutive days.

The process of boiling upon consecutive days is the safest method and is much to be preferred in home canning. The first day's boiling kills practically all the bacteria, but does not kill the spores. As soon as the jars or cans cool, these spores develop and a new lot of bacteria begin their destructive work on the contents. The second day's boiling kills this new lot of bacteria before they have had time to produce spores. Boiling the third day is not always necessary, but it is advisable in order to be *sure* that the sterilization is complete.

SELECTION AND PREPARATION OF FRUIT AND VEGETABLES.

The quality of any canned product is largely dependent upon its condition when first packed. As a rule, large canning establishments are clean and have the most convenient appliances with which to do the work. This is one of the main reasons for the ready sale of their goods. The products to be canned, the various utensils used, the cans or jars and the entire surroundings *cannot be too clean.* Cleanliness is half the secret of making the canning business a success.

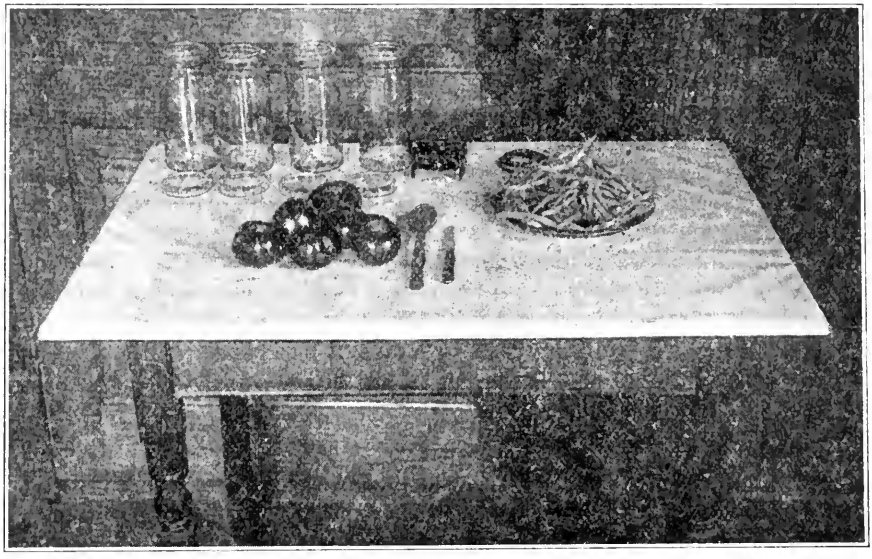


FIG. 1. Clean surroundings in the preparation of vegetables.

In selecting fruit, use only those specimens that are well grown, ripe, but firm. Do not use overripe specimens, as they are usually too soft and mellow to can nicely. When choosing vegetables, select those that are young and have made a rapid growth. As a rule, young, quick-growing vegetables are superior in flavor and texture to the slow growing and more mature ones. Fruits and vegetables are in better condition if gathered in the early morning while the dew is still on them. If it is not convenient to attend to the canning just at this time, put the fruit or vegetables in some cool place where they will not wither, but will keep fresh and crisp until ready for use. It is not advisable, however, to delay the canning too long, as both fruit and vegetables lose some of their best qualities when kept for a length of time.

Fruits and vegetables to be canned are prepared in exactly the same way as they would be previous to cooking or serving for

immediate use. All bruised and rotten places should be cut out and all stems, leaves and other kinds of trash removed. See that everything is clean and washed thoroughly in *Fresh* water before being placed in the jars or cans. These should also have been well washed and made perfectly clean. Do not attempt to can decayed or dirty fruits and vegetables. Have everything *Clean* and *Fresh*.

TIN CANS.

Fruits and vegetables can be packed and cooked in glass jars as easily as in tin cans, but the latter are to be preferred when the canning is done for commercial purposes. Goods packed in tin can be placed on the market much more easily and at less expense than if put in glass. Some commercial packers find it more profitable to market the extra fancy grades of certain fruits and vegetables in glass. Choice varieties of figs, cherries, asparagus and mushrooms are marketed in this way; but for all general purposes tin cans are the most satisfactory.

In buying cans do not allow a slight difference in the price to cause the use of anything but the best. Standard packers' cans are used generally, but extra-coated tin, inside-lacquered, acid-proof cans are still better. These cost a little more than the cheaper grades, but give better results. There is also a lacquer now made to use on the outside of the can to prevent rust. This adds greatly to the keeping and selling qualities of the goods. People do not like to buy goods in dirty or rusty cans, even though the contents may be of excellent quality.

GLASS JARS.

For strictly home purposes, glass jars are more satisfactory and are decidedly more economical than tin cans, although both may be used. The initial expense of glass is greater than that of tin, but with reasonable care, glass will last an indefinite length of time. Glass jars can be used over and over again with perfect safety,

FIG. 2. Different types of jars.

but tin should never be used the second time. Tin is more or less soluble in fruit and vegetable juices. While the amount of tin dissolved under ordinary conditions is too small to be at all injurious, still it has been enough to make the can unfit for use the second time.

There are numerous kinds of glass jars on the market, many of them having certain distinct points of advantage. See Fig. 2. The jar most commonly used is the ordinary screw-top type. See Fig. 2, Nos. 4 and 7. Although they are cheap in price, it is hard to do successful canning in them on account of the difficulty in sealing them air-tight during the processing or cooking. The tops are usually metal with a porcelain lining that sooner or later may become loosened and come out, thereby making the top unsatisfactory for use. Jars of this type can best be used for rich preserves, jams and jellies where complete sterilization is not of so much importance as it is with canned fruits or vegetables. Fig. 2, Nos. 3 and 5, show two jars with improved screw-tops. These jars have a glass or porcelain top which is held in place by a metal band that screws down over the neck of the jar. This is a decided improvement on the old-style screw-top.

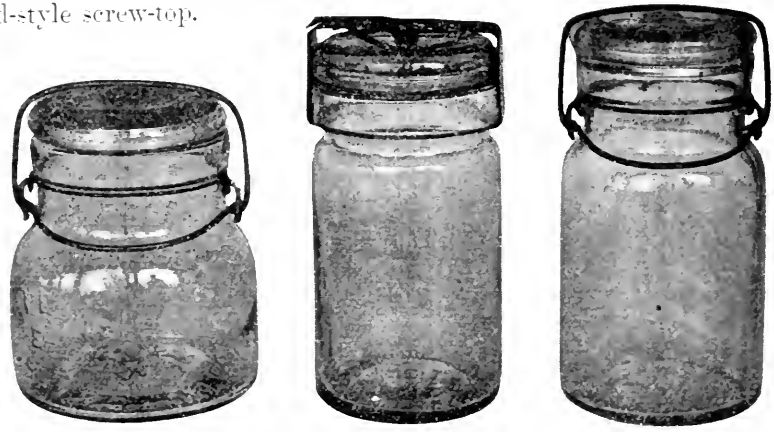


FIG. 3. Most satisfactory types of jars for general use.

The most satisfactory types of jars for general use are those shown in Fig. 3. This shows the original "Lightning Patent" small-mouth jar with glass top held in place by a wire spring; the "Safety-valve" type jar with similar top held in place by a lacquered metal band fitted with a spring and lever; and the improved wide-mouth "Lightning Patent" type jar with glass top held in place by a simple wire spring. The "Safety-valve" type jars are used by some commercial packers in canning the extra-fancy grades of fruit and vegetables. The wide mouth of the improved jar is a decided advantage when canning whole fruits or vegetables. Although jars of the types illustrated are a little more expensive, much more satisfactory and successful work can be done with them than with those having screw-tops. When buying jars, get as good a grade as can be afforded. The best quality usually retails at from $1 to $1.25 per dozen. The first expense may be somewhat high, but with reasonable care good jars should last many years.

RUBBERS.

The various types of jars are fitted with rubber rings on which the tops rest when in place. Rings are used to aid in sealing the jars and keeping them air-tight. After the contents of a jar have been sterilized, it is very necessary that the jar be kept air-tight in order that whatever is enclosed may remain sterile and free from the action of bacteria. Do not use rubbers the second time. The first season's cooking usually destroys the life or elasticity of the rubber. For this reason it is important that good fresh rubbers be used, as those used one season cannot be depended upon to make air-tight seals the second time. In buying rubbers, as in buying jars, get a good grade.

COMMERCIAL CANNING OUTFITS.

There are a number of outfits manufactured in different parts of the country with which excellent work can be done both for com-

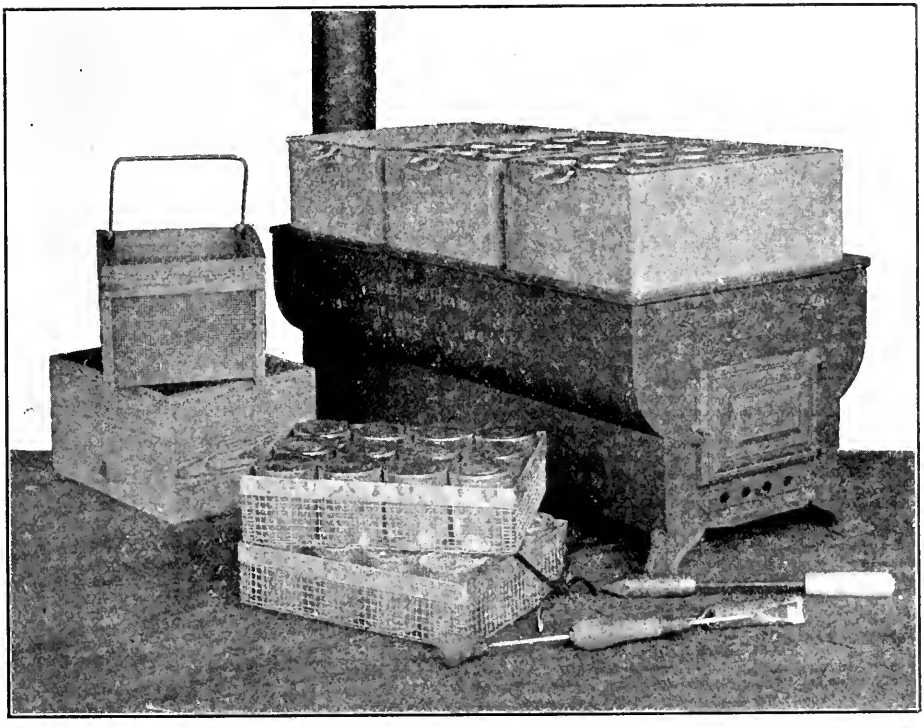


FIG. 4. Commercial canning outfit.

mercial purposes and for home use. These outfits range in size from those having a four 3-lb. can capacity to those having a

capacity of one hundred and thirty-two 3-lb. cans. The price varies accordingly from $5 to $100. Small outfits are intended for use on an ordinary cookstove or range, and are suitable for using either glass jars or tin cans. Medium-size outfits, both for commercial and home purposes, can be used either on a cookstove or on a simple furnace of bricks or stone. The larger outfits are principally intended for canning on a commercial scale, and are usually equipped with either portable furnaces or fire-boxes especially suited to the different ways of applying heat.

Manufacturers furnish catalogues having full descriptions and price-lists of their various outfits, cans and other equipment. They also send, with each outfit, a book of instructions, giving complete directions for preparing, packing and cooking the different fruits and vegetables. The following firms manufacture and sell canning outfits and supplies:

The Raney Canner Co.	Chapel Hill, N. C.
Modern Canner Co.	Chattanooga, Tenn.
Tharp Hardware and Mfg. Co.	Elkin, N. C.
F. S. Stahl Mfg. Co.	Quincy, Ill.
Home Canner Co.	Hickory, N. C.
Sprague Canning Machinery Co.	Chicago, Ill.
Robinson Can Co.	Baltimore, Md.
Dixie Hardware Mfg. Co.	Elkin, N. C.
The Champion Cannery Co.	Collinsville, Ala.
W. W. Wilson	Dallas, Tex.

HOME-MADE CANNING OUTFITS.

When canning fruits and vegetables simply for home use, it is not necessary to purchase an expensive or specially made vessel in which to do the cooking, although manufacturers of the various "Home-canning Outfits" have gotten out some very satisfactory utensils in which this work can be done. Any flat-bottom vessel, such as a wash boiler, ham boiler, preserving kettle or bucket, that is deep enough to permit of being covered after the jars or cans are placed inside, will serve the purpose. With whatever sort of vessel used, it is necessary to have what is known as a false bottom on which to set the jars or cans while cooking. Wire netting made of medium-size galvanized wire or narrow strips of wood, may be used for this purpose. If glass jars are set flat on the bottom of the vessel in which they are to be cooked they are apt to break during the heating. The vessel should also be equipped with a tight cover, prefer-

ably tin, to be kept in place while the cooking is being done. This cover retains a large part of the steam to aid in the cooking process. Fig. 5 shows a home-made outfit that can be used in this operation.

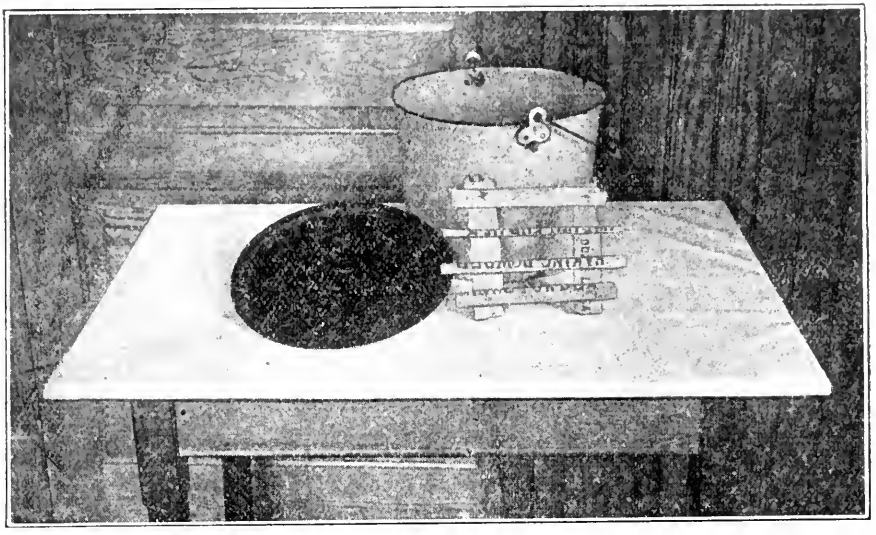


FIG. 5. Home-made canning outfit.

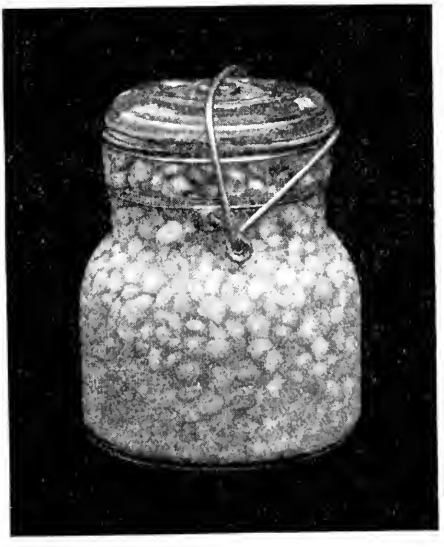


FIG. 6. Jar as placed in cooking vessel before being sealed tight.

COOKING IN GLASS JARS.

After fruits or vegetables are prepared for canning, pack them firmly in the jars to within about half an inch of the top and fill entirely full with fresh, clean, cold water. New rubbers are then put in place and the tops put on, but not sealed tight. (See Fig. 6.) The jars are then placed upon the strips of wood or other support

FIG. 7. Jars in vessel placed on stove ready for cooking.

on the bottom of the cooking vessel. This vessel is then filled with cold water to a depth that will bring it up two or three inches on the outside of the jars. The vessel is then placed on the stove ready for cooking to begin. (See Fig. 7.)

It is difficult to give absolute rules as to the exact time of boiling for each fruit and vegetable, from the fact that so much depends upon the ripeness and the variety. As a general rule, when canning fruits, let the water start to boil and continue boiling for ten minutes. At the end of this time seal the jar tight by screwing down the top or pushing down the spring, as shown in Fig. 8, and continue boiling for twenty minutes. In canning vegetables, let them boil fifteen minutes before sealing tight, and after that continue boiling forty-five minutes. With mixed vegetables, as corn and

beans, let them boil fifteen or twenty minutes before sealing tight, and after that continue boiling seventy-five minutes.

After the jars have been boiled the required time, remove them from the vessel, and set aside in some place where they will not be exposed to a draught. A draught of cold air coming in contact with

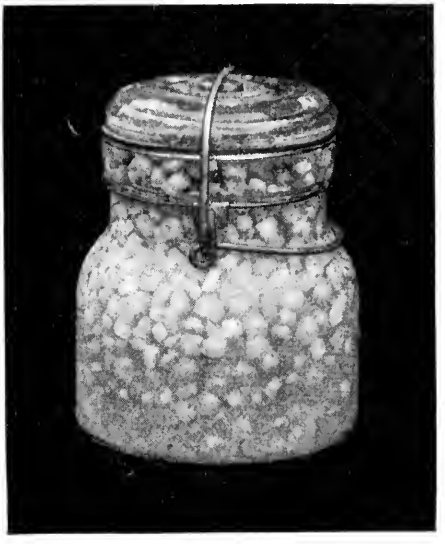


Fig. 8. Jar sealed tight.

the hot glass might cause some of the jars to break. Allow the jars to stand for twenty-four hours. At the end of that time again place them in the cooking vessel as on the first day. Fill the vessel with cold water, as directed on the preceding day, and boil fruit thirty

Fig. 9. Home-canned fruits and vegetables in different types of jars.

minutes, vegetables one hour, and mixed vegetables one hour and thirty minutes. After cooking the required time this second day, again remove jars as previously directed, and after standing another twenty-four hours again proceed to cook on the third day ex-

actly as directed for the second day. After jars have cooled from this third cooking they may be put in any convenient place and kept until wanted for use. Some products may retain their color better if kept in some darkened place out of the direct light. If no convenient place of this kind is handy, wrap the jars in dark paper. Always keep canned goods in a dry place. One point to be remembered in this method is that after the jars have once been sealed tight do not again loosen the top or unseal until the contents are to be used.

COOKING IN TIN CANS.

The same method employed in cooking in glass jars may be used with tin cans. Fruits and vegetables are firmly packed and the cans filled with clean cold water to within about a quarter of an inch of the top. The top or cap is then put on and held in position with a sharp stick or rod placed in the vent hole in the center of the cap. With a small brush or mop, moisten around the groove with soldering fluid. After placing a piece of solder in the groove, take the hot copper iron, wipe it on a damp cloth and place on the piece of solder, melting it. Run the copper smoothly around the groove. The solder will follow. See that the sealing has been smooth and complete, then proceed to cook as directed for glass jars. At the end of the first ten, fifteen, or twenty minutes boiling, as directed for the different fruits and vegetables on the first day, remove the cans and close the vents or holes in the center of the caps in the same way as the caps were soldered in place. Then place the cans back in the boiling water and proceed to cook as directed for glass jars.

ARTIFICIAL PRESERVATIVES.

Artificial preservatives in the form of "Acids," "Preserving Powders," and "Formulas" of various kinds are used in some localities in the preservation of foods. They are recommended by advertisements and agents as being perfectly harmless and are guaranteed to keep fruits and vegetables indefinitely. The object in using preservatives of any kind is to kill bacteria, thereby preventing fermentation and decay. Bacteria are minute forms of life of very delicate structure, and if these different preservatives act on the structure of bacteria in such a way as to kill them, what might be the effect of these same preservatives when brought in contact with the delicate structure inside the human body? Do not use artificial preservatives of any kind. The cheapest, surest and only absolutely safe way is to sterilize by means of heat applied in the form of cooking.

OPENING JARS.

Jars of fruit and vegetables are sometimes hard to open. Run a thin knife-blade under the rubber, next to the jar, and press against it firmly. This will usually let in enough air to loosen the top. If it does not, place the jar in a deep pan or kettle of cold water, heat to boiling point, and continue boiling for a few minutes. The jar will then open easily.

DIRECTIONS FOR COOKING IN GLASS JARS.

The following directions for canning apply only to pint-size jars. If quart jars are used, increase the time of boiling, making it one and one-half times that given for pints.

APPLES.

Acid varieties are best for canning. Select firm, well-ripened fruit. Peel and quarter, being careful to cut out all the core and all bruised or decayed specks. Pack firmly in jars and fill entirely full with fresh water. Use new rubbers, put tops on and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring water up about an inch or two on the outside of the jars. Put on cover, place on stove and bring to boiling point. Boil ten minutes, seal tight and continue boiling fifteen minutes. At the end of this time remove jars and let stand twenty-four hours. On second day, place in vessel as on first day and boil twenty-five minutes. Remove, let stand twenty-four hours, and cook on third day as directed for second day.

BLACKBERRIES.

Fruit should be ripe, but firm. Carefully remove all stems, leaves, trash, soft and imperfect berries. See that all fruit is clean. Pack firmly without mashing. Fill jars almost full and add four level tablespoons (about two ounces) of granulated sugar, then fill jars entirely full with fresh water. Use new rubbers, put tops on and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring water up an inch or two on outside of jars. Put on cover, place on stove and bring to boiling point. Boil five minutes, seal tight and continue boiling five minutes. Remove and let stand twenty-four hours. On second day place in vessel as on first day and boil ten minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

CHERRIES.

Fruit may be canned whole or seeded. Select sound, ripe fruit, remove all stems and trash. Pack firmly. Fill jars almost full and

add four level tablespoons (about two ounces) of granulated sugar, then fill jars entirely full with fresh, cold water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and bring to boiling point. Boil ten minutes, seal tight and continue boiling ten minutes. Remove jars and let stand twenty-four hours. On second day, place in vessel as on first day and boil twenty minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

FIGS.

Select firm, well ripened, freshly gathered fruit. Weigh, put in clean sack or wire basket, and boil five minutes. Drain fruit out and put in pans or granite kettles, a layer of figs and a layer of granulated sugar, using about one-half their weight of sugar. Let them stay in the sugar about seven hours or overnight, then heat. When all sugar is dissolved, pack fruit firmly in jars, using syrup to fill jars entirely full. Put on new rubbers, set tops in position, and place jars in cooking vessel. Fill vessel with water of about the same temperature as the jars, to a depth that will bring the water up two or three inches on the outside of the jars and bring to the boiling point. Boil ten minutes, seal tight and continue boiling ten minutes. Remove jars and let stand twenty-four hours. On second day, place in vessel as on first day and boil twenty minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

GRAPES.

Use firm, ripe fruit. Pick from stem, remove all trash, imperfect and soft fruit, and pack firmly. Fill jars full of fruit and add enough water to entirely fill jars. Use new rubbers, put tops on and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and bring to boiling point. Boil ten minutes, seal tight and continue boiling ten minutes. Remove jars and let stand twenty-four hours. On second day, place in vessel as on first day, and boil twenty minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

HUCKLEBERRIES.

Wash fruit in cold water. Pick out all stems, trash, small, imperfect and soft berries. Pack firmly without mashing fruit. Fill jars full and add enough cold water to entirely fill. Put on new rubbers, set tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two

or three inches on the outside of jars, cover, place on stove and bring to boiling point. Boil five minutes, seal tight and continue boiling ten minutes. Remove jars and let stand twenty-four hours. On second day, place jars in vessel as on first day, and boil fifteen minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

PLUMS.

Select firm, ripe fruit. Wash in clean, cold water. Remove stems and any trash. Pack firmly. Fill jars almost full and add four level tablespoons (about two ounces) of granulated sugar, then fill entirely full with fresh, cold water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on outside of jars, cover, set on stove and bring to boiling point. Boil ten minutes, seal tight and continue boiling ten minutes. Remove jars and let them stand twenty-four hours. On second day, place jars in vessel as on first day, and boil twenty minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

PEACHES.

Use firm, solid fruit, not too ripe. Peel, cut in halves and remove pits, unless fruit is to be canned whole. Pack firmly as soon as possible. Fill jars almost full and add eight level tablespoons (about four ounces) of granulated sugar, for a heavy syrup, and fill entirely full with cold water. Put new rubbers in place, set tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring water up two or three inches on the outside of jars, cover, put on stove and heat to boiling point. Boil ten minutes, seal tight and continue boiling ten minutes. Remove jars and let them stand twenty-four hours. On second day, place jars in vessel as on first day, and boil twenty minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day. If medium syrup be preferred, use six level tablespoons (about three ounces) of granulated sugar, and cook as directed. Small peaches and pieces not put in the jars of fancy fruit may be canned in light syrup and used for making pies. The fruit is prepared and cooked as directed, using four level tablespoons (about two ounces) of granulated sugar.

PEARS.

Fruit should be ripe, but not soft. Peel, cut in halves or quarter, cut out all core, bruised and decayed specks. Pack firmly. Fill jars almost full, add six level tablespoons (about three ounces) of granulated sugar, and fill entirely full with fresh, cold water. Use

new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and heat to boiling point. Boil ten minutes, seal tight and continue boiling fifteen minutes. Remove jars and let them stand twenty-four hours. On second day, place jars in vessel as on first day, and boil twenty-five minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

QUINCES.

Pare and quarter the fruit. Cut out all core, bruised and decayed specks and drop pieces in cold water until ready to pack in jars. Pack firmly. Fill jars almost full, add eight level tablespoons (about four ounces) of granulated sugar and fill entirely full with fresh, cold water. Put on new rubbers, set tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and heat to boiling point. Boil ten minutes, seal tight and continue boiling twenty minutes. Remove jars and let them stand twenty-four hours. On second day, place jars in vessel as directed on first day, and boil thirty minutes. Remove, let stand twenty-four hours, and on third day cook as directed for second day.

RASPBERRIES.

Handle fruit lightly. Select firm, ripe, well-colored berries. Remove all stems, leaves, trash, imperfect and soft fruit. Pack firmly, being careful not to mash berries. Fill jars almost full, add four level tablespoons (about two ounces) of granulated sugar, and fill entirely full with fresh, cold water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, put on stove and bring to boiling point. Boil five minutes, seal tight and continue boiling five minutes. Remove jars and set aside for twenty-four hours. On second day, place jars in vessel as on first day, and boil ten minutes. Remove jars, let stand twenty-four hours, and on third day cook as directed for second day.

RHUBARB.

Select stalks ready for use, wash clean and cut in pieces one to one and one-half inches long. Pack firmly. While filling jars add six level tablespoons (about three ounces) of granulated sugar. Fill jars full and add fresh, cold water to fill jars entirely full. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up

an inch or two on the outside of the jars, cover, place on stove and heat to boiling point. Boil ten minutes, seal tight, continue boiling ten minutes. Remove jars from vessel, set aside for twenty-four hours. On second day, place in vessel as directed on first day, and boil twenty minutes. Remove jars, set aside for twenty-four hours, and on third day cook as directed for second day.

STRAWBERRIES.

Select well-colored, firm fruit, free from sand or grit. Pick out all soft and imperfect fruit, caps, stems, and trash. Pack firmly, but do not mash fruit. Fill jars almost full, add four level tablespoons (about two ounces) of granulated sugar, and fill entirely full with clean, cold water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring water up an inch or two on outside of jars, cover, put on stove and heat to boiling point. Boil five minutes, seal tight and continue boiling five minutes. Remove jars, and let them stand twenty-four hours. On second day, place jars in vessel as directed on first day, and boil ten minutes. Remove jars, let stand twenty-four hours, and on third day cook as directed for second day.

VEGETABLES.

ASPARAGUS.

Cut as when preparing for market, having stalks of the proper length to fill the jars. Wash in fresh, cold water and pack firmly. Arrange stalks as uniformly as possible, having the tip-end up. After jar is filled in this way, take three or four stalks and force in center of jar, tip-end down. This helps to make the pack more firm. Put in one-fourth of a level teaspoonful of salt and fill jars entirely full with fresh, cold water. Put on new rubbers, set tops in position and place in cooking vessel. Fill vessel with cold water to a depth that will bring the water up an inch or two on the outside of jars, cover, put on stove and heat to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. At the end of this time, remove jars and set them aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour. Again remove jars and let stand twenty-four hours, and on the third day cook as directed for second day.

BEETS.

Young, tender, blood-red varieties are best. Boil in an open vessel until peeling comes off easily. Peel, slice, quarter or can whole, as desired. Pack firmly. Fill jars full and add fresh, cold water

until jars are entirely full. If a mild pickle is desired, take equal parts of water and vinegar, sweeten to taste, and fill jars with this mixture instead of water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up an inch or two on the outside of jars, cover, place on stove and heat to boiling point. Boil ten minutes, seal tight and continue boiling forty minutes. Remove jars, set them aside for twenty-four hours. On second day, place jars in cooking vessel as directed on first day, and boil fifty minutes. Again remove jars, set aside for twenty-four hours, and on third day cook as directed for second day.

BEANS (LIMA).

Carefully hull by hand, removing all discolored, broken and overripe beans. Can as soon as possible after shelling, as Lima beans lose their flavor very quickly after being shelled. Pack firmly. Fill jars to within half an inch of the top, add one-fourth teaspoonful of salt and fill entirely full with fresh, cold water. Put on new rubbers, set tops in position, and place in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and heat to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. Remove jars and set aside for twenty-four hours. On second day, place jars in cooking vessel as directed on first day, and boil one hour. Again remove jars and set aside for twenty-four hours, and on the third day cook as directed for second day.

BEANS (STRING, SNAP OR WAX).

Select freshly gathered pods about three-quarters grown. Carefully remove all strings and break or cut in pieces about one inch long. Put in a clean sack or wire basket and boil five minutes. Drain out and, after cooling a little, pack firmly. Fill jars almost full, add one-fourth level teaspoonful of salt and fill entirely full with fresh, cold water. Use new rubbers, put tops in position and place in cooking vessel. Fill this vessel and cook on each of three days exactly as recommended for Lima beans.

CORN.

Stowell's Evergreen, Country Gentleman, or any of the "sweet" varieties are best for canning. Use corn when in the milky state, before it has started to toughen and lose its sweetness. Corn should be canned as soon as possible after being gathered, for the amount of sugar in the sweet varieties diminishes very rapidly after the ear has been pulled from the stalk. Husk, and clean off as much silk as

possible. Cut the grains off with a sharp knife, being careful not to cut too close to the cob. Use the back of the knife to scrape the cob. Pack firmly. Fill jars to within half an inch of the top, add one-fourth level teaspoonful of salt and fill entirely full with fresh, cold water. Put on new rubbers, set tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and heat to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. At the end of this time remove jars from vessel and set aside for twenty-four hours. On second day, place in vessel as directed on first day, and boil for one hour. Again remove jars and set aside for twenty-four hours, and on third day cook as directed for second day.

HOMINY.

Use hominy made in the ordinary manner. Pack in jars, add salt and cold water, and cook in exactly the same way as for corn.

OKRA.

Gather young pods, wash in cold water, cut in short pieces and put in clean sack or wire basket, and boil for five minutes. Drain out and, after cooling a little, pack firmly in jars. Fill jars almost full, add one-fourth level teaspoonful of salt and fill entirely full with fresh, cold water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up about two or three inches on the outside of jars, cover, place on stove and heat to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. Remove jars, set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour. Remove jars, set aside for twenty-four hours, and cook on third day as directed for second day.

PEAS.

Select young, tender, well-grown peas. Shell from pods and, if canning for market, screen or sort into different sizes before packing. For home use this is not necessary. Put hulled peas in a clean sack or wire basket, and place in boiling water for five minutes. This shrinks the peas and turns the old and tough ones yellow, thereby making them easy to pick out. Pack firmly. Fill jars to within half or three-quarters of an inch of the top, add one-fourth teaspoonful of salt and fill jars entirely full with slightly warm, fresh water. Use new rubbers, put tops in position and place in cooking vessel. Fill vessel with cold water to a depth that will bring the

water up an inch or two on the outside of jars, cover, place on stove and bring to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. At the end of this time remove jars and set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour. Remove, set aside for twenty-four hours, and cook on third day as directed for second day.

PUMPKIN AND SQUASH.

After peeling, cut into small blocks or pieces of convenient size for packing. Pack firmly. Fill jars full and add fresh, cold water to fill jars entirely full. Put on new rubbers, set tops in position and place in cooking vessel. Fill vessel with cold water to a depth that will bring the water up two or three inches on the outside of jars, cover, place on stove and heat to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. Remove jars, and let stand twenty-four hours. On second day, again place jars in cooking vessel, as directed on first day, and boil one hour. Remove jars, set aside twenty-four hours, and on third day cook as directed for second day.

SPINACH.

Select quick-growing, crisp leaves. Wash thoroughly, removing all sand, grit, discolored leaves, and trash. Boil in some convenient pan or kettle about five minutes. Remove, drain and pack firmly in jars that have been tempered by being placed in warm water. Fill jars almost full, add one-fourth teaspoonful of salt, fill entirely full with warm water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with warm water to a depth that will bring the water up an inch or two on outside of jars, cover, place on stove and heat to boiling point. Boil ten minutes, seal tight and continue boiling thirty minutes. At the end of this time remove jars and set them aside for twenty-four hours. On second day, place jars in vessel as on first day, filling vessel with cold water instead of warm, and cook forty minutes. Remove, set jars aside for twenty-four hours, and cook on third day as directed for second day.

SWEET POTATOES.

Boil until skins will peel off and cut into pieces of convenient size for packing in jars. Pack firmly. Fill jars full without mashing, add sugar or salt to taste, and fill jars entirely full with cold, fresh water. Use new rubbers, put tops in position and place in cooking vessel. Fill vessel with cold water to a depth that will bring the water up an inch or two on the outside of jars, cover, place on stove and heat to boiling point. Boil fifteen minutes, seal tight

and continue boiling forty-five minutes. Remove jars, set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour. Remove jars, set aside for twenty-four hours, and on third day cook as directed for second day.

SQUASH.

Same as directed for Pumpkin.

TOMATOES.

Select firm, ripe, clean, well-colored tomatoes. Place in clean sack or wire basket and scald in boiling water for about a minute or until the skin slips easily. Remove skins and cut out all hard places, being careful not to break or mash. Save the juice that runs out when skinning and cutting tomatoes and use in place of water for filling jars. Pack firmly. Fill jars full and add enough juice to fill jars entirely full. Use new rubbers. Put tops in position and place jars in cooking vessel. Fill vessel with warm water to a depth that will bring the water up an inch or two on the outside of jars, cover, place on stove and bring to boiling point. Boil ten minutes, seal tight and continue boiling twenty minutes. Remove jars, set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil thirty minutes. Remove jars, set aside twenty-four hours, and on third day cook as directed for second day.

MIXED VEGETABLES AND SOUPS.

Sometimes there may be a few vegetables left over, not being enough of each to fill a jar. Combinations of certain vegetables make palatable mixtures that may be served as such, or made into soups.

CORN AND TOMATOES.

Use about one-third sweet corn and two-thirds tomatoes. Prepare each as directed under separate headings, mix and pack firmly. Fill jars to within half an inch of the top, add one-fourth teaspoonful of salt and fill jars entirely full with either tomato juice or fresh, cold water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water to a depth that will bring the water up an inch or two on the outside of jars, cover, place on stove and heat to boiling point. Boil fifteen minutes, seal tight and continue boiling forty-five minutes. Remove jars, set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour. Remove jars, set aside twenty-four hours, and cook on third day as directed for second day.

OKRA AND TOMATOES.

Use about one-half of each. Prepare each as directed under separate headings. Mix and pack firmly. Fill jars about full, add one-fourth teaspoonful of salt and fill jars entirely full with water. Use new rubbers, put tops in position and place jars in cooking vessel. Fill vessel with cold water and cook, on each of three days, exactly as directed for Corn and Tomatoes.

CORN AND BEANS (SUCCOTASH.)

Use one-half sweet corn and one-half of either Lima, Butter, Snap or Wax beans. Prepare each as directed under separate headings. Mix and pack firmly. Fill jars to within half an inch of the top, add one-fourth teaspoonful of salt and fill jars entirely full with fresh, cold water. Use new rubbers. Put tops in position and place in cooking vessel. Fill vessel with cold water to a depth that will bring the water up an inch or two on the outside of jars, cover, place on stove and bring to boiling point. Boil fifteen minutes, seal tight and continue boiling seventy-five minutes. Remove jars and set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour and a half. Remove jars, set aside twenty-four hours, and on third day cook as directed for second day.

SOUPS.

Various combinations of corn, beans, okra, tomatoes, turnips and carrots can be worked up and made into soup stock. Onion, celery, or cooked rice may be added to any of the different mixtures, as best suits the taste. In making any soup stock, select vegetables in the proportion desired and prepare each as directed under each heading, or as they would be prepared previous to cooking for immediate use. Pack firmly. Fill jars almost full, add salt to taste and fill jars entirely full with fresh, cold water or tomato juice. Use new rubbers, put tops in position and place in cooking vessel. Fill vessel with cold water to a depth that will bring the water up an inch or two on the outside of jars, cover, place on stove and bring to boiling point. Boil fifteen minutes, seal tight and continue boiling seventy-five minutes. Remove jars and set aside for twenty-four hours. On second day, place jars in vessel as directed on first day, and boil one hour and a half. Remove jars, set aside twenty-four hours, and on third day cook as directed for second day.

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. JUNE, 1910. Number 6.

THE CULTURE OF THE COWPEA.

COWPEAS IN ROWS.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, May 23, 1910.

SIR:—I submit in manuscript a report covering Fertilizer and Variety Experiments with Cowpeas on the Iredell Test Farm for the years 1903-'8 inclusive, together with a discussion of the results and their application to our farming conditions. B. W. Kilgore and C. B. Williams are responsible for the plans and conduct of the work 1903-'7; B. W. Kilgore and G. M. MacNider 1907-'8; F. T. Meacham had charge of the culture and handling of the crop; and W. C. Etheridge, E. L. Worthen and G. B. Walker did the main work in putting the results in tabular form. B. W. Kilgore is responsible for the form of the report, the conclusions, and the writing of it.

Similar reports with cotton and corn on the Iredell Farm and corn and cotton on the Edgecombe Farm will follow, the results already being in form for writing the report and drawing the conclusions.

The results presented in this report show, in a most striking way, the fertilizer requirements of the cowpea crop on certain soils, together with the varieties which can be grown at greatest profit for different purposes. The application of the fertilizer results, especially, will mean a large saving in the fertilizer bills of farmers growing this crop in the piedmont and mountain sections of the State.

I recommend the publication of this report as the June BULLETIN.

Respectfully,

B. W. KILGORE,
Director of Test Farms.

To HON. W. A. GRAHAM,
Commissioner of Agriculture.

THE CULTURE OF THE COWPEA.

Being a Report of Work with the Cowpea on the Iredell Test Farm in 1903-'8, Inclusive, and Including

I. FERTILIZER TESTS;

II. VARIETY TESTS;

III. CULTURE, FERTILIZATION AND USES.

By B. W. Kilgore, C. B. Williams, G. M. MacNider and F. T. Meacham.

SUMMARY.

1. The right fertilization of the cowpea pays handsomely. What this should be, together with the varieties which give best results for different purposes, is set forth in the following summary and pages.

2. The same fertilizers did not increase the yield of peas in the same proportions they did hay. The profits were therefore not as great from fertilizing peas for pea yields as for hay. It is to be remembered, however, that where there was an increased yield and profit from the use of fertilizers, the peas only were removed and the increased yield of hay was left on the land to increase its fertility. Taking these two factors into consideration—the yield of peas and improvement of soil from the extra growth of vines and stubble left on the land—the increase in yield and profits were the same.

3. For the production of hay, nitrogen alone, potash alone, and nitrogen and potash combined, produced small increases in the yields of hay over the plats receiving no fertilizer. For the production of peas these two constituents used alone and in combination with each other were at a loss.

On the whole, it may be, therefore, said that nitrogen alone and potash alone and nitrogen and potash combined with each other have little or no value in the growth of peas on this land.

4. For the production of hay, phosphoric acid alone produced decidedly increased yields at good profits. Nitrogen combined with phosphoric acid did not increase the yields over phosphoric acid

alone. Potash added to phosphoric acid gave small increases over phosphoric acid alone, while nitrogen and potash combined with phosphoric acid gave increases over phosphoric acid alone, but without profit. For the production of peas, phosphoric acid alone produced increased yields; nitrogen combined with phosphoric acid added slightly to the increase of phosphoric acid alone, as did potash also. Potash and nitrogen combined with phosphoric acid did not produce larger yields than nitrogen and phosphoric acid alone, showing that potash had but little effect in increasing the yield of peas.

The experiments show that phosphoric acid is the most important constituent for use on this soil in increasing the yield and adding to the profit in growing cowpeas.

5. The amount of nitrogen in the normal fertilizer (300 pounds per acre) used in the pea experiment was 1 per cent. Varying this amount from ½ per cent to 3 per cent did not, on the whole, taking the yield of peas and hay together, show any decided advantage for large amounts of nitrogen.

6. The amount of potash in the normal fertilizer (300 pounds per acre) application was 4 per cent. Increasing the amount of potash up to 9 per cent in the mixture gave, as a whole, a decrease in yields and profits. This further emphasizes the fact that this soil not only does not need potash in the growth of peas, but if added in large quantities it will be at a loss.

7. The amount of phosphoric acid in the normal fertilizer (300 pounds per acre) application was 8 per cent. Reducing this quantity by one-half and increasing it by two and three times the normal quantity, showed decided increases in the yields of both peas and hay for the larger quantities, emphasizing, in the most emphatic way, the need of this soil for phosphoric acid for the production of cowpeas. The most profitable yields on any of the plats were obtained from those receiving large amounts of phosphoric acid. The amounts of phosphoric acid in the mixtures which gave the largest profits varied between 342 and 514 pounds of 14 per cent acid phosphate.

8. Taken as a whole, the tests with lime did not show that this soil needs this constituent especially in the growth of peas.

9. Increasing the amount of the normal fertilizer application increased the yields and the profits, the best yields, on the whole, coming from the applications of 300 to 600 pounds.

10. Taking all the experiments into consideration, they show that this soil does not need potash for the most profitable production of peas and that large amounts decrease the yields.

11. Nitrogen has added but slightly to the yields, and there is no advantage in using it on this soil, when in fair to good condition.

12. Phosphoric acid is the most needed constituent on this soil. The analysis of the soil shows that it is very low in phosphoric acid. Field tests and chemical analysis of the soil are therefore in entire harmony in showing the need of this soil for growing peas.

13. The most profitable yields have been obtained from the use of 300 to 500 pounds of 14 per cent acid phosphate per acre, or 42 pounds to 70 pounds phosphoric acid.

14. In growing peas on the above land we advise the use of phosphoric acid alone, as stated above, 300 pounds acid phosphate being a good application and 500 pounds not too much. No potash-supplying material need be employed. In case the land is very poor, so that the peas do not start well at first, an amount of cotton-seed meal, dried blood, or other nitrogen-furnishing material may be added which will supply sufficient nitrogen to make 1 per cent nitrogen in the fertilizer mixture. Where 300 pounds and 500 pounds of 14 per cent acid phosphate respectively are used, 25 pounds and 42 pounds of blood will supply the necessary nitrogen. If it is discovered after the peas are planted and up that there is a need of nitrogen, as indicated by small, slow growth and pale, sickly appearance, a top dressing of 50 to 75 pounds of nitrate soda can be applied with profit.

15. Our soil analyses of the various type soils of the State and experiments on the Buncombe Test Farm indicate that these results will apply to the red (cecil) clay loams, red (cecil) clays and valley soils of the piedmont and valley and main upland soils of the mountain sections of the State. These soils constitute the main farming soils of the piedmont and mountain districts, and an application of the results will mean no small saving in the fertilizer bills of the farmers operating on these soils.

16. Thirty-one varieties of peas, embracing the main ones grown in this and adjoining States, as well as many of the less important ones, have been tested on the Iredell Farm during six years. The results obtained and observations reported include yields of peas, hay, time to mature peas and hay, and character of growth of plant. For the varieties grown four years or more the following average data were obtained:

17. The average yield of peas varied from 6.6 bushels to 13.5 bushels per acre, the rank in order of productiveness being as follows:

Whittle,
Small Black,
New Era,
Whippoorwill,
Sixty-day,
Red Crowder,
Southdown,
Iron,
Large Black Eye,
Powell's Early Prolific,
Small Black Eye,
Small Lady,
Red Ripper,
Yellow Sugar Crowder.

The number of seed per pound varied from 1,814 with the Large Black Eye to 3,856 with the Iron. This is a measure of the size of the peas and is a factor which is of interest in determining the quantity of peas to be planted per acre.

18. The yield of hay varied from 2,400 to 3,872 pounds for the varieties tested four years and over, the rank in order of productiveness being as follows:

Iron,
Clay,
Brown Coffee,
Whippoorwill,
Red Crowder,
Red Ripper,
Yellow Sugar Crowder,
Small Black,
Whittle,
Southdown,

New Era,
Small Lady,
Powell's Early Prolific,
Small Black Eye,
Large Black Eye.

To this should be added that the largest yield of hay from any of the varieties was from the Unknown, the average for three years being 5,200 pounds, or 2.6 tons.

19. For both peas and hay, the following are shown to be excellent kinds:

Whippoorwill,
Red Crowder,
Iron,
New Era.

20. For soil improvement the varieties which produce the largest yields of hay and peas combined are best and the following varieties are specially desirable for this purpose:

Unknown,
Iron,
Clay,
Brown Coffee,
Whippoorwill,
Red Crowder,
New Era.

21. The cowpea will thrive under unfavorable conditions of soil preparation. It is, however, a plant that responds most readily and profitably to thoroughly deep breaking and pulverization of the land. This permits deep and large root development and allows good circulation of the air, which together enable the plant to obtain the maximum of nitrogen from the air for its growth and for storing in the soil for improvement and the use of future crops.

22. When sown broadcast or drilled with grain drill, one bushel of peas makes a good seeding. Our experiments show that when planted in 3⅓-foot rows, one half-bushel produces practically as large yields as 1½ bushels per acre. When planted in rows it pays to cultivate two to three times.

23. Cowpea-vine hay has a feeding value practically equal to that of wheat bran, which is worth now more than $30 per ton. Animals do not eat up the hay as clean as the wheat bran, there

being some waste. If the hay was ground, as it is entirely possible to do, as alfalfa now is on a large scale, the ground pea-vine hay should sell as readily as wheat bran, as it has as large value for feed as wheat bran.

24. A ton of pea-vine hay removes from the soil in round numbers 47 pounds nitrogen, 10 pounds phosphoric acid, and 29 pounds potash, worth at present prices for fertilizer constituents $10.56. The yield of pea-vine hay on fair to good land is from one to three tons per acre, according to season and variety of peas planted. This shows its high value for soil improvement. It is possible to get the feeding value and in returning the manure to the soil to save a large part of the fertilizing value, provided the manure is well handled.

25. Around 85 per cent of the fertilizing and soil improving value of the cowpea crop is contained in the hay and 15 per cent in roots and stubble. Where the improvement of the land is the sole or main object the entire crop should be left on the land, as otherwise the soil might be reduced in productiveness if good and judicious fertilization is not followed.

26. On heavy land small crops of peas may be turned under green and improve the physical condition of the soil, in addition to adding the fertilizer constituents contained in the crop. On light soils it is likely best to allow the vines to die and partially decay on the soil and turn under during the winter or early spring. This is good practice on all kinds of land and especially with large crops. Any loss from remaining on the land during the fall and winter will likely be overcome by the prevention of washing. Where it is desired to use the land in the fall for small grain the peas may be cut up with a disk harrow or other implement and allowed to wilt and dry on the soil and then be turned under. If this can be done some time in advance of planting, so as to allow the rains to settle the soil or else do so by harrowing and rolling, good results will follow.

I. FERTILIZER TESTS OF COWPEAS.

The cowpea is the most important Southern soil-improving crop. Its value for soil improvement, for hay and for other purposes has long been understood and appreciated by farmers throughout the South. The suitability and adaptability of the different varieties, of which there are a large number, to the different sections of the country, are not well known, and results upon which to base intelligent ideas of fertilization which will give best results with the crop on different soils are quite limited, and in most cases entirely lacking. Our Test Farms were established in different sections of the State and on different type soils for the purpose of obtaining information of this kind. The following extract from our first report in 1900 on Test Farm work is of interest in this connection:

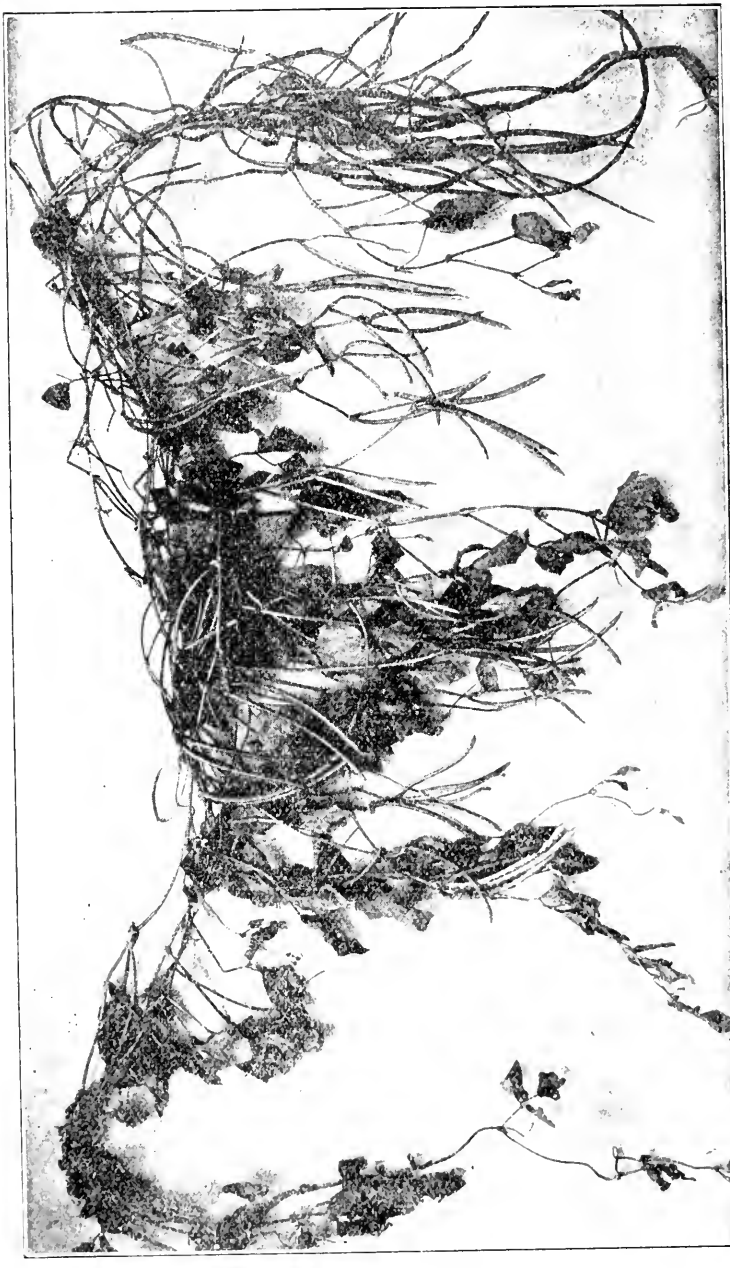
"There is justly much doubt in the minds of farmers as to whether or not they are using the fertilizer and the quantity of that fertilizer best suited to give them the most profitable results. There are quite a number of types of soil in the State, each one of which represents a considerable area. These different kinds of soil likely differ in their fertilizer requirements. The various classes of plants grown on them certainly do. The only thoroughly practical way of determining the proportions of nitrogen (or ammonia), phosphoric acid and potash, that are best suited to the different crops and soils, as well as the most profitable amounts of these valuable fertilizer constituents to use, is to actually grow the crops on the particular soil in question, and apply varying quantities of nitrogen, phosphoric acid, and potash in the materials which supply them. By doing this, and giving the areas with different amounts of fertilizers the same treatment during the growing season, and submitting the yields to the careful test of the balance, nature gives the answer desired. This is the practical as well as the scientific way of dealing with this and like subjects—going direct to the soils and plants, and making known our wants in such a way as to induce them to give the most intelligent answers as to what they need to do the best service for man.

"To be of value, work of this kind must be carefully done, and this requires skill and experience with soils, plants and fertilizers, and, in addition, costs some money. But the farmer's outlay for fertilizers, as well as his need and desire to use them in the best and most economical way, not only justifies, but calls for the conduct of this kind of work."

WORK REPORTED.

On the following pages are recorded the results of five years' fertilizer experiments with cowpeas and six years of tests of our main varieties, on the Iredell Test Farm of this Department, extending through the years 1903-1908, both inclusive. The work is being continued to collect further data along these lines, as well as to obtain information as to the value of the crop in rotation with other crops, for soil improvement and for other purposes.

Considerable data, of a more or less technical nature, is not published here, but is reserved for future use. This relates especially to the composition of the different varieties, the relative proportion of the different parts, as peas, stalks, leaves and stubble, and bears especially on the comparative values of the different varieties for soil improvement.



A COWPEA PLANT.

LOCATION OF FARM AND CHARACTER OF SOIL.

The Iredell Test Farm is located near Statesville, in Iredell County, well up in the Piedmont (foothill) section of the State, the elevation being 950 feet above sea-level. The main type of soil on the farm is red (cecil) clay loam, the subsoil being a moderately heavy clay, but the surface soil has sufficient sand in it to make it a clay loam rather than a clay, though when freshly plowed it would to a casual observer be looked upon as red clay. The main types of soil in the piedmont are cecil sandy loam (gray land), red clay (cecil) loam, red (cecil) clay, the latter two being the predominating types. The clay and clay loam types are rich in potash, the clay containing more potash than the loam, very poor in phosphoric acid, the amount of nitrogen depending on the organic matter in the soil. Samples of soil from the unfertilized plats, on which the experiments were conducted, contain the following amounts of plant food:

Nitrogen (N)	.075 per cent.
Phosphoric Acid (P_2O_5)	.041 per cent.
Potash (K_2O)	.553 per cent.
Lime (CaO)	.396 per cent.

THE PLATS.

The plats on which these experiments were conducted were embraced in Fields A and C. Field A had been long in cultivation and was badly run down when work was started in 1903. The plats were laid off in two series parallel to each other, there being twenty plats to the series, with a driveway and turn-row between plats. The plats are one-tenth acre in size, or 217.8 feet by 20 feet, with space between plats sufficient for two rows of peas or other crops, the row on either side of each plat being fertilized like the plat which it adjoins. These plats were used for fertilizer experiments with cotton in 1903, 1904, 1906, and for fertilizer experiments with corn in 1905 and 1907; for general crop of oats without fertilizer in the fall and spring of 1908, and for fertilizer experiments with peas, the results of which are here reported, in 1908. In the case of each of the three crops the same plan or system of fertilization was followed. By this is meant that Plat One in all cases received only nitrogen; Plat Two, phosphoric acid; Plat Three, potash, and so on, though the quantities actually applied varied with the three crops. The fertilization of the cotton plats was based on a normal application of 400 pounds per acre of a mixture containing 7 per cent available phosphoric acid, 2½ per cent each of nitrogen and potash. The fertilization for corn was based on 300 pounds per acre of a mixture containing 7 per cent phosphoric acid, 3 per cent nitrogen, and 1½ per cent potash.

The plats embraced in Field C were part of an old field covered with broomsedge, small briars, and small pines in 1903. The pines were grubbed out and the other growth turned under with a two-horse plow in the spring of 1903 and cultivated in corn that year, with a fertilizer application of 300 pounds per acre of the composition referred to above for corn. In the fall of 1903 crimson clover was sown, but no stand was obtained. The land was prepared in the spring of 1904 and laid off in plats of one-twentieth acre each, the size being 108.9 feet by 20 feet, with space between the plats for two rows of peas, the row nearest the plats being fertilized in each case like the plats they adjoined. There is a four-foot space at the end of the plats, which was not counted, and a turn-row between the series, there being two series with sixteen plats in each series. In the case of all the plats on this farm there is a four-foot extra space at the ends of plats.

The results were obtained by dividing the plats in half, cutting one-half for hay to obtain the yield of hay, and picking the peas on the other half for yield of peas. The pea yields in all cases are expressed as bushels—dried shelled peas.

PREPARATION AND CULTIVATION.

The land in all cases was well prepared by breaking with a two-horse turning plow to a depth of eight to ten inches, cut up thoroughly with disk harrow, double disking when necessary, and then harrowing with iron spike-tooth smoothing harrow. In both fertilizer and variety tests the rows were run off 3⅓ feet apart, and in the case of fertilizer tests the fertilizer materials were weighed out separately for each row, distributed in the drill and mixed with the soil. The peas were drilled at the rate of as nearly 30 pounds per acre as possible, using the pea plate and Hoosier Planter. The New Era variety of peas was used in all the fertilizer tests. The peas were cultivated two to four times each season, depending on the time of planting and the need of cultivation. When planted early more cultivation was required than for late planting, to keep down weeds and grass. The cultivations were with Planet Junior or riding cultivators, going usually once to the row.

The time of planting and number of cultivations for each season in the fertilizer experiments were as follows:

1904.—Land was broken in the fall and again in the spring and planted on June 3d. Peas were cultivated four times; June 18th, 25th, July 8th, 22d.

1905.—Land was broken July 2d, planted on the 7th, and cultivated only once, which was on July 24th. Wet weather prevented further cultivation.

1906.—Land was broken June 11th, planted June 22d, and cultivated three times—July 11th and 28th and August 13th.

1907.—Land was broken June 22d, planted July 2d, and cultivated three times—July 23d, August 2d and 13th.

In 1905, 1906, 1907 the peas followed wheat; in 1904 there was no preceding spring crop, but corn was on the land in 1903.

1908.—Land was broken July 11th, planted on the 15th, and cultivated three times—July 28th, August 18th, and September 3d. The peas this year followed oats.

FERTILIZATION AND FERTILIZER MATERIALS USED.

As already stated, fertilizer was applied in the drill just before planting, the exact quantity of material for each row being weighed out separately, so that each row would get its proper amount of the several fertilizer constituents. Acid phosphate was used as the source of phosphoric acid; dried blood as the source of nitrogen; manure salt as the source of potash, and rock or building lime for lime. The fertilizer materials were analyzed each year and the applications made on basis of these analyses, so as to give the exact quantities of nitrogen, phosphoric acid and potash required for each plat. For the sake of simplicity and convenience in presenting the results of a number of years' experiments, the fertilizer applications are expressed in terms of acid phosphate containing 14 per cent available phosphoric acid, dried blood containing 13 per cent nitrogen, and manure salt containing 20 per cent potash, which figures represent the average composition of these materials. The fertilizer applications in the fertilizer experiments are on basis of 300 pounds per acre (for the normal plat N P K) of a mixture containing 8 per cent available phosphoric acid, 4 per cent potash, and 1 per cent nitrogen. Lime is applied at the rate of 500 pounds rock or building lime, or 1,000 pounds slaked lime. The fertilizer applications in the table, in addition to being represented in terms of acid phosphate, dried blood, and manure salt, are also expressed in terms of the symbols, N P K and L, which have the following significance:

N equals or represents nitrogen at the rate of 3 pounds per acre, or 23 pounds of 13 per cent dried blood;

P represents phosphoric acid at the rate of 24 pounds per acre, or 171.4 pounds of 14 per cent acid phosphate;

K represents potash at the rate of 12 pounds potash per acre, or 60 pounds 20 per cent manure salt;

L equals lime at the rate of 500 pounds rock, unslaked lime or 1,000 pounds slaked lime per acre.

There are columns in the tables showing the exact weights in pounds of phosphoric acid, potash and nitrogen applied to each

plat (expressed on acre basis), which will enable any one to use these same amounts of fertilizer constituents in other materials if desired. The following average prices which fairly represent the cost of the several materials to the farmer for the period under experimentation have been assumed for the materials used:

14 per cent Acid Phosphate	$14.00 per ton.
13 per cent Dried Blood	60.00 per ton.
20 per cent Manure Salt	20.00 per ton.
Rock Lime	10.00 per ton.

The arrangements of the plats and the scheme of fertilizer application is shown by the following:

Normal Fertilizer Application, 300 pounds to acre of mixture containing—

Phosphoric Acid	8 per cent.
Potash	4 per cent.
Nitrogen	1 per cent.

In this Normal Application—

P equals 24 pounds phosphoric acid, equals 171.4 pounds 14 per cent acid phosphate;

K equals 12 pounds potash, equals 60 pounds 20 per cent manure salt;

N equals 3 pounds nitrogen, equals 23 pounds 13 per cent dried blood.

SIZE OF PLATS, ONE-TWENTIETH ACRE (108.9 x 20 FEET).

First Series:

Plat.	*Application.*		
1	N		
2	P		
3	K		
4	N	P	
5	N	K	
6	N	P	K
7	N½	P	K
8	O		
9	N_2	P	K
10	N_3	P	K
11	N	P½	K
12	N	P_2	K
13	N	P_3	K
14	N	P	K½
15	N	P	K_2
16	N	P	K_3

Second Series:	*Application.*			
1	$1\frac{1}{2}$ (N	P	K)	
2	$1\frac{1}{2}$ (N	P	K)	
3	2 (N	P	K)	
7	Lime			
9	N	P	K	L
10	P	K_2		
11	P	K_3		
12	P	K		
13	P_2	K		

The above represents the plats in Field C. The plats in Field A are arranged in a similar way.

WEATHER CONDITIONS DURING 1903-'08, INCLUSIVE.

Besides soil, fertilization, cultivation, and time of planting, weather conditions, mainly the rainfall, influence the crop yield. In the table presented herewith will be found the monthly and annual rainfall during the years covered by the experiments, the mean monthly and annual rainfall since 1868 and the same data for the months of June to September, inclusive, and July to August.

RAINFALL IN INCHES AT STATESVILLE.

	1903.	1904.	1905.	1906.	1907.	1908.	Means of Observations Since 1868.
January	6.43	2.07	2.88	7.23	0.05	4.20	3.98
February	9.90	3.87	5.70	1.75	2.16	3.90	4.57
March	8.66	2.46	1.50	6.00	2.75	3.80	5.15
April	7.37	1.55	2.28	1.49	3.85	3.10	3.67
May	.63	2.07	6.78	2.02	3.02	2.04	3.96
June	4.52	5.74	1.28	6.45	4.74	1.55	4.36
July	3.55	4.01	8.95	8.68	2.02	9.33	4.81
August	3.04	6.60	8.75	6.37	3.26	13.27	5.82
September	5.05	1.31	1.30	3.61	6.05	3.75	4.19
October	1.08	0.12	2.06	4.11	1.60	8.15	3.23
November	1.72	3.71	0.35	0.80	4.00	1.90	2.98
December	1.69	3.64	8.09	2.80	6.22	4.60	4.37
Annual	53.64	37.15	49.91	51.31	39.66	59.59	51.09
Average for June to September, inclusive	4.04	4.41	5.07	6.28	4.02	6.97	4.79
Average for July and August	3.29	5.30	8.85	7.52	2.64	11.30	5.31

EFFECT OF TIME OF PLANTING AND RAINFALL ON YIELDS.

In the fertilizer experiments, with the exception of the first year (1904), when the planting was made early in June, the plantings were made from the last of June to the middle of July. This would make July and August the most important growing months for the pea crop in these experiments. The larger yields in 1904 over other

years are due, in part, at least, to earlier planting, which gave about one month's longer growing period, and to the favorable rainfall, which was just about normal. In 1905 and 1906 the seasons were wet, while in 1907 there was only about one-half the normal rainfall in July and August. This would account for the very low yields in that year. 1908 was an excessively wet year.

THE RESULTS.

An examination of the yields on the plats in Field C will show that there was a decrease in yields for each of the four years. This is due, in part, to weather conditions and time of planting already referred to. In 1904 the pea crop had the land throughout the entire growing season and without the draft of a previous crop on the available plant food in the soil. After 1904 a grain crop preceded the pea crop, a crop of each being produced each year. It may be possible that the land was tired of peas, or that it was "pea-sick," as is now and then spoken of in connection with other crops. The inference that such was the case would be very strong were it not for the other conditions influencing the yields, which have already been referred to, and which must be considered. The results which will follow in the next few years will be interesting in this connection. That the land is really in better condition for growing other crops is shown by the yields of cotton and corn on these plats, they having been in cotton in 1908 and corn 1909. The results of these two crops on plats having the same fertilization show greater increases over unfertilized plats than were obtained on the plats where corn and cotton have been grown in rotation with each other, and where the type of soil is the same.

The experiments were planned to cover the culture and fertilization of the cowpea as a whole, but the results of the several subdivisions of phases of the subject are grouped in short tables to facilitate examination and the drawing of conclusions, after which they will be considered as a whole and general conclusions drawn for the fertilization of the crop on this type of soil.

TABLE I—YIELDS OF PEA-VINE HAY OBTAINED IN FERTILIZER EXPERIMENTS WITH COWPEAS IN FIELD C, IN 1904, 1905, 1906, 1907.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Hay in Pounds per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Hay in Pounds per Acre.	Average Increase of Hay in Pounds per Acre Due to Fertilizer.	Value of Increase in Hay at $15 00 per Ton.	Cost of Fertilizer per Acre.	Value of Increase Over Cost of Fertilizer.
1	23 pounds 13% blood=.....N=	3	.....	.....	4,200	3,200	1,060	400	.....	2,215	475	$ 3.56	$ 69	$ 2.87
2	171.4 pounds 14% acid phosphate=.....P=	.....	24	.....	3,600	4,000	1,440	800	.....	2,460	720	5.40	1.20	4.20
3	60 pounds 20% manure salt=.....K=	.....	.....	12	2,880	3,600	1,080	760	.....	2,080	340	2.55	.60	1.95
4	23 pounds 13% blood=.....N= 171.4 pounds 14% acid phosphate=.....P=	3	24	.....	3,200	3,200	1,500	900	.....	2,200	460	3.45	1.89	1.56
5	23 pounds 13% blood=.....N= 60 pounds 20% manure salt=.....K= 171.4 pounds 14% acid phosphate=.....P=	3	24	12	3,120	3,000	1,120	890	.....	2,032	292	2.19	1 29	.90
12[2]	60 pounds 20% manure salt=.....K= 171.4 pounds 14% acid phosphate=.....P=	.....	24	12	4,320	4,200	1,400	960	.....	2,700	840	6.30	1.80	4.50
6	23 pounds 13% blood=.....N= 171.4 pounds 14% acid phosphate=.....P= 60 pounds 20% manure salt=.....K=	3	24	12	4,200	3,600	1,968	1,040	.....	2,702	962	7.21	2.49	4.72
8	Unfertilized=.....O=	.....	.....	.....	2,720	2,400	1,120	720	.....	1,740	.....	.....	.....	.....
8[2]	Unfertilized=.....O=	.....	.....	.....	3,600	2,200	1,120	600	.....	1,880	.....	.....	.....	.....

RESULTS IN 1908 ON FIELD A.

1	23 pounds 13% blood=.....N=	3	.....	.....	.....	.....	.....	.....	400	.....	.....	$.....	$ .69	$*—.69
2	171.4 pounds 14% acid phosphate=.....P=	.....	24	.....	.....	.....	.....	.....	2,100	.....	1,700	12.75	1 20	11.55
3	60 pounds 20% manure salt=.....K=	.....	.....	12	.....	.....	.....	.....	400	.....	.....	.....	.60	*—.60
4	Unfertilized=.....O=	.....	.....	.....	.....	.....	.....	.....	400	.....	.....	.....	.....	.....
5	23 pounds 13% blood=.....N= 171.4 pounds 14% acid phosphate=.....P=	3	24	.....	.....	.....	.....	.....	2,200	.....	1,800	13.50	1 89	11 61
6	23 pounds 13% blood=.....N= 60 pounds 20% manure salt=.....K=	3	.....	12	.....	.....	.....	.....	900	.....	500	3.75	1.29	2.46
7	171.4 pounds 14% acid phosphate=.....P= 60 pounds 20% manure salt=.....K=	.....	24	12	.....	.....	.....	.....	2,300	.....	1,900	14.25	1.80	12 45
8	23 pounds 13% blood=.....N= 171.4 pounds 14% acid phosphate=.....P= 60 pounds 20% manure salt=.....K=	3	24	12	.....	.....	.....	.....	2,200	.....	1,800	13.50	2.49	11.01
11	Unfertilized=.....O=	.....	.....	.....	.....	.....	.....	.....	400	.....	.....	.....	.....	.....

*Loss.

The experiments above were planned to test the effect on yield of nitrogen (N), phosphoric acid (P), and potash (K) when applied singly; when two of the constituents were applied together, as nitrogen and phosphoric acid (N P), nitrogen and potash (N K), and phosphoric acid and potash (P K), and when all three of the fertilizing constituents were applied to make a complete fertilizer (N P K).

The results are shown in yields of hay in pounds or peas in bushels per acre for the several years, average yields, average increases over the unfertilized (O) plats, which represent the effect of the fertilizer applications, the value of the increase, the cost of the fertilizer, and the value of the increased yield over cost of fertilizer.

EFFECT ON YIELDS OF HAY.

Nitrogen, N (plats 1 and 1). From nitrogen alone in Field C there were increased yields of hay in 1904 and 1905 and decreases in 1906 and 1907 over the unfertilized plat (8), the average increase being 475 pounds, while in 1908 in Field A the plat (1) receiving nitrogen and the unfertilized plat (4) produced the same yield. Plat 1 had had an application of nitrogen alone in corn and cotton tests during the previous six years and plat 4 had had no fertilizer during the same time.

Phosphoric Acid, P (Plats 2 and 2). Phosphoric acid alone produced increased yields in all of the five years on the plats in both fields, the average for the first four years being 720 pounds of hay, and for the fifth year in Field C 1,700 pounds, worth at $15 per ton respectively $4.20 and $11.55 over the cost of fertilizer.

Potash, K (Plats 3 and 3). From potash alone in Field C the yields increased in 1904, 1905, and 1907, and decreased in 1906, the average annual increase being 340 pounds of hay. In Field A there was no increase due to potash in 1908 and the fertilizer application was a loss.

Nitrogen and Phosphoric Acid, N P (Plats 4 and 5). Phosphoric acid and nitrogen combined gave increased yields over the unfertilized plats in all five years on the plats in both fields, the annual average for the first four years in Field C being 460 pounds of hay (less than for phosphoric acid alone, which was 720 pounds). For the fifth year (1908) in Field A the increase was 2,200 pounds, or 100 pounds more than the phosphoric acid alone gave.

Nitrogen and Potash, N K (Plats 5 and 6). From the application of nitrogen and potash combined the yields were increased in three years and gave the same yield in one year in Field C, the average increase for the four years being 292 pounds of hay, the smallest increase from any of the applications in the test. In Field A in 1908 there was a gain of 500 pounds of hay, due to potash and nitrogen.

Phosphoric Acid and Potash, P K (Plats 12[2] and 7). Phosphoric acid and potash combined produced increased yields of hay in all five years of the tests on the plats in both fields over the unfertilized plats, the annual average for the first four years in Field C being 840 pounds per acre (120 pounds more than phosphoric acid alone), and for the fifth year (1908) in Field A 1,900 pounds (200 pounds more than phosphoric acid alone), valued over the cost of fertilizer respectively at $4.50 and $12.45 per acre.

Phosphoric Acid, Potash and Nitrogen, N P K (Plats 6 and 8). These three materials combined in a complete fertilizer gave increased yields in all of the tests on all the plats, the annual average for the four years in Field C being 962 pounds of hay and for the fifth year in Field A 1,800 pounds. The net value of the increase (value over the cost of fertilizer) was $4.72 in Field C and $11.01 in Field A, or 52 cents more than phosphoric acid in Field C and 54 cents less in Field A.

For the production of hay these experiments, as a whole, show that phosphoric acid (acid phosphate) produced the increased yields and that nitrogen and potash had very little effect, and in a number of tests none at all.

TABLE II—YIELDS OF PEAS OBTAINED IN FERTILIZER EXPERIMENTS WITH COWPEAS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Peas in Bushels per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Peas in Bushels per Acre.	Average Increase in Bushels of Peas Due to Fertilizer.	Value of Increase in Peas at $1.00 per Bushel.	Cost of Fertilizer per Acre.	Value of Increase in Peas Over Cost of Fertilizer.
1	23 pounds 13% blood=N	3			20.3	11.0	3.3	1.0		8.9	1.4	$ 1.40	$ .69	$ .71
2	171.4 pounds 14% acid phosphate=P		24		22.3	16.5	7.5	2.8		12.3	2.0	2 00	1.20	.80
3	60 pounds 20% manure salt=K			12	16.7	12.3	7.0	4.3		10.1	—0.2	— .20	.60	*—.80
4	23 pounds 13% blood=N 171.4 pounds 14% acid phosphate=P	3	24		23.0	14.0	10.0	6.7		13.4	3.1	3.10	1.89	1.21
5	23 pounds 13% blood=N 60 pounds 20% manure salt=K	3		12	18.5	10.8	7.0	4.8		10 3			1 29	*—1.29
12[2]	171.4 pounds 14% acid phosphate=P 60 pounds 20% manure salt=K		24	12	24.5	11.8	8.0	4.1		12.1	2.5	2.50	1.80	.70
6	23 pounds 13% blood=N 171.4 pounds 14% acid phosphate=P 60 pounds 20% manure salt=K	3	24	12	24.5	12.3	7.6	7.0		13.4	3.1	3.10	2.49	.61
8	Unfertilized=O				17.8	11.5	7.0	4.7		10.3				
8[2]	Unfertilized=O				16.3	10.2	8.0	4.0		9.6				

RESULTS IN 1908 ON FIELD A.

1	23 pounds 13% blood=N	3							3.0		0.1	$ .10	$ .69	$ *.79
2	171.4 pounds 14% acid phosphate=P		24						7.9		5.0	5.00	1.20	3.80
3	60 pounds 20% manure salt=K			12					1 4		—1.5	—1.50	.60	*2.10
4	Unfertilized=O								2.9					
5	23 pounds 13% blood=N 171.4 pounds 14% acid phosphate=P	3	24						9.83		7.20	7.20	1.89	5.31
6	23 pounds 13% blood=N 60 pounds 20% manure salt=K	3		12					1.83		— .50	— .50	1.29	*—1.79
7	171.4 pounds 14% acid phosphate=P 60 pounds 20% manure salt=K		24	12					9.0		6.97	6.97	1.80	5.17
8	23 pounds 13% blood=N 171.4 pounds 14% acid phosphate=P 60 pounds 20% manure salt=K	3	24	12					8.33		6.60	6.60	2.49	4.11
11	Unfertilized=O								.83					

*Loss.

PEAS.

The yields of peas presented in the above table (11) were obtained on the same plats as the hay in Table 1, the hay being cut on one-half of each plat and the peas gathered on the other half.

Nitrogen, N (Plats 1 and 1). After the first year (1904) nitrogen alone gave no material increase in the yield of peas; in two years (1906 and 1907) there was a decided decrease.

Potash, K (Plats 3 and 3). Potash alone did not increase the pea yields, the net result being a small loss in yields and the loss of the cost of the fertilizer application.

Nitrogen and Potash, N K (Plats 5 and 6). Nitrogen and potash combined did not help the yield of peas, and the cost of the fertilizer was lost.

Phosphoric Acid, P (Plats 2 and 2). Phosphoric acid alone gave an annual average increase of 2 bushels of peas per acre for the four years' test in Field C and 5 bushels for the fifth year in Field A.

Nitrogen and Phosphoric Acid, N P (Plats 4 and 5). Phosphoric and nitrogen combined increased the yield of peas in each of the tests, the annual average for the four years in Field C being 3.1 bushels, and for the fifth year in Field A 7.2 bushels. These were the largest and most profitable increases obtained from any of the fertilizer applications.

Phosphoric Acid and Potash, P K (Plats 12^2 and 7). From phosphoric acid and potash together there was an average annual increase of 2.5 peas per acre for the four years in Field C, and 7 bushels for one year in Field A.

Nitrogen, Phosphoric Acid and Potash, N P K (Plats 6 and 8). These three materials in a complete fertilizer produced an average increase of 3.1 bushels for the four years in Field C, the main increase being the first two years, and 6.6 bushels for the fifth year in Field A. The yields above were not greater than where nitrogen and phosphoric acid alone were combined, showing that potash, whether used alone or with other materials, has not materially added to the production of peas.

The same fertilizers have not increased the yield of peas in the same proportion they did hay. Phosphoric acid was the most important constituent, whether used alone or in combinations; nitrogen with phosphoric acid was helpful; nitrogen alone, potash alone, and nitrogen and potash combined were used at a loss.

TABLE III—YIELDS OF PEA-VINE HAY OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Hay in Pounds per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Hay in Pounds per Acre.	Average Increase of Hay in Pounds per Acre Due to Fertilizer.	Value of Increase in Hay at $15.00 per Ton.	Cost of Fertilizer per Acre.	Value of Increase Over Cost of Fertilizer.
6	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12	4,200	3,600	1,968	1,040	.....	2,702	962	$ 7.21	$2.49	$ 4.72
7	11.5 pounds 13% blood=½N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	1.5	24	12	4,120	4,200	1,640	1,090	.....	2,762	1,022	7 66	2.14	5 52
8	Unfertilized=O=				2,720	2,400	1,120	720	.....	1,740	.....	.....	.....	.....
9	46 pounds 13% blood=2N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	6	24	12	4,000	4,280	2,160	1,470	.....	2,978	1,238	9 28	3.18	6 10
10	69 pounds 13% blood=3N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	9	24	12	4,400	4,800	2,180	1,400	.....	3,195	1,455	10.91	3.87	7.04

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12						2,200	.....	1,800	$13.50	$2.49	$ 11.01
9	11 5 pounds 13% blood=½N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	1 5	24	12						2,200	.....	1,800	13.50	2.14	11 36
10	46 pounds 13% blood=2N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	6	24	12						2,300	.....	1,900	14.25	3.18	11.07
11	Unfertilized=O=									400	.....	.....	.....	.....	.....
12	69 pounds 13% blood=3N= 171.1 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	9	24	12						2,200	.....	1,800	13.50	3.87	9.63

HAY.

These experiments were planned to determine the effect on the yield of hay of varying quantities of nitrogen, leaving the phosphoric acid and potash constant. On one plat the nitrogen was reduced by one-half, making the application 1½ pounds of nitrogen per acre, or practically one-half of 1 per cent in the fertilizer mixture. On two other plats it was increased by two and three times the normal quantity, or 6 and 9 pounds per acre respectively, representing 3 per cent of nitrogen in the fertilizer mixture in the highest application.

The results during the first four years on plats in Field C showed a profitable increase in the yields of hay from increased quantities of nitrogen, the average profit for the four years being $7.04 over the cost of the fertilizer application, or $2.84 more than an application of phosphoric acid alone gave, and $2.52 more than potash and phosphoric acid gave. For one year on the plats in Field A the results showed no increase in yields of hay from increased quantities of nitrogen. The most profitable yield on these plats was from the plat receiving one-half the normal quantity of nitrogen, and the yield on this plat was less profitable than that obtained from phosphoric acid alone. The yield on the plat (12) receiving the highest application of nitrogen was less profitable than that on the plats receiving phosphoric acid alone and phosphoric acid and potash, by $1.92 and $2.82 respectively. The losses on these plats were very close to the gains on the plats in Field C.

The four years' experiments, represented on these latter plats, taking the results as a whole, show some profit, as is shown in the yield of hay from the increased quantities of nitrogen, though it is small over the profits produced by phosphoric acid alone.

PEAS.

The yield of peas presented in Table IV are from the same plats as the hay results shown in Table III, the peas having been gathered on one-half the plats and the hay on the other half. The experiments were intended, as were those with hay, to show the effect of varying quantities of nitrogen on the yield of peas, the phosphoric acid and potash remaining constant. The results show that the most profitable yields on the plats in both fields were where one-half the quantity of nitrogen was applied, or about one-half of 1 per cent in the fertilizer mixture, and the profits on these plats were but slightly in excess of those where phosphoric acid alone and where phosphoric acid and potash were applied. The large application of nitrogen gave less profitable yields than phosphoric acid alone.

On the whole, the results are unfavorable to the application of nitrogen.

TABLE IV—YIELDS OF PEAS OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Peas in Bushels per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Peas in Bushels per Acre.	Average Increase in Bushels of Peas Due to Fertilizer.	Value of Increase in Peas at $1.00 per Bushel.	Cost of Fertilizer per Acre.	Value of Increase in Peas Over Cost of Fertilizer.
6	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	3	24	12	24.5	12.3	7.6	7.0	.....	13.4	3.1	$ 3.10	$2.49	$ .61
7	11.5 pounds 13% blood=½N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	1.5	24	12	22.2	15.5	9.3	7.7	.....	13.7	3.4	3.40	2.14	1.26
8	Unfertilized=O=				17.8	11.5	7.0	4.7	.....	10.3	.....	.....	.....	.....
9	46 pounds 13% blood=2N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	6	24	12	25.2	13.8	9.5	10.3	.....	14.7	4.4	4.40	3.18	1.22
10	69 pounds 13% blood=3N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	9	24	12	26.3	17.2	8.0	8.8	.....	15.1	4.8	4.48	3.87	.61

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	3	24	12	.....	.....	.....	.....	8.33	.....	6.60	$ 6.60	$2.49	$ 3.11
9	11.5 pounds 13% blood=½N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	1.5	24	12	.....	.....	.....	.....	9.50	.....	8.07	8.07	2.14	5.93
10	46 pounds 13% blood=2N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	6	24	12	.....	.....	.....	.....	9.17	.....	8.04	8.04	3.18	4.86
11	Unfertilized=O=				.....	.....	.....	.....	0.83	.....	.....	.....	.....	.....
12	69 pounds 13% blood=3N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	9	24	12	.....	.....	.....	.....	8.17	.....	7.34	7.34	3.87	3.47

TABLE V—YIELDS OF PEA-VINE HAY OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Hay in Pounds per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Hay in Pounds per Acre.	Average Increase of Hay in Pounds per Acre Due to Fertilizer.	Value of Increase in Hay at $15 00 per Ton.	Cost of Fertilizer per Acre.	Value of Increase Over Cost of Fertilizer.
6	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12	4,200	3,600	1,968	1,040	.....	2,702	962	$ 7.21	$2.49	$ 4.72
8	Unfertilized=O=				2,720	2,400	1,120	720	.....	1,740	.....	.....	.....	.....
14	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 30 pounds 20% manure salt=½K=	3	24	6	4,840	2,800	1,320	830	.....	2,448	708	5.31	2.19	3.12
15	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 120 pounds 20% manure salt=2K=	3	24	24	3,680	3,200	1,420	800	.....	2,275	535	4.01	3.09	.92
16	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 180 pounds 20% manure salt=3K=	3	24	36	4,000	3,400	1,680	860	.....	2,485	745	5.58	3.69	1.89

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12	.....	.....	.....	.....	2,200	.....	1,800	$13 50	$2.49	$ 11.01
16	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 30 pounds 20% manure salt=½K=	3	24	6	.....	.....	.....	.....	2,200	.....	1,600	12.00	2 19	9.81
17	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 120 pounds 20% manure salt=2K=	3	24	24	.....	.....	.....	.....	2,500	.....	1,900	14.25	3.09	11 16
18	Unfertilized=O=				.....	.....	.....	.....	600	.....	.....	.....	.....	.....
19	23 pounds 18% blood=N= 171.4 pounds 14% acid phosphate=P= 180 pounds 20% manure salt=3K=	3	24	36	.....	.....	.....	.....	1,900	.....	1,300	9.75	3.69	6.06

HAY.

The above experiments were planned to show the effect on the yield of hay of varying quantities of potash, the nitrogen and phosphoric acid remaining constant. On one plat one-half the normal quantity of potash was applied, or about 1½ per cent in the fertilizer mixture, while on two other plats two and three times the normal quantities were given, or 24 and 36 pounds per acre, the percentage of potash in the highest application being somewhat in excess of 9 per cent. While there are some variations in the yields, the results show decreased rather than increased yields from applications of potash, and on none of the plats in either of the fields were the profits from the applications of potash in any quantity as great as from phosphoric acid alone.

On the whole, these tests show that potash has decreased yields and profits.

PEAS.

The yields of peas presented in Table VI are from the same plats as the hay yields shown in Table V, one-half of each plat being used for obtaining the hay and pea yields respectively. In the four years' experiments on the plats in Field C the increase in the yields of peas was very small and not sufficient to overcome the cost of fertilizer, which was used, in three out of four cases, at a loss. In one year's experiments on the plats in Field A the fertilizer application produced decided increase in pea yields, but the profits in only two cases were greater than from phosphoric acid alone and in only one from phosphoric acid and potash, and the increases in these cases were not very large.

Taking them altogether, the results show that increases in quantities of potash have not profitably added to the yields of peas.

HAY.

The experiments, the results of which are presented in Tables VII and VIII, were planned to show the effect on the yield of hay and peas of varying quantities of phosphoric acid, the nitrogen and potash remaining constant. On one plat one-half the normal quantity of phosphoric acid was applied, or a quantity represented by approximately 86 pounds of 14 per cent acid phosphate, an equivalent to 4 per cent phosphoric acid in the fertilizer mixture. To two plats were applied two and three times the normal quantities of phosphoric acid represented by 342 and 514 pounds of 14 per cent acid phosphate respectively, or approximately 11 and 12 per cent phosphoric acid in the fertilizer applications. The results on the plats in both fields in all the years show with marked unanimity decided increases in the yields of hay for increased quantities of phosphoric acid.

TABLE VI—YIELDS OF PEAS OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Peas in Bushels per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Peas in Bushels per Acre.	Average Increase in Bushels of Peas Due to Fertilizer.	Value of Increase in Peas at $1.00 per Bushel.	Cost of Fertilizer per Acre.	Value of Increase in Peas Over Cost of Fertilizer.
6	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	3	24	12	24.50	12.30	7.60	7.00	.....	13.40	3.10	$ 3.10	$2 49	$ .61
8	Unfertilized=O=	.....	.....	.....	17.80	11.50	7.00	4.70	.....	10.30	.....	.....	.....	.....
14	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 30 pounds 20% manure salt=½K=	3	24	6	19.20	12.00	6.00	5.00	.....	10.60	.30	.30	2.19	*—1.89
15	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 120 pounds 20% manure salt=2K=	3	24	24	21.80	12.80	5.80	5.00	.....	11.40	1.10	1.10	3.09	*—1.99
16	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 180 pounds 20% manure salt=3K=	3	24	36	22.00	11.50	7.00	5.30	.....	10.50	.20	.20	3.69	*—3.49

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	3	24	12	.....	.....	.....	.....	8.33	.....	6.60	$ 6.60	$2 49	$ 4 11
16	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 30 pounds 20% manure salt=½K=	3	24	6	.....	.....	.....	.....	8.33	.....	5.00	5 00	2.19	2 81
17	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 120 pounds 20% manure salt=2K=	3	24	24	.....	.....	.....	.....	8.40	.....	5.07	5.07	3.09	1 98
18	Unfertilized=O=	.....	.....	.....	.....	.....	.....	.....	3.33	.....	.....	.....	.....	.....
19	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 180 pounds 20% manure salt=3K=	3	24	36	.....	.....	.....	.....	13.83	.....	10.50	10 50	3 69	6 81

*Loss.

TABLE VII—YIELDS OF PEA-VINE HAY OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Hay in Pounds per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Hay in Pounds per Acre.	Average Increase of Hay in Pounds per Acre Due to Fertilizer.	Value of Increase in Hay at $15 00 per Ton.	Cost of Fertilizer per Acre.	Value of Increase Over Cost of Fertilizer.
6	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12	4,200	3,600	1,968	1,040	.....	2,702	962	$ 7.21	$2.49	$ 4.72
8	Unfertilized=O=				2,720	2,400	1,120	720	.....	1,740	.....	.....	.....	.....
11	23 pounds 13% blood=N= 85.7 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	12	12	2,900	2,800	1,508	1,200	.....	2,107	367	2.75	1.89	.86
12	23 pounds 13% blood=N= 342.8 pounds 14% acid phosphate=2P= 60 pounds 20% manure salt=K=	3	48	12	4,500	4,400	2,140	1,140	.....	3,050	1,310	9.82	3.69	6.13
13	23 pounds 13% blood=N= 514.2 pounds 14% acid phosphate=3P= 60 pounds 20% manure salt=K=	3	72	12	4,600	4,600	2,200	920	.....	3,080	1,340	10.05	4.89	5.16

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12	.....	.....	.....	.....	2,200	.....	1,800	$13.50	$2.49	$ 11.01
11	Unfertilized=O=				.....	.....	.....	.....	400	.....	.....	.....	.....	.....
13	23 pounds 13% blood=N= 85.7 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	12	12	.....	.....	.....	.....	2,100	.....	1,700	12.75	1.89	10.86
14	23 pounds 13% blood=N= 342.8 pounds 14% acid phosphate=2P= 60 pounds 20% manure salt=K=	3	48	12	.....	.....	.....	.....	2,800	.....	2,400	18.00	3.69	14.31
15	23 pounds 13% blood=N= 514.2 pounds 14% acid phosphate=3P= 60 pounds 20% manure salt=K=	3	72	12	.....	.....	.....	.....	3,200	.....	2,800	21.00	4.89	16.11

The most profitable yields on the plats in Field C were from the plat receiving two quantities phosphoric acid or the equivalent of 342 pounds of acid phosphate per acre, while the most profitable return from the plats in Field A are from the one having three quantities of phosphoric acid or the equivalent of 514 pounds acid phosphate per acre, the profit in these cases being $6.13 and $16.11 per acre respectively.

The results, as a whole, show in the most striking way the need of this soil for phosphoric acid in the growth of pea-vine hay.

PEAS.

The pea yields in Table VIII are from the same plats as the hay yields presented in Table VII. The results point to the same conclusions as for hay, the most profitable results coming from two quantities of phosphoric acid on the plats in Field C and three quantities from the plats in Field A.

HAY.

The tests, the results of which are presented in Table IX, were made to see what effect lime alone and lime in combination with the three fertilizer constituents—nitrogen, phosphoric acid, and potash—in normal quantities would have on the yield of hay. The lime was applied every fourth year at the rate of 500 pounds rock or 1,000 pounds slaked lime per acre.

Lime alone, L (Plats 7^2 and 14). On the plat in Field C lime alone gave a profitable yield of pea-vine hay in the four years' test, the average increase being worth $2.70 per acre. On the plat in Field A in one year's test there was no increase in yield over the unfertilized plat, and the lime was therefore used at a loss.

Lime with Complete Fertilizer, N P K L (Plats 9^2 and 15). Where lime was used in combination with the three fertilizer constituents there was a slight increase over what the complete fertilizer alone gave, but not sufficient to make the profit any greater than was obtained from the three fertilizer constituents by themselves.

Taken as a whole, lime was of doubtful value in increasing the yield of pea-vine hay.

PEAS.

The pea yields presented in Table X were obtained from the same plats as the hay yields recorded in Table IX preceding. The experiments were planned to test the effect of lime alone and lime with complete fertilizer on peas, as stated for hay above. On one series of the plats lime alone gave a small profit, while on the other series there was just about a corresponding loss. On the plats in one field there was an increased yield and profit from the use of lime in connection with a complete fertilizer, while on the plats in the other field the profits were practically the same where lime was used and where it was not.

TABLE VIII—YIELDS OF PEAS OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Peas in Bushels per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Peas in Bushels per Acre.	Average Increase in Bushels of Peas Due to Fertilizer.	Value of Increase in Peas at $1.00 per Bushel.	Cost of Fertilizer per Acre.	Value of Increase in Peas Over Cost of Fertilizer.
6	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12	24.50	12.30	7.60	7.00	.....	13.40	3.10	$ 3.10	$2.49	$ .61
8	Unfertilized=O=				17.80	11.50	7.00	4.70	.....	10.30	.....	.....	.....	.....
11	23 pounds 13% blood=N= 85.7 pounds 14% acid phosphate=½P= 60 pounds 20% manure salt=K=	3	12	12	15.20	13.80	6.50	5.30	.....	10.20	—.10	—.10	1.89	*—1.79
12	23 pounds 13% blood=N= 342.8 pounds 14% acid phosphate=2P= 60 pounds 20% manure salt=K=	3	48	12	29.70	13.50	12.70	7.30	.....	15.80	5.50	5.50	3.69	1.81
13	23 pounds 13% blood=N= 514.2 pounds 14% acid phosphate=3P= 60 pounds 20% manure salt=K=	3	72	12	25.30	15.70	12.70	5.70	.....	14.90	4.60	4.60	4.89	*—.39

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= 171.4 pounds 14% acid phosphate=P= 60 pounds 20% manure salt=K=	3	24	12					8.33		6.60	$ 6.60	$2.49	$ 4.11
11	Unfertilized=O=								.83		.....	.....	.....	.....
13	23 pounds 13% blood=N= 85.7 pounds 14% acid phosphate=½P= 60 pounds 20% manure salt=K=	3	12	12					6.33		5.50	5.50	1.89	3.61
14	23 pounds 13% blood=N= 342.8 pounds 14% acid phosphate=2P= 60 pounds 20% manure salt=K=	3	48	12					7.50		6.67	6.67	3.69	2.98
15	23 pounds 13% blood=N= 514.2 pounds 14% acid phosphate=3P= 60 pounds 20% manure salt=K=	3	72	12					14.00		13.17	13.17	4.89	8.28

*Loss.

TABLE IX—YIELDS OF PEA-VINE HAY OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Hay in Pounds per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Hay in Pounds per Acre.	Average Increase of Hay in Pounds per Acre Due to Fertilizer.	Value of Increase in Hay at $15.00 per Ton.	Cost of Fertilizer per Acre.	Value of Increase Over Cost of Fertilizer.
7[2]	500 pounds unslaked lime every fourth year=L=				4,320	2,400	1,880	700		2,325	445	$ 3.33	$ 63	$ 2 70
8[1]	Unfertilized=O=				2,720	2,400	1,120	720		1,740				
6[1]	23 pounds 13% blood=N=	3			4,200	3,600	1,968	1,040		2,702	962	7 21	2.49	4 72
	171.4 pounds 14% acid phosphate=P=		24											
	60 pounds 20% manure salt=K=			12										
9[2]	23 pounds 13% blood=N=	3			4,840	3,600	2,500	740		2,920	1,040	7.80	3.12	4.68
	171.4 pounds 14% acid phosphate=P=		24											
	60 pounds 20% manure salt=K=			12										
8[2]	500 pounds unslaked lime every fourth year=L=				3,600	2,200	1,120	600		1,880				
	Unfertilized=O=													
10[2]	171.4 pounds 14% acid phosphate=P=		24		3,720	3,400	1,280	940		2,335	455	3.41	2 40	1.01
	120 pounds 20% manure salt=2K=			24										
11[2]	171.4 pounds 14% acid phosphate=P=		24		4,200	3,200	1,380	900		2,420	540	4 05	3.00	1 05
	180 pounds 20% manure salt=3K=			36										
12[2]	171.4 pounds 14% acid phosphate=P=		24		4,320	4,200	1,400	960		2,720	840	6 30	1.80	4.50
	60 pounds 20% manure salt=K=			12										
13[2]	342.8 pounds 14% acid phosphate=2P=		48		4,720	4,000	1,600	980		2,825	945	7.08	3.00	4.08
	60 pounds 20% manure salt=K=			12										

RESULTS IN 1908 ON FIELD A.

11	Unfertilized=O=								400			$	$	$
14	500 pounds unslaked lime every fourth year=L=								400				.63	*—.63
8	23 pounds 13% blood=N=	3							2,200		1,800	13.50	2.49	11 01
	171.4 pounds 14% acid phosphate=P=		24											
	60 pounds 20% manure salt=K=			12										
15	23 pounds 13% blood=N=	3							2,200		1,900	14.25	3 12	11.13
	171.4 pounds 14% acid phosphate=P=		24											
	60 pounds 20% manure salt=K=			12										
18	500 pounds unslaked lime every fourth year=L=								300					
	Unfertilized=O=													

*Loss.

TABLE X—YIELDS OF PEAS OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Peas in Bushels per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Peas in Bushels per Acre.	Average Increase in Bushels of Peas Due to Fertilizer.	Value of Increase in Peas at $1 00 per Bushel.	Cost of Fertilizer per Acre.	Value of Increase in Peas Over Cost of Fertilizer.
7[2]	500 pounds unslaked lime every fourth year—L—				18.20	11.50	10.70	4.10		11.10	1 50	$ 1 50	$ 63	$ 87
8[1]	Unfertilized—O—				17.80	11.50	7 00	4 70		10.30				
6[1]	23 pounds 13% blood—N—	3												
	171.4 pounds 14% acid phosphate—P—		24		24.50	12 30	7 60	7.00		13 40	3 10	3 10	2 49	61
	60 pounds 20% manure salt—K—			12										
9[2]	23 pounds 13% blood—N—	3												
	171.4 pounds 14% acid phosphate—P—		24		24 00	15.70	15 00	5 80		15 10	5 50	5.50	3 12	2 38
	60 pounds 20% manure salt—K—			12										
	500 pounds unslaked lime every fourth year—L—													
8[2]	Unfertilized—O—				16 30	10 20	8 00	4 00		9 60				
10[2]	171.4 pounds 14% acid phosphate—P—		24		20 80	12 80	6.70	3 80		11.00	1.40	1 40	2 40	*—1.00
	120 pounds 20% manure salt—2K—			24										
11[2]	171 4 pounds 14% acid phosphate—P—		24		23.80	12 30	8 00	3.30		11.60	2.00	2.00	3 00	*—1.00
	180 pounds 20% manure salt—3K—			36										
12[2]	171.4 pounds 15% acid phosphate—P—		24		24.50	11.80	8 00	4 10		12.10	2.50	2.50	1 89	61
	60 pounds 20% manure salt—K—			12										
13[2]	342.8 pounds 14% acid phosphate—2P—		48		24.80	13 50	9 00	2 80		12 50	2 90	2 90	3 00	* 10
	60 pounds 20% manure salt—K—			12										

RESULTS IN 1908 ON FIELD A.

11	Unfertilized—O—								.83			$	$	$
14	500 pounds unslaked lime every fourth year—L—								1.17		33	33	63	Loss.
8	23 pounds 13% blood—N—	3												
	171.4 pounds 14% acid phosphate—P—		24						8 33		6 83	6 83	2 49	3 34
	60 pounds 20% manure salt—K—			12										
15	23 pounds 13% blood—N—	3												
	171.4 pounds 14% acid phosphate—P—		24						8 17		6 67	6 67	3.42	3.55
	60 pounds 20% manure salt—K—			12										
18	500 pounds unslaked lime every fourth year—L—													
	Unfertilized—O—								1.50					

*Loss.

TABLE XI—YIELDS OF PEA-VINE HAY OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Hay in Pounds per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Hay in Pounds per Acre.	Average Increase of Hay in Pounds per Acre Due to Fertilizer.	Value of Increase in Hay at $15 00 per Ton.	Cost of Fertilizer per Acre.	Value of Increase Over Cost of Fertilizer.
6	23 pounds 13% blood = N 171.4 pounds 14% acid phosphate = P 60 pounds 20% manure salt = K	3	24	12	4,200	3,600	1,968			3,256	1,176	$ 8 82	$2 49	$ 6 33
1	11.5 pounds 13% blood = ½N 85.7 pounds 14% acid phosphate = ½P 30 pounds 20% manure salt = ½K	1.5	12	6	3,220	2,800	1,000			2,340	33	.24	1 24	*—1 00
2	34.5 pounds 13% blood = 1½N 257.1 pounds 14% acid phosphate = 1½P 90 pounds 20% manure salt = 1½K	4.5	36	18	3,880	3,800	2,040			3,240	933	7.00	3.73	3.27
3	46 pounds 13% blood = 2N 342.8 pounds 14% acid phosphate = 2P 120 pounds 20% manure salt = 2K	6	48	24	4,800	4,000	2,360			3,720	1,413	10.60	4.98	5.62
8	Unfertilized = O				3,600	2,200	1,120			2,307				
8†	Unfertilized = O				2,720	2,400	1,120			2,080				

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood = N 171.4 pounds 14% acid phosphate = P 60 pounds 20% manure salt = K	3	24	12					2,200	1,800	$13 50	$2.49	$ 11 01
11†	Unfertilized = O								400				
18	Unfertilized = O								600				
20	11.5 pounds 13% blood = ½N 85.7 pounds 14% acid phosphate = ½P 30 pounds 20% manure salt = ½K	1.5	12	6					2,200	1,600	12 00	1.24	10 76
1	34.5 pounds 13% blood = 1½N 257.1 pounds 14% acid phosphate = 1½P 90 pounds 20% manure salt = 1½K	4.5	36	18					2,200	1,800	13 50	3 73	9 77
2	46 pounds 13% blood = 2N 342.8 pounds 14% acid phosphate = 2P 120 pounds 20% manure salt = 2K	6	48	24					2,900	2,500	18 00	4 98	13 02
3	69 pounds 13% blood = 3N 514.2 pounds 14% acid phosphate = 3P 180 pounds 20% manure salt = 3K	9	72	36					2,800	2,400	18 75	7.47	11 28
4†	Unfertilized = O								400				

*Loss.

†Checks for plats 5, 6, 7, 8, 9 and 10 have been obtained from the yields of plats 4 and 11. In making these calculations, it has been assumed that there was a uniform decrease in the natural fertility from plat 4 to plat 11 as represented by the yields of peas on these two plats, and a corrected check figured for each of the six treated plats. In the case of hay, this method of calculating check plats gives the same result as when the plats 4 and 11 are used directly as checks, since the yield of hay was the same on these two plats.

TABLE XII—YIELDS OF PEAS OBTAINED IN FERTILIZER EXPERIMENTS IN FIELD C.

No. of Plat.	Fertilizer Applied per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Peas in Bushels per Acre. 1904.	1905.	1906.	1907.	1908.	Average Yield of Peas in Bushels per Acre.	Average Increase in Bushels of Peas Due to Fertilizer.	Value of Increase in Peas at $1.00 per Bushel.	Cost of Fertilizer per Acre.	Value of Increase in Peas Over Cost of Fertilizer.
6[1]	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	3	24	12	24.50	12 30	7.60	.....	.....	14.80	2.70	$ 2.70	$2.49	$ .21
1	11.5 pounds 13% blood=½N= / 85.7 pounds 14% acid phosphate=½P= / 30 pounds 20% manure salt=½K=	1.5	12	6	21.50	12.80	6.30	.....	.....	13.50	2.00	2.00	1.24	.76
2	34.5 pounds 13% blood=1½N= / 257.1 pounds 14% acid phosphate=1½P= / 90 pounds 20% manure salt=1½K=	4.5	36	18	23.30	18.70	8.50	.....	.....	16.80	5.30	5 30	3.73	1.57
3	46 pounds 13% blood=2N= / 342.8 pounds 14% acid phosphate=2P= / 120 pounds 20% manure salt=2K=	6	48	24	24.70	20.20	11.20	.....	.....	18.70	7.20	7.20	4.98	2 22
8	Unfertilized=O=	.....	.....	.....	16.30	10.20	8.00	.....	.....	11.50	.....	.....	.....	.....
8[1]	Unfertilized=O=	.....	.....	.....	17.80	11.50	7.00	.....	.....	12.1	.....	.....	.....	.....

RESULTS IN 1908 ON FIELD A.

8	23 pounds 13% blood=N= / 171.4 pounds 14% acid phosphate=P= / 60 pounds 20% manure salt=K=	3	24	12	.....	.....	.....	.....	8.33	.....	6.60	$ 6.60	$2.49	$ 4.11
18	Unfertilized=O=	.....	.....	.....	.....	.....	.....	.....	3.33	.....	.....	.....	.....	.....
20	11.5 pounds 13% blood=½N= / 85.7 pounds 14% acid phosphate=½P= / 30 pounds 20% manure salt=½K=	1.5	12	6	.....	.....	.....	.....	4.90	.....	1.57	1.57	1.24	.33
1	34.5 pounds 13% blood=1½N= / 257.1 pounds 14% acid phosphate=1½P= / 90 pounds 20% manure salt=1½K=	4.5	36	18	.....	.....	.....	.....	8.83	.....	8.00	8.00	3.73	4.27
2	46 pounds 13% blood=2N= / 342.8 pounds 14% acid phosphate=2P= / 120 pounds 20% manure salt=2K=	6	48	24	.....	.....	.....	.....	10.67	.....	9.84	9.84	4.98	4.86
3	69 pounds 13% blood=3N= / 514.2 pounds 14% acid phosphate=3P= / 180 pounds 20% manure salt=3K=	9	72	36	.....	.....	.....	.....	10.83	.....	10.00	10.00	7.47	2.53
4	Unfertilized=O=	.....	.....	.....	.....	.....	.....	.....	.83	.....	.....	.....	.....	.....

The experiments represented by plats 10^2, 11^2, 12^2, 13^2 in Field C were intended to show the effect of increasing the potash and phosphoric acid respectively when only these two constituents were used. The results show no increase of profit from increasing the amount of potash and none from increasing the phosphoric acid when potash alone was present over what the normal amount of phosphoric acid and potash (P K) gave.

HAY.

Experiments in Table XI were planned to show effect of increasing and decreasing the normal (N P K equals 300 pounds of a fertilizer mixture containing 8 per cent phosphoric acid, 4 per cent of potash, and 1 per cent nitrogen) fertilizer application on the yields of hay and peas. The applications were at the rate of 150 pounds per acre, ½ (N P K); 300 pounds per acre, N P K; 450 pounds per acre, 1½ (N P K); 600 pounds per acre, 2 (N P K); and 900 pounds per acre, 3 (N P K). The results show an increased yield of hay for the increased applications on the plats in Field A, the greatest average profit coming from the application of 300 pounds of fertilizer per acre; while on plats in Field C 600 pounds per acre gave the most profitable yields, though these applications did not give as large and profitable yields as smaller quantities of fertilizers containing larger amounts of phosphoric acid, as shown in Table VII.

The pea yields presented in the Table XII are from the same plats as the hay yields in Table XI, and show the effect of varying amounts of the normal fertilizer application. The most profitable yields were obtained on both fields from the plats receiving 600 pounds of the normal fertilizer application.

GENERAL SUMMARY OF RESULTS OF FERTILIZER TESTS.

1. The same fertilizers did not increase the yield of peas in the same proportions they did hay. The profits were therefore not as great from fertilizing peas for pea yields as for hay. It is to be remembered, however, that where there was an increased yield and profit from the use of fertilizers, that the peas only were removed and the increased yield of hay was left on the land to increase its fertility. Taking these two factors into consideration—the yield of peas and improvement of soil from the extra growth of vines and stubble left on the land—the increase in yield and profits were the same.

2. For the production of hay, nitrogen alone, potash alone, and nitrogen and potash combined, produced small increase in the yields of hay over the plats receiving no fertilizer. For the production of peas these two constituents used alone and in combination with each other were at a loss.

On the whole, it may be therefore said that nitrogen alone and potash alone and nitrogen and potash combined with each other have little or no value in the growth of peas on this land.

3. For the production of hay, phosphoric acid alone produced decidedly increased yields at good profits. Nitrogen combined with phosphoric acid did not increase the yields over phosphoric acid alone. Potash added to phosphoric acid gave small increases over phosphoric acid alone, while nitrogen and potash combined with phosphoric acid gave increases over phosphoric acid alone, but without profit. For the production of peas, phosphoric acid alone produced increased yields; nitrogen combined with phosphoric acid added slightly to the increase of phosphoric acid alone, as did potash also. Potash and nitrogen combined with phosphoric acid did not produce larger yields than nitrogen and phosphoric acid alone, showing that potash had but little effect in increasing the yield of peas.

The experiments show that phosphoric acid is the most important constituent for use on this soil in increasing the yield and adding to the profit in growing cowpeas.

4. The amount of nitrogen in the normal fertilizer (300 pounds per acre) used in the pea experiments was 1 per cent. Varying this amount from one-half ($\frac{1}{2}$) per cent to 3 per cent did not, on the whole, taking the yield of peas and hay together, show any decided advantage for large amounts of nitrogen.

5. The amount of potash in the normal fertilizer (300 pounds per acre) application was 4 per cent. Increasing the amount of potash up to 9 per cent in the mixture gave, as a whole, a decrease in yields and profits. This further emphasizes the fact that this soil not only does not need potash in the growth of peas, but if added in large quantities it will be at a loss.

6. The amount of phosphoric acid in the normal fertilizer (300 pounds per acre) application was 8 per cent. Reducing this quantity by one-half and increasing it by two and three times the normal quantity showed decided increases in the yields of both peas and hay for the larger quantities, emphasizing, in the most emphatic way the need of this soil of phosphoric acid for the production of cowpeas. The most profitable yields on any of the plats were obtained from those receiving large amounts of phosphoric acid. The amounts of phosphoric acid in the mixtures which gave the largest profits varied between 342 and 514 pounds of 14 per cent acid phosphate.

7. Taken as a whole, the tests with lime did not show that this soil needs this constituent especially in the growth of peas.

8. Increasing the amount of the normal fertilizer application increased the yields and the profits, the best yields, on the whole, coming from the applications of 300 to 600 pounds.

9. Increasing the amount of the normal fertilizer application increased the yields and the profits, the best yields, on the whole, coming from the applications of 300 to 600 pounds.

10. Taking all the experiments into consideration, they show that this soil does not need potash for the most profitable production of peas, and that large amounts decrease the yields.

11. Phosphoric acid is the most needed constituent on this soil. The analysis of the soil shows that it is very low in phosphoric acid. Field tests and chemical analysis of the soil are therefore in entire harmony in showing the need of this soil for growing peas.

12. The most profitable yields have been obtained from the use of 300 to 500 pounds of 14 per cent acid phosphate per acre, or 42 pounds to 70 pounds phosphoric acid.

13. In growing peas on the above land we advise the use of phosphoric acid alone as stated above, 300 pounds acid phosphate being a good application and 500 pounds not too much. No potash-supplying material should be employed. In case the land is very poor, so that the peas do not start well at first, an amount of cotton-seed meal, dried blood, or some other material may be added which will supply sufficient nitrogen to make 1 per cent nitrogen in the fertilizer mixture. Where 300 pounds and 500 pounds of 14 per cent acid phosphate respectively are used 25 pounds and 42 pounds of blood will supply the necessary nitrogen.

14. Our soil analyses of the various type soils of the State and experiments on the Buncombe Test Farm indicate that these results will apply to the red (cecil) clay loams, red (cecil) clays and valley soils of the piedmont and valley and main upland soils of the mountain sections of the State.

II. VARIETY TESTS OF COWPEAS.

The variety tests of cowpeas were begun on the Iredell Farm in 1903. The results of six years' work are presented in this report. The tests have included 31 varieties, embracing the main ones grown in this and adjoining States, as well as many of the less important ones. The results are valuable as showing the varieties which are best suited to the State, and especially to the section where the experiments were carried on, for pea and hay production, and for grazing and soil improvement. The results are presented first in tables giving the data for each year separately, and afterwards in a table where all of the data for the several years are brought together. In the yearly tables will be found the varieties tested, the yield of peas in bushels, of hay in pounds per acre, date of planting, the number of days to mature hay and peas, and the ranking according to productiveness for both peas and hay. These cover the main facts necessary in judging of the value of varieties and their adaptability to different conditions and for different purposes. The yearly tables follow:

TABLE XIII—RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1903.

Rank as to Productivity.		Variety.	Yield of Peas in Bushels of 60 Pounds per Acre.	Yield of Hay in Pounds per Acre.	Date of Planting.	Number of Days to Maturity of Peas.	Number of Days to Maturity of Hay.
Peas.	Hay.						
1	8	Whittle	13.0	2,517	6-19	110	90
2	2	Southdown	12.9	3,388	6-19	110	90
3	11	New Era	11.9	1,561	6-19	110	78
4	3	Red Crowder	11.3	3,315	6-19	110	90
5	6	Small Black	11.0	2,650	6-19	110	90
6	1	Iron	10.9	3,775	6-19	110	90
7	5	Small Black Eye	8.7	2,856	6-19	110	90
8	4	Large Black Eye	7.9	2,880	6-19	110	90
9	12	Red Ripper	7.8	1,234	6-19	110	82
10	13	Sixty-day	7.7	1,222	6-19	110	78
11	7	Brown-Eye Crowder	7.4	2,541	6-19	110	90
12	10	Clay	7.3	2,130	6-19	110	82
12	14	Yellow Sugar Crowder	7.3	1,113	6-19	110	82
13	9	Small Lady	6.4	2,335	6-19	110	90

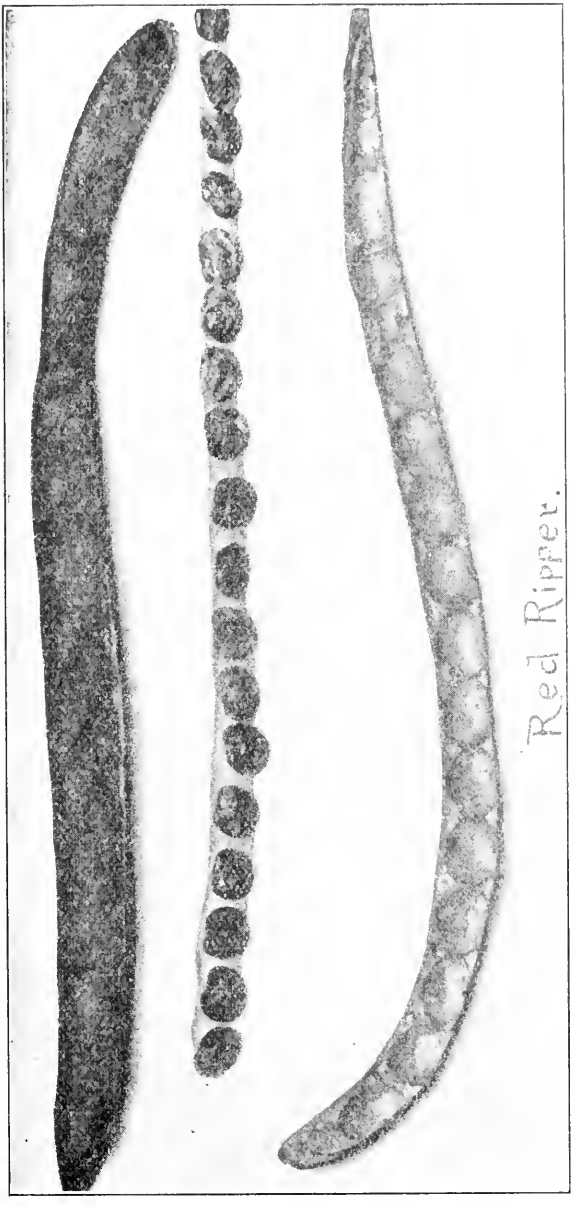

Red Ripper.

TABLE XIV—RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1904.

Rank as to Productivity.		Variety.	Yield of Peas in Bushels of 60 Pounds per Acre.	Yield of Hay in Pounds per Acre.	Date of Planting.	Number of Days to Maturity of Peas.	Number of Days to Maturity of Hay.
Peas.	Hay.						
1	2	Yellow Sugar Crowder	15 0	6,600	6-2	117	105
2	12	Southdown	14 5	4,200	6-2	118	96
2	7	Red Crowder	14 5	5,240	6-2	117	98
3	11	Whittle	14.3	4,400	6-2	99	88
4	10	Small Black	14 0	4,800	6-2	112	90
5	5	Sixty-day	13 8	5,600	6-2	117	92
5	1	Powell's Early Prolific	13 8	7,200	6-2	99	95
6	13	Brown-Eye Crowder	12 7	4,000	6-2	117	96
7	4	Unknown	12 3	6,200	6-2	117	105
8	13	Small Black Eye	12 0	4,000	6-2	112	95
8	3	Iron	12 0	6,400	6-2	99	87
9	9	Small Lady	11 3	4,800	6-2	99	95
10	8	Whippoorwill	11 2	4,920	6-2	99	72
11	3	Clay	10 5	6,400	6-2	117	105
11	6	Red Ripper	10 5	5,480	6-2	117	98
11	13	New Era	10 5	4,000	6-2	99	72
12	14	Large Black Eye	10 0	2,600	6-2	117	98

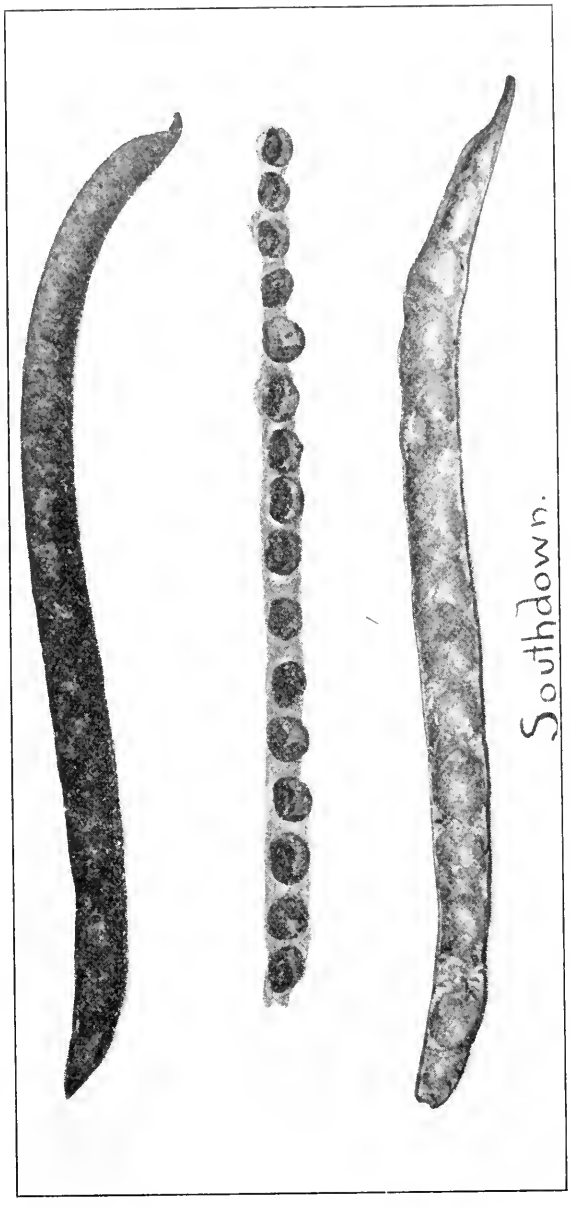

Southdown.

TABLE XV—RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1905.

Rank as to Productivity. Peas.	Rank as to Productivity. Hay.	Variety.	Yield of Peas in Bushels of 60 Pounds per Acre.	Yield of Hay in Pounds per Acre.	Date of Planting.	Number of Days to Maturity of Peas.	Number of Days to Maturity of Hay.
1	3	New Era	16.7	2,800	6-12	112	75
2	5	Sixty-day	15.8	2,500	6-12	87	71
3	7	Whittle	14.7	2,000	6-12	110	86
4	7	Chinese Brown Eye	14.3	2,000	6-12	112	78
5	6	Warren's New Hybrid	13.3	2,200	6-12	92	73
5	8	Small Black	13.3	1,800	6-12	110	87
6	2	Clay	13.2	3,200	6-12	110	92
7	3	Whippoorwill	12.3	2,800	6-12	112	84
7	7	Iron	12.3	2,000	6-12	112	73
8	1	Unknown	12.2	4,200	6-12	118	85
9	9	Chinese Whippoorwill	11.7	1,600	6-12	112	74
10	9	Southdown	11.5	1,600	6-12	110	92
11	9	Powell's Early Prolific	11.2	1,600	6-12	112	90
12	2	Mealer's Clay	10.3	3,200	6-12	112	89
13	7	Black Crowder	10.0	2,000	6-12	112	75
14	4	Brown Coffee	9.8	2,600	6-12	118	92
14	6	Large Black Eye	9.8	2,200	6-12	110	86
15	7	Red Crowder	8.8	2,000	6-12	110	92
15	7	Small Lady	8.8	2,000	6-12	110	82
15	11	Small Black Eye	8.8	1,400	6-12	110	84
16	9	Michigan Favorite	8.7	1,600	6-12	112	72
17	8	Red Ripper	8.0	1,800	6-12	110	101
18	11	Brown-Eye Crowder	7.7	1,400	6-12	110	82
19	7	Yellow Sugar Crowder	7.0	2,000	6-12	119	92
20	6	Delicious	6.8	2,200	6-12	112	79
21	7	Chinese Red	6.7	2,200	6-12	112	77
21	8	Warren's Extra Early	6.7	1,800	6-12	87	73
22	10	Old Man	4.7	1,480	6-12	92	70
------	7	Small White India	--------	2,000	6-12	112	76
------	9	Soja Beans	--------	1,600	6-12	--------	74

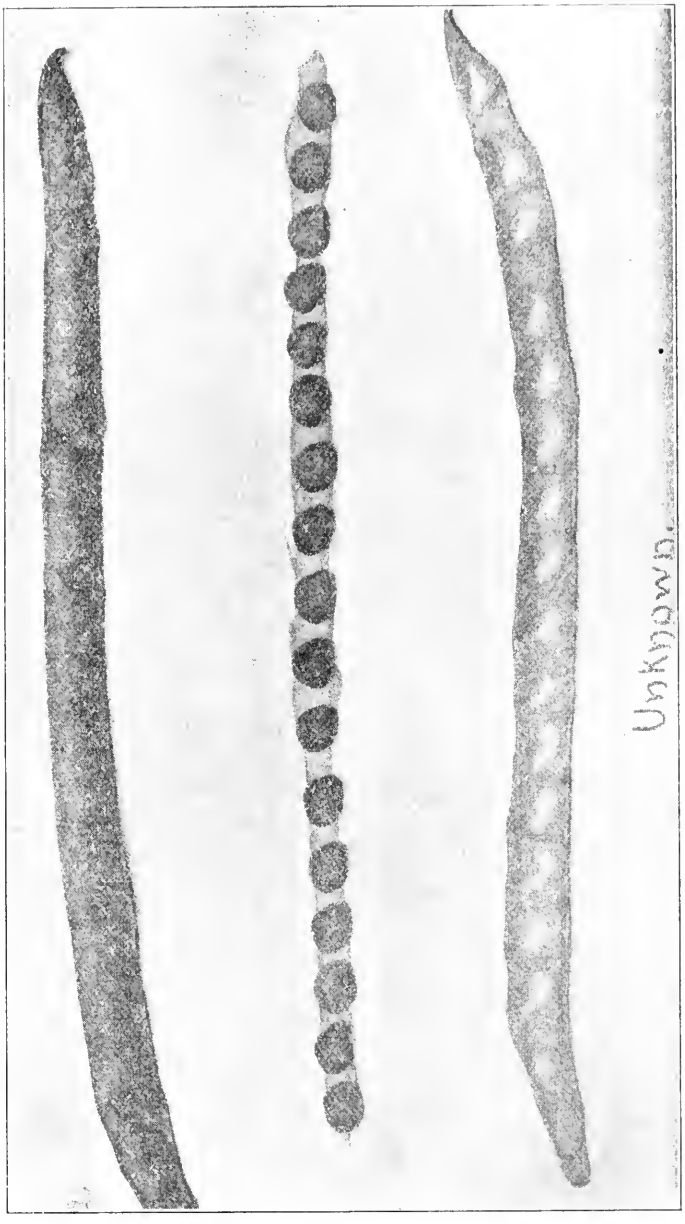

Unknown.

TABLE XVI—RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1906.

Rank as to Productivity.		Variety.	Yield of Peas in Bushels of 60 Pounds per Acre.	Yield of Hay in Pounds per Acre.	Date of Planting.	Number of Days to Maturity of Peas.	Number of Days to Maturity of Hay.
Peas.	Hay.						
1	9	Whippoorwill	16.8	3,080	6-2	107	95
2	7	Small Black	14.7	3,400	6-2	107	72
3	13	Whittle	13.3	2,400	6-2	107	102
4	5	Iron	11.8	3,780	6-2	107	95
5	16	Large Black Eye	11.7	1,960	6-2	107	90
6	12	Chinese Brown Eye	11.1	2,480	6-2	128	72
6	17	New Era	11.1	1,800	6-2	107	72
7	19	Michigan Favorite	9.7	1,409	6-2	128	95
8	15	Small Black Eye	8 0	2,240	6-2	107	90
8	18	Sixty-day	8 0	1,600	6-2	107	102
9	14	Small Lady	7.8	2,300	6-2	107	95
10	10	Mealer's Clay	7.3	3,000	6-2	128	72
11	13	Powell's Early Prolific	7.0	2,400	6-2	107	72
12	11	Southdown	6 2	2,800	6-2	128	95
13	6	Red Crowder	4.6	3,480	6-2	128	102
13	8	Yellow Sugar Crowder	4 6	3,160	6-2	128	102
14	13	Black Crowder	2.7	2,400	6-2	128	95
15	3	Red Ripper	2 2	4,120	6-2	128	102
15	4	Clay	2 2	4,000	6 2	128	102
16	19	Warren's New Hybrid	2 2	1,400	6-2	128	95
17	1	Unknown	1.8	5,200	6-2	128	72
18	2	Brown Coffee	1.7	4,200	6-2	128	95
19	....	Delicious	*	.....	6-2	*	.....
19	.....	Chinese Red	*	.....	6-2	*	.....

*Peas all rotted in field.

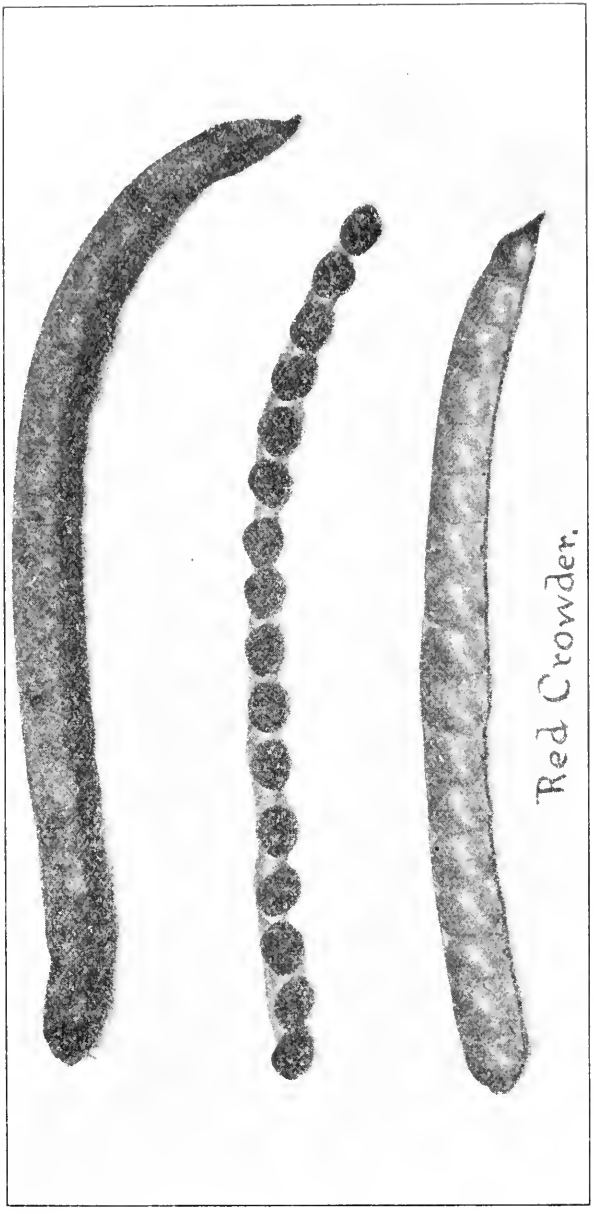

Red Crowder.

TABLE XVII—RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1907.

Rank as to Productivity.		Variety.	Yield of Peas in Bushels of 60 Pounds per Acre.	Yield of Hay in Pounds per Acre.	Date of Planting.	Number of Days to Maturity of Peas.	Number of Days to Maturity of Hay.
Peas.	Hay.						
1	8	Red Ripper	18.0	2,600	7-6	94	88
2	6	Red Crowder	16.2	2,840	7-6	94	88
3	9	Whittle	15.7	2,400	7-6	91	75
4	3	Clay Crowder	14.0	3,120	7-6	94	88
4	7	Yellow Sugar Crowder	14.0	2,800	7-6	94	88
5	16	Sixty-day	13.7	1,800	7-6	91	75
6	4	Small Black	13.3	3,000	7-6	94	88
7	12	Small Lady	12.3	2,060	7-6	91	75
8	3	Whippoorwill	10.6	3,120	7-6	94	88
8	13	New Era	10.6	2,000	7-6	91	75
9	15	Southdown	10.3	1,940	7-6	101	75
10	5	Brown Coffee	9.7	2,920	7-6	94	88
11	1	Unknown Black	9.3	3,600	7-6	94	88
11	16	Mealer's Clay	9.3	1,800	7-6	94	75
12	14	Small Black Eye	9.0	1,960	7-6	91	81
13	7	Michigan Favorite	8.7	2,800	7-6	94	88
13	10	Powell's Early Prolific	8.7	2,180	7-6	91	81
13	11	Large Black Eye	8.7	2,120	7-6	101	75
14	13	Clay	5.8	2,000	7-6	94	88
15	2	Iron	5.3	3,280	7-6	94	88

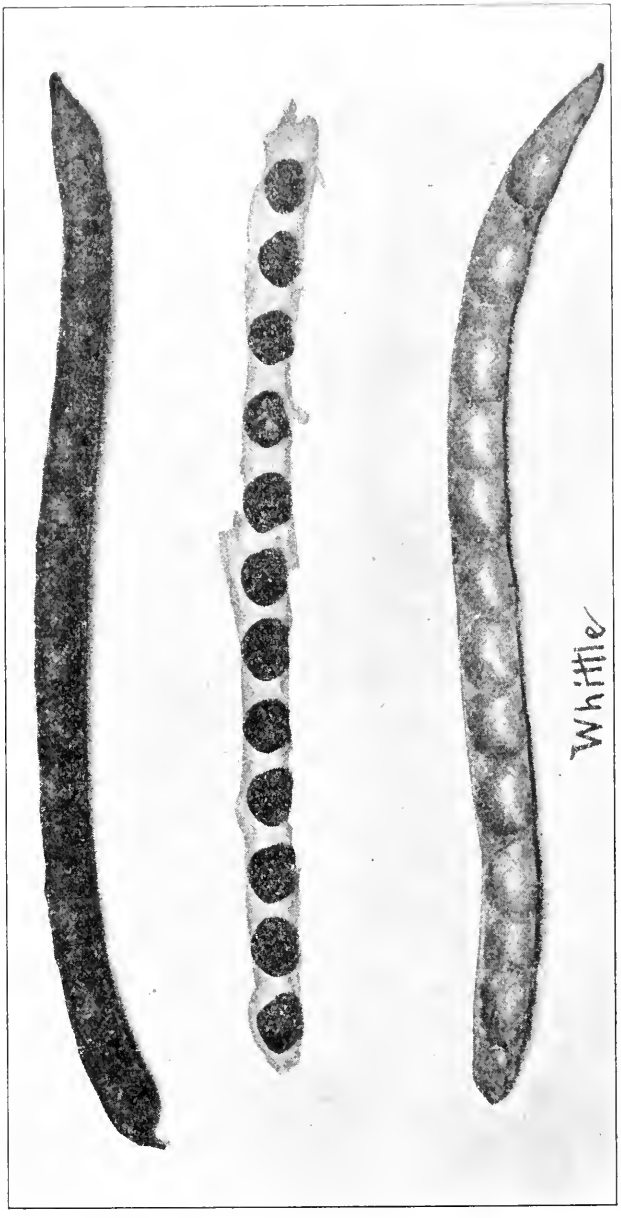
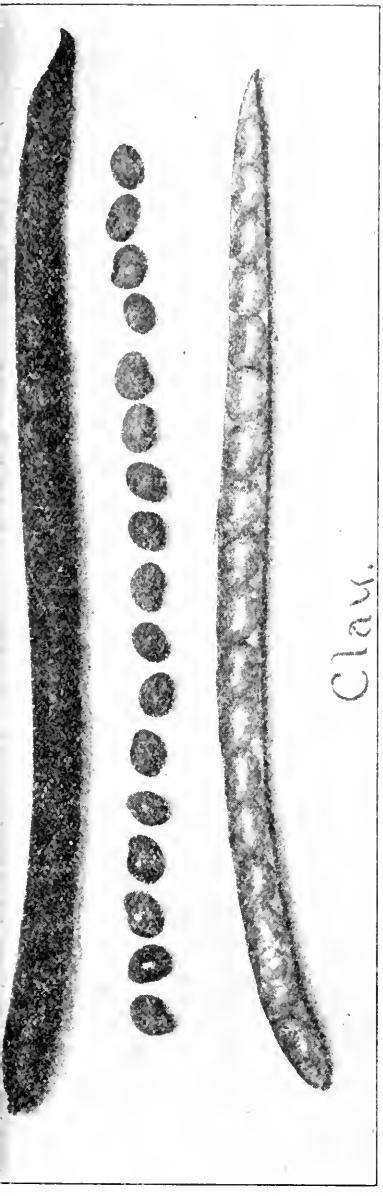
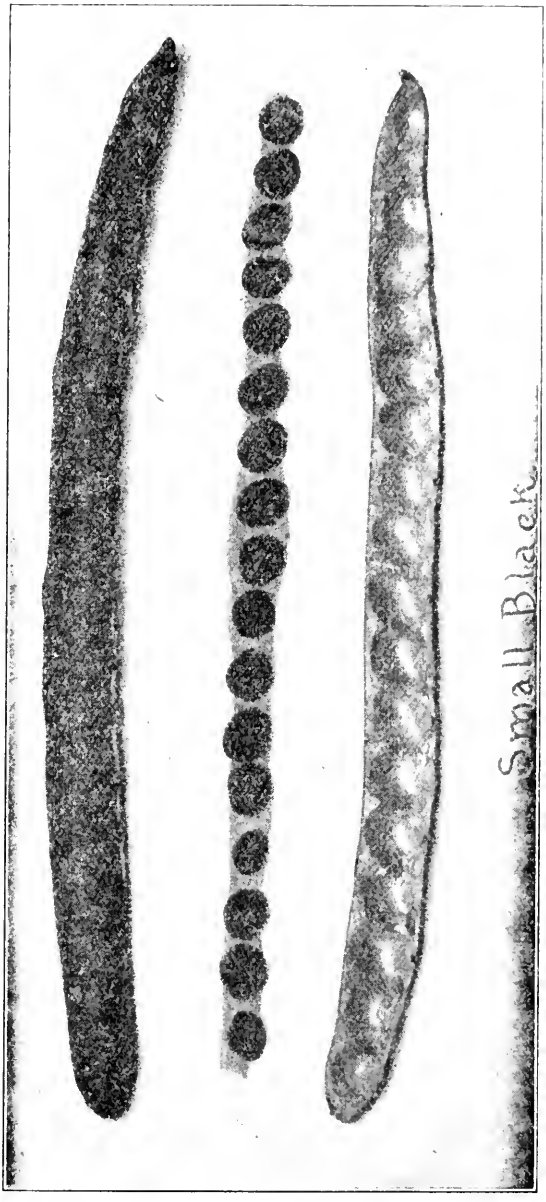

Whittier

TABLE XVIII—RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1908.

Rank as to Productivity.		Variety.	Yield of Peas in Bushels of 60 Pounds per Acre.	Yield of Hay in Pounds per Acre.	Date of Planting.	Number of Days to Maturity of Peas.	Number of Days to Maturity of Hay.
Peas.	Hay.						
1	3	New Era	10.7	4,200	6-27	84	75
1	5	Large Black Eye	10.7	3,600	6-27	90	87
2	12	Sixty-day	10 5	2,200	6-27	84	75
3	4	Whittle	10.0	4,000	6-27	90	75
4	5	Unknown Black	9.2	3,800	6-27	90	87
5	7	Small Black Eye	8.3	3,200	6-27	90	87
6	11	Small Lady	8.0	2,400	6-27	90	87
7	7	Whippoorwill	7.8	3,200	6-27	90	75
8	9	Powell's Early Prolific	7.5	2,800	6-27	90	87
9	5	Red Crowder	7.2	3,600	6-27	90	87
9	14	Halesteine	7.2	1,800	6-27	90	87
10	4	Iron	6.8	4,000	6-27	90	87
11	1	Red Ripper	6.7	4,800	6-27	90	87
12	10	Southdown	6.0	2,600	6-27	90	80
13	6	Small Black	5.8	3,400	6-27	90	75
14	13	Mealer's Clay	5.6	2,000	6-27	90	80
15	4	Brown Coffee	5 2	4,000	6-27	105	97
16	5	Michigan Favorite	4.7	3,800	6-27	105	87
17	6	Yellow Sugar Crowder	3.8	3,400	6-27	90	87
18	2	Clay	3.3	4,400	6-27	105	87
19	8	Clay Crowder	2.7	3,000	6-27	105	87


Clam.


Small Black

SUMMARY OF RESULTS OF VARIETY TESTS OF COWPEAS.

As stated above, the results of the yearly tests have been brought together in a table giving the summary or averages for the several years. This table includes the same data as the preceding ones, and, in addition, the number of peas to make a pound, which is a measure of the size of the individual peas, the color and shape of the peas, and the habit of growth of the several varieties, whether erect, half trailing or trailing. The rank of the several varieties according to productiveness of peas and hay has been arranged in groups according to the number of years tested. Those varieties which have been tested four years or more are included in the general averages and are given rank according to the amount of hay and peas each variety has yielded on an average during the years they have been grown. The other varieties have their averages for the number of years for which they have been grown and are not given rank in comparison with the others which have been grown for longer periods. In comparing varieties it is necessary that they should have been grown the same year and under the same conditions, as different seasons affect the yield very much, especially when planted late and follow grain, as was the case with most of our work.

The main uses of the cowpea are for the production of peas, of hay, for grazing and soiling, and for soil improvement. A study of the results in the several yearly tables and in the summary table reveals among others the following interesting facts:

Peas.—The yield of peas in the varieties included in the tests for four or more years range from 13.5 to 6.6 bushels per acre, the varieties in the order of productiveness being:

Whittle,
Small Black,
New Era,
Whippoorwill,
Sixty-day,
Red Crowder,
Southdown,
Iron,
Large Black Eye,
Powell's Early Prolific,
Small Black Eye,
Small Lady,
Red Ripper,
Yellow Sugar Crowder,
Mealer's Clay,
Michigan Favorite,
Clay,
Brown Coffee.

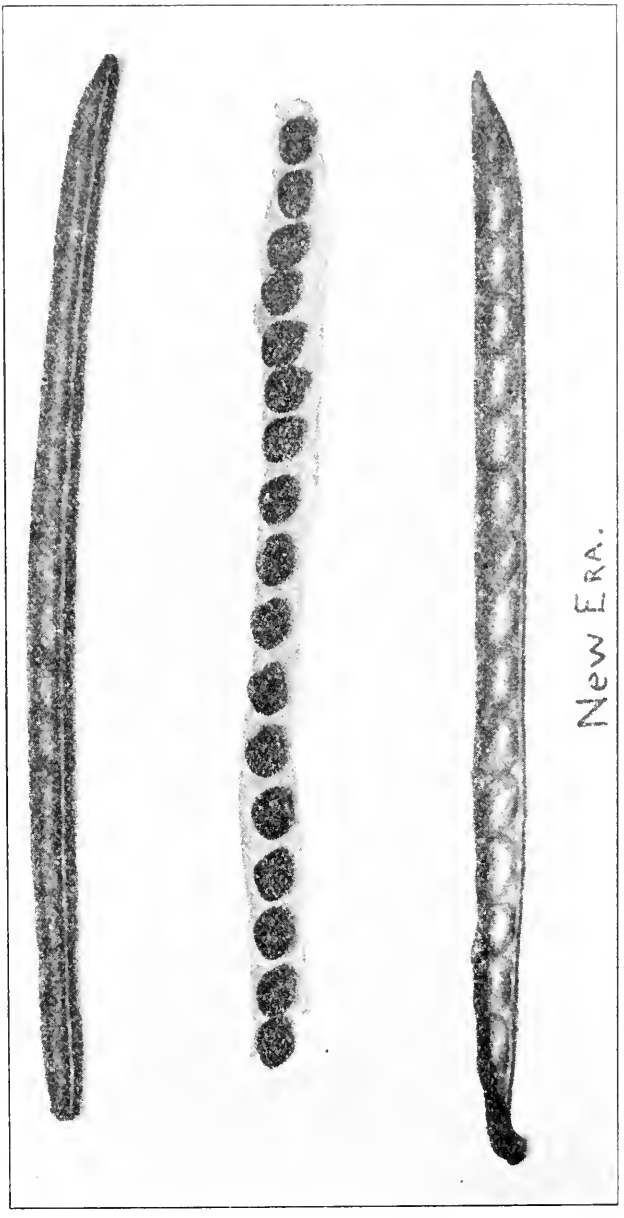
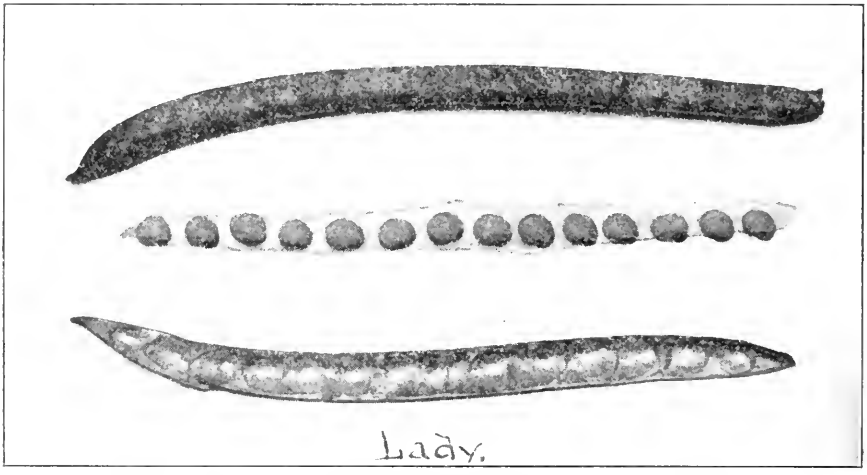

NEW ERA.

TABLE XIX—SUMMARY OF RESULTS OF VARIETY TESTS OF COWPEAS ON IREDELL TEST FARM IN 1903-'08.

Number of Years Tested.	Rank as to Productivity. Peas.	Rank as to Productivity. Hay.	Variety Tested.	Average Yield of Peas in Bushel of 60 Pounds per Acre.	Average Yield of Hay in Pounds per Acre.	Average Number of Days to Maturity. Peas.	Average Number of Days to Maturity. Hay.	Size of Seed—Number in Pound.	Color of Seed.	Shape of Seed.	Habit as to Growth of Plant.
6	1	9	Whittle	13.5	2,953	101	86	2,041	Grey mottled	Kidney	Half-trailing, holds leaves well.
6	2	8	Small Black	12.0	3,175	104	83	2,268	Black	Kidney	Vigorous, trailing, holds leaves poorly.
6	3	11	New Era	11.9	2,727	100	74	3,629	Brown speckled	Crowder	Half-trailing, sheds leaves early
5	4	4	Whippoorwill	11.7	3,424	100	83	2,494	Brown and blue	Kidney	Erect, sheds leaves early.
6	5	17	Sixty-day	11.6	2,487	99	82	2,268	Red	Kidney	Low, half-trailing, sheds leaves early.
6	6	5	Red Crowder	10.4	3,412	108	93	2,721	Red	Crowder	Vigorous, half-trailing, holds leaves poorly.
6	7	10	Southdown	10.3	2,838	109	88	2,721	Brown mottled	Kidney	Vigorous, half-trailing, holds leaves well.
6	8	1	Iron	9.9	3,872	102	83	3,856	Light brown	Crowder	Very vigorous, erect, holds leaves well.
6	9	15	Large Black Eye	9.8	2,560	106	88	1,814	White	Kidney	Low, half-trailing, holds leaves poorly.
5	10	13	Powell's Early Prolific	9.6	2,636	100	85	2,268	Red and clay	Kidney	Erect, holds leaves poorly.
6	11	14	Small Black Eye	9.2	2,609	103	88	2,494	White	Kidney	Vigorous, trailing, holds leaves poorly.
6	12	12	Small Lady	9.1	2,649	101	87	3,629	White	Crowder	Small and erect, holds leaves poorly.
6	13	6	Red Ripper	8.9	3,339	108	93	3,402	Red	Kidney	Vigorous, half-trailing, holds leaves poorly.
6	14	7	Yellow Sugar Crowder	8.6	3,179	110	93	2,260	Light yellow	Crowder	Small, half-trailing.
4	15	16	Mealer's Clay	8.1	2,500	106	79	.....	Clay	Crowder	Half-trailing, holds leaves poorly.
4	16	18	Michigan Favorite	7.9	2,400	110	85	2,041	Clay	Crowder	Half-trailing, holds leaves well.
6	17	2	Clay	7.0	3,688	111	93	3,402	Clay	Kidney	Very vigorous, tall and erect.
4	18	3	Brown Coffee	6.6	3,430	111	93	2,495	Brown	Kidney	Trailing, holds leaves well.
3	.....	.....	Brown-Eye Crowder	9.3	2,647	112	89	2,948	White	Kidney	Large, half-trailing, holds leaves well.

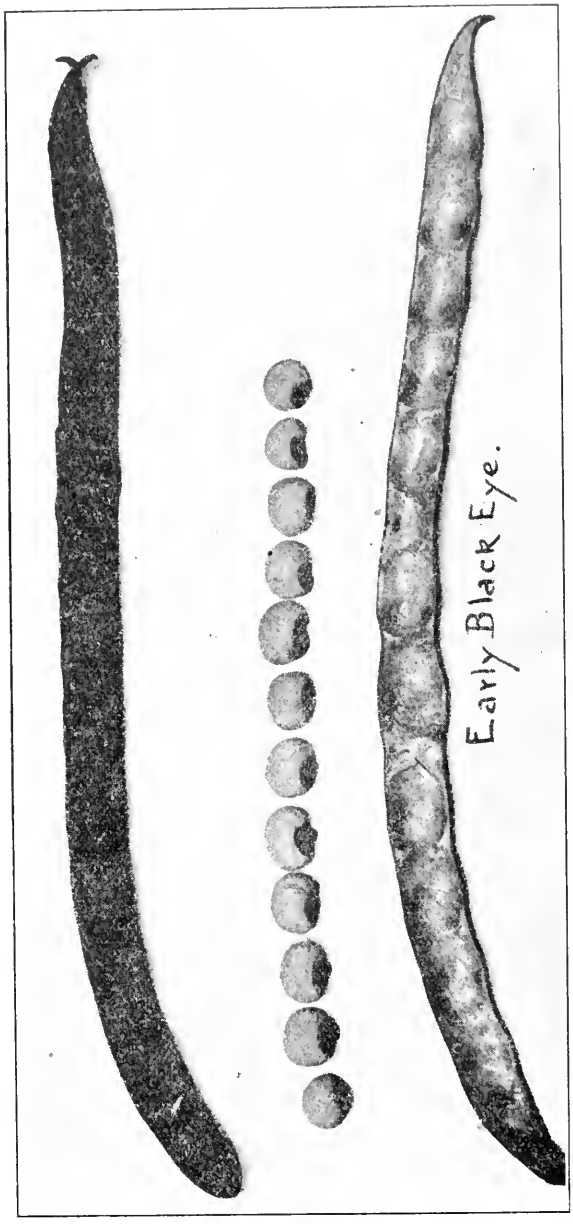
3	------	------	Unknown	8.8	5,200	121	87	------	Clay	Kidney	Trailing, holds leaves very well.
2	------	------	Chinese Brown Eye	12.7	2,240	120	75	------	White	Crowder	Half-trailing, holds leaves fairly.
2	------	------	Unknown Black	9.2	3,700	92	87	2,268	Black	Kidney	Erect, holds leaves fairly well.
2	------	------	Clay Crowder	8.3	3,060	99	87	1,814	Clay	Crowder	Trailing, holds leaves well.
2	------	------	Warren's New Hybrid	7.7	1,800	110	84	3,175	Clay	Crowder	Erect, holds leaves fairly well.
2	------	------	Black Crowder	6.3	2,200	120	85	------	Black	Crowder	Erect, holds leaves poorly.
2	------	------	Delicious	3.4	1,100	112	79	------	------	------	Erect, holds leaves poorly.
2	------	------	Chinese Red	3.3	1,100	112	77	------	Red	------	Erect, holds leaves poorly.
1	------	------	Chinese Whippoorwill	11.7	1,600	112	74	------	------	------	Erect.
1	------	------	Halesteine	7.2	1,800	90	87	------	------	------	Erect.
1	------	------	Warren's Extra Early	6.7	1,800	87	73	------	Brown	------	Erect.
1	------	------	Old Man	4.7	1,480	92	70	------	Brown	------	Erect.

The size of the seed vary from 1,814 to the pound in the case of the Large Black Eye to 3,856 in case of the Iron, there being more than twice as many peas in a pound or bushel of Iron than the Large Black Eye. This factor is not usually considered in determining the number of peas to plant to the acre, but should be, not so many peas of the small and medium sizes being necessary as of the large ones for the same area.



Hay.—The yield of hay in pounds per acre of the several varieties included in the test for four years and over vary from 3,872 pounds to 2,400 pounds, the rank in order of productiveness for hay being as follows:

Iron,
Clay,
Brown Coffee,
Whippoorwill,
Red Crowder,
Red Ripper,
Yellow Sugar Crowder,
Small Black,
Whittle,
Southdown,
New Era,
Small Lady,
Powell's Early Prolific,
Small Black Eye,
Large Black Eye,
Mealer's Clay,
Sixty-day,
Michigan Favorite.


Early Black Eye.

It should be said, however, that the largest yield of hay was produced from the Unknown, the average for three years being 5,200 pounds or 2.6 tons per acre, against a yield for the Iron, the highest yielder in the longer test period, of 3,872 pounds, or 1.9 tons hay per acre.

In addition to vigorous growth and large yield of hay, the character or habit of growth of the plant, whether erect, half erect, or trailing, and the difficulty or ease with which it sheds its leaves, need to be considered. The trailing varieties are difficult to cut and handle, while the erect and half erect ones can be mowed and the hay saved with much greater ease than the trailing kinds. Some varieties shed their leaves early or they drop with great ease after cutting for hay. The leaves are the richest part of the pea plant for hay and it adds greatly to the value of the hay variety for the leaves to remain long on the plant and to adhere tenaciously after cutting so that as few as possible of them will be lost. These facts are all given in the summary table and show

Iron,
Clay, and
Whippoorwill

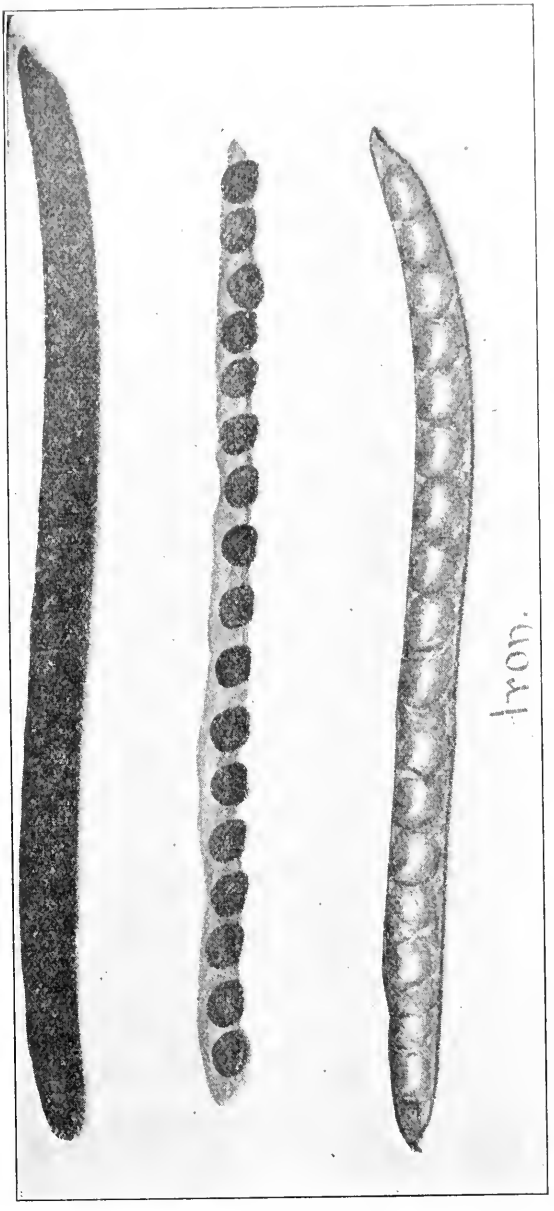
to be specially valuable hay varieties.

Peas and Hay.—For the production of both peas and hay the following are among the best varieties, according to our tests:

Whippoorwill,
Red Crowder,
Iron,
New Era.

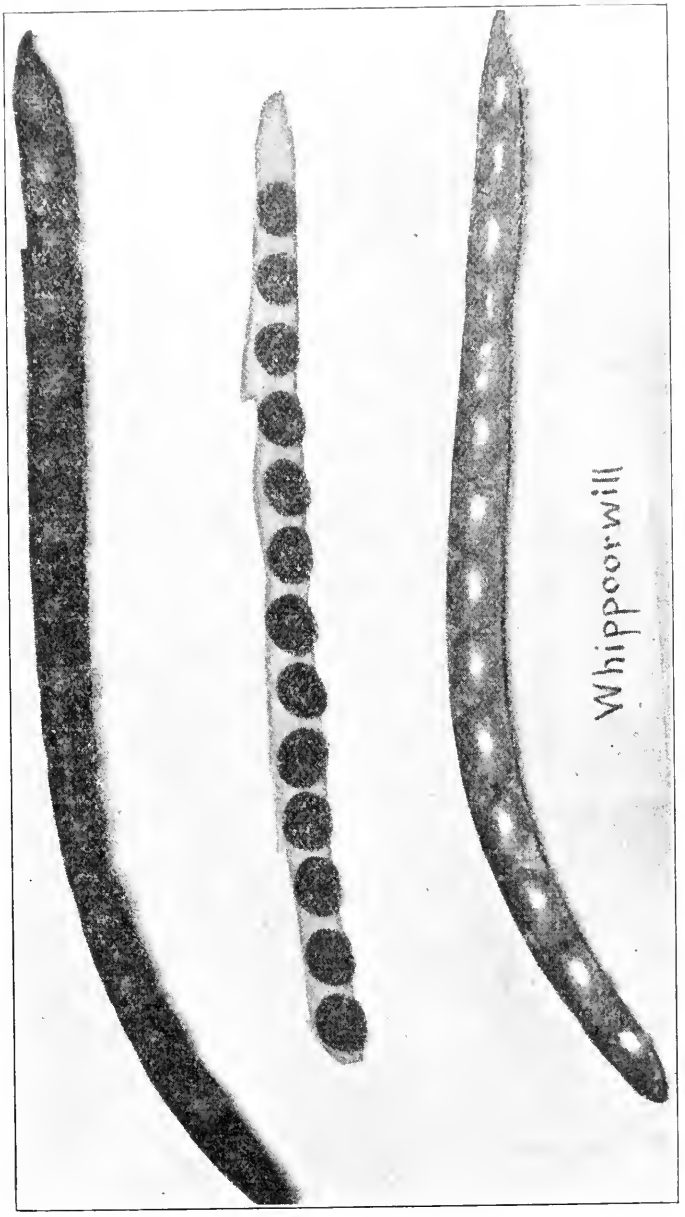
Grazing and Soiling.—Where hogs are to be grazed and fattened after the peas are largely mature the heavy pea-yielding varieties are desirable; while for soiling and grazing with other live stock the heavy hay and pea-yielding varieties are favorites.

Soil Improvement.—Now and then you will hear the idea put forward that the main part of the soil-improving and fertilizing value of the cowpea is the roots. Some people used to think that there would be as much improvement of the soil and increase in after crops from removing the hay as there would be if the entire plant were left. This is entirely erroneous. From 80 to 88 per cent of the fertilizing or soil-improving value of the cowpea is contained in the hay and peas which go with it, and 12 to 20 per cent remain in the roots and stubble. Different varieties vary in the proportions of hay and peas and roots and stubble. Our investigations now in progress include a further study of these questions for the purpose of


Iron.

throwing additional light on this phase of the problem of soil improvement from growing cowpeas. Since around 85 per cent of the soil-improving part of the cowpea is removed in the hay and peas, the large hay-producing varieties are the best for soil improvement. With this as our criterion, which is the correct one, the following varieties of peas are specially desirable for soil improvement:

Unknown.
Iron.
Clay.
Brown Coffee.
Whippoorwill.
Red Crowder.


Whippoorwill

III. CULTURE, FERTILIZATION, AND USES OF THE COWPEA.

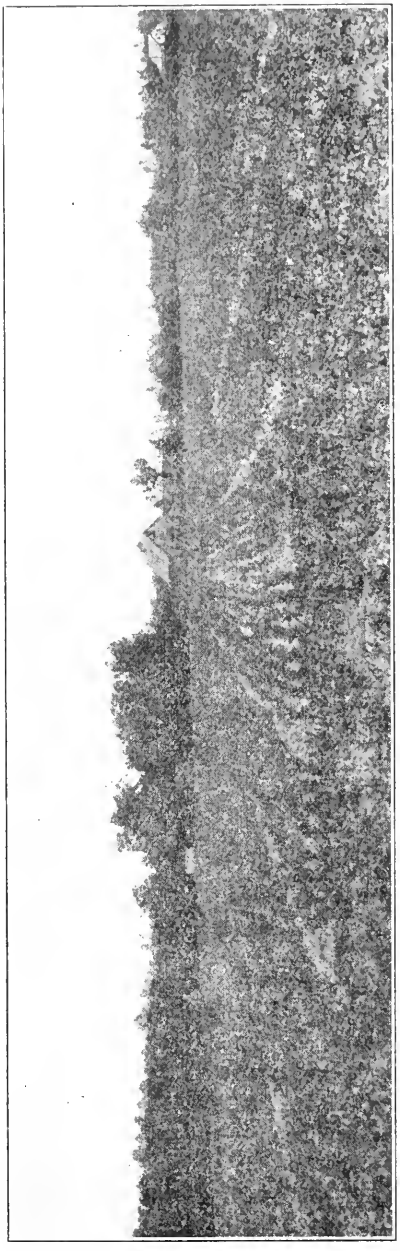
Preparation and Cultivation.—The cowpea will thrive under very unfavorable conditions of soil and preparation, except where the land is wet and cold. Where peas follow grain or other crops it is practically impossible in many cases to break and prepare the land well, on account of season and pressure of other work, and under these conditions they should be put in in the best way possible and will usually pay well for the expenditure, even under unfavorable conditions. While the above is true, there is no plant that delights more in a thoroughly broken and well-prepared soil or that returns greater profits for the expense and time in putting the soil in good condition before planting.

The cowpea and other leguminous plants are of more value for soil improvement than plants not belonging to this class, because they are able, through the bacteria that live on and in nodules on their roots, to gather a portion or all of their nitrogen from the air and use it in their growth. This nitrogen is taken from the air, which circulates in the soil and which comes in contact with the roots of the plant. The more deeply and thoroughly the soil is prepared the greater will be the root development of the cowpea or other plant, and the more air will circulate in the soil, thus enabling the crop to make a greater growth and accumulate more nitrogen for its own use and for the use of crops of corn, cotton, and grains which follow.

Peas may be planted broadcast or drilled with a grain drill, when one bushel per acre is a good quantity of seed; or they may be put out in rows 2½ to 3½ feet apart, when one-half bushel per acre will give good results. When planted in rows peas should be cultivated two to three times with weeder, harrow, or cultivator. The extra growth of crop and increase of nitrogen gathered from the air give profitable returns for the cultivation.

The size of seed of the different varieties of peas vary, some being twice as large as others, and it is not necessary to use so large a quantity of the small as of the large seeded kinds. The following table gives the results of three years' test of different quantities of seed in 3⅓-foot rows, the variety used being the New Era, the seed of which are small. These results show one-half bushel in rows of the above width to be a good seeding.

Fertilization.—As the cowpea is able to get a portion of its nitrogen from the air, it is not necessary on soils in fair to good condition to supply this constituent in fertilizers for this crop. Our experiments presented in this report confirm this view. Other experi-



COWPEAS DRILLED WITH GRAIN DRILL.

ments and observations indicate that where nitrogen is supplied in the fertilizer or is contained in too great abundance in the soil, the cowpea may become lazy and is not as active in extracting nitrogen from the air as when it is necessary for it to obtain it from this source for its growth. On poor soils, where the plants start slowly and are sickly in appearance, it is profitable to add a small amount of nitrogen in the fertilizer, or as a side dressing, to produce growth to the point where the root development will enable the peas to get the nitrogen they need from atmospheric sources.

TABLE XX—TEST OF DIFFERENT QUANTITIES OF SEED USED PER ACRE (NEW ERA).

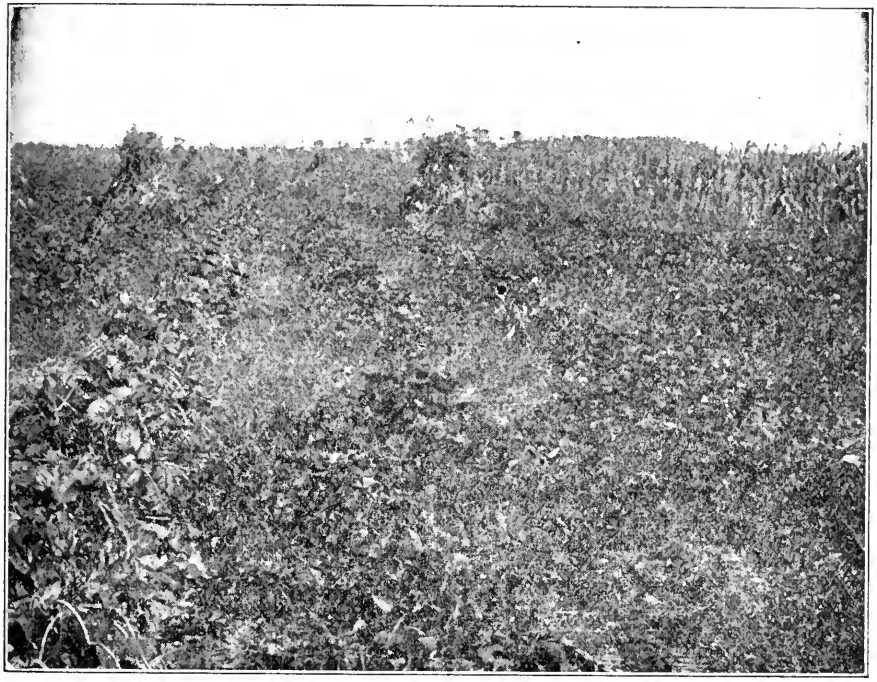
No. of Plat.	Bushels of Seed Used per Acre.	Yield of Peas in Bushels per Acre.			Yield of Hay in Pounds per Acre.			Average for Two Years of Peas in Bushels per Acre.	Average for the Three Years of Hay in Pounds per Acre.
		1904.	1905.	1906.	1904.	1905.	1906.		
1	.25	5 00	15 33	*.....	1,480	4,800	2,090	6.77	2,790
2	.50	9.33	10 33	*.....	2,600	4,600	2,400	6.55	3,000
3	.75	9 50	14 16	*.....	2,400	3,600	2,120	7.88	2,706
4	1 00	10 00	13 00	*.....	2,800	3,200	2,080	7.66	2,693
5	1.50	11 00	13 66	*.....	2,520	3,400	2,280	8.22	2,733

*Peas rotted in field as a result of continued rains.

On soils needing lime, because they are deficient in it, or where they need lime to correct sourness, or acidity, it should be applied.

The two important fertilizer constituents for the cowpea are phosphoric acid and potash, and it pays to supply these liberally, either combined or singly, according to the needs of the soil, as the plant cannot make a satisfactory growth and add to the fertility of the soil without them. A ton of pea-vine hay, in round numbers, removes from the soil 47 pounds nitrogen, 10 pounds phosphoric acid, and 29 pounds potash, and 1 bushel of peas with the hulls going with them (85 pounds) removes 2.3 pounds nitrogen, .6 pound phosphoric acid, and 1.4 pounds potash. At least sufficient phosphoric acid and potash should be supplied in the fertilizer to return what is removed in the crop, and considerably more if it is expected to keep up the productiveness of the land by supplying the waste from washing and leaching. Our experiments already reported on the red-clay loam of the Iredell Test Farm show that this soil does not need potash for pea production. The analysis of the soil shows it to be comparatively high in potash. Our analyses of red (cecil) clay

loams from other parts of the piedmont, red (cecil) clays, and valley lands prove them to be as rich or richer in potash than the soils on which we experimented. We therefore feel safe in concluding that these piedmont soils, which make up the main farming area of the piedmont section of the State proper, do not need potash for growing peas. In like manner, analyses of the valley and main upland soils of the mountains show them to be high in potash; and experiments with other crops on the Buncombe Farm on high potash soils do not respond, to any considerable extent, at least, to applications of potash. For the present, at least, and until contradictory evidence is



Cowpeas in Corn.

obtained, we feel that we are safe in advising that potash is not necessary in the growth of peas on the soils referred to above in the piedmont and mountain districts of the State. This is likely true, also, of the clovers and other leguminous crops. This should mean no small saving to the farmers growing this crop on these soils. The yield of hay on the Iredell Farm varies from less than a ton to more than three tons per acre, according to season and variety. Three tons of hay would remove 30 pounds phosphoric acid, which would be almost returned by 200 pounds 14 per cent acid phosphate.

Our best results were obtained from 300 to 500 pounds of acid phosphate. We would therefore suggest the following fertilization for piedmont red clay, red-clay loam, and valley soils and mountain, valley and main upland soils:

FOR LAND IN FAIR TO GOOD CONDITION.

Acid phosphate, 14 per cent.....300 to 500 pounds.

Three hundred pounds would contain 42 pounds phosphoric acid and 500 pounds 70 pounds phosphoric acid. Acid phosphate of other grades can be used to supply these amounts of phosphoric acid.

FOR POOR LAND.

Acid phosphate, 14 per cent.....300 to 500 pounds.
Dried blood ..... 30 to 50 pounds.

In case acid phosphate has been used and it is found that the peas are not making a satisfactory start, a side dressing of 50 to 75 pounds nitrate of soda may be applied to advantage.

FOR SANDY AND SANDY-LOAM SOILS OF THE COASTAL PLAIN AND PIEDMONT.

The sandy and loam soils of the eastern or coastal plain section of the State, and of the piedmont, as a rule, contain much less potash than the soils referred to above, though they are richer in potash than in phosphoric acid. Our experiments have not gone far enough to enable us to advise regarding these soils in the definite way that we can regarding the red-clay loam and similar soils of the piedmont and mountains, as regards fertilizer for peas. We have, therefore, to use our best judgment and our own and the observations of farmers in suggesting fertilizers for this crop on these soils.

FOR LAND IN FAIR TO GOOD CONDITION.

Acid phosphate, 14 per cent.....300 to 500 pounds.
Kainit .....150 to 250 pounds.

This mixture would contain available phosphoric acid, 9.3 per cent; potash, 4 per cent. Other potash salts can take the place of kainit, the muriate especially being cheaper. One pound of muriate potash is equal in fertilizing value to four pounds of kainit.

FOR POOR LAND.

Acid phosphate, 14 per cent.....300 to 500 pounds.
Kainit .....150 to 250 pounds.
Dried blood ..... 30 to 50 pounds.

USES OF THE COWPEA.

The main uses of the cowpea are for grazing and soiling, hay and soil improvement.

Grazing and Soiling.—The cowpea is largely grown in the South for grazing hogs, especially, as well as other animals; its use for this purpose being more appreciated and extended from year to year. Cattle, sheep and like animals must become accustomed to it and be put on it gradually before they are allowed full pasture, or bad results may follow. It is used for soiling with excellent results, and to some extent for silage when grown with corn. The richness of the green pea-vines and leaves, green and ripe peas in protein, or muscle and lean meat and milk-producing constituents, make it a most valuable plant for these purposes. Where hogs are to be grazed and fattened on the peas, the Whittle is one of the best varieties, as it produces a large yield of peas of large size. Small Black, New Era, and Whippoorwill are also good varieties.

Hay.—Pea-vine hay is difficult to cure, especially if the weather is not favorable. Different methods or modifications of methods are followed in different sections with greater or less success. Where an individual has found a particular plan to be successful, or where he knows that a method followed by some one else has given satisfactory results, it is well to follow it, though there are a number of standard ways of handling the crop and which are generally known to growers of peas. Our only suggestion here is that it be handled as little as possible, as the leaves of many of the varieties drop easily, and outside of the peas in pod the leaves are the most valuable part of the hay. Pea-vine hay ranks in feeding value with the clovers, vetch, and other leguminous hays, and is practically equal in feeding value to wheat bran for what is eaten by the animal. By this is meant that animals will not, especially where the stems are tough, eat up clean all of the hay, but what is eaten is equal in milk and butter and growth-producing value, pound for pound, to wheat bran. If ground, as it might be, as alfalfa is at present, to produce pea-hay or pea-vine meal, it should sell as readily on the market and at practically the same price as wheat bran, which is now more than $30 per ton. This is a possible profitable industry for sections of the South where feeds are high, which is almost everywhere, and where pea-vine hay is grown in large quantity. It has a much higher feeding value than the grass and similar hays and we cannot better show its merit than by comparison with wheat bran, which is universally recognized as a feed of general usefulness and high merit.

The following table shows the comparative composition and feeding value of pea-vine hay and wheat bran:

TABLE XXI—SHOWING PERCENTAGE COMPOSITION AND COMPARATIVE FEEDING VALUE OF COWPEA-VINE HAY AND WHEAT BRAN.

	Protein.	Fat.	Nitrogen-Free Extract.	Fiber.
Cowpea-vine hay	14.9	2.6	41.2	21.5
Wheat bran	15.0	4.0	53.9	9.0

The table below shows the comparative fertilizing and manurial value of one ton each pea-vine hay and wheat bran:

TABLE XXII—SHOWING NUMBER OF POUNDS OF PHOSPHORIC ACID, POTASH, AND NITROGEN IN ONE TON PEA-VINE HAY AND WHEAT BRAN AND VALUES PER TON.

	Amounts—Pounds.			Values per Ton.			
	Nitrogen.	Phosphoric Acid.	Potash.	Nitrogen.	Phosphoric Acid.	Potash.	Total.
Cowpea-vine hay	47.6	10.4	29.4	$ 8.57	$ .52	$ 1.47	$ 10.56
Wheat bran	52.0	56.0	32.0	9.36	2.80	1.60	13.76

A study of the results of the variety tests already presented will show the ones which are specially desirable for hay, among them being the following:

Iron,
Unknown,
Clay,
Brown Coffee,
Whippoorwill,
Red Crowder,
New Era.

SOIL IMPROVEMENT.

The cowpea is likely grown more largely for soil improvement than for all other purposes combined, and if it has a use greater than for soil improvement, it is second only to its feeding value, which has already been seen to be high.

Nitrogen is the most costly constituent in fertilizers. The cowpea is able to get its supply of this constituent from the inexhaustible supply of nitrogen in the air. This nitrogen is taken from the air circulating through the soil spaces by the very minute, microscopic organisms living on and in the nodules, warts, or enlargements on the roots of the cowpea plant. These nodules are the home of the bacteria and are shown in the cut on another page. Corn, cotton and the

grains are not able to thus get nitrogen from the air, but must be supplied with it through fertilizers or from the cowpea and other leguminous plants, after they have obtained it and used it in their growth and have decayed in the soil. One ton of pea-vine hay contains in round numbers 47 pounds nitrogen, the greater portion, or all, of

NODULES ON COWPEA ROOTS, WHERE NITROGEN-GATHERING BACTERIA WORK.

which it has obtained from the air, and if left on the soil or turned under, this amount of nitrogen, corresponding to more than 700 pounds cotton-seed meal, is added to the soil for soil improvement and for the growth of other crops. The yield of pea-vine hay on fair land varies from one to three tons and the amount of nitrogen thus collected and stored in the soil is seen to be large, and in addition to this must be considered the value of the organic matter in improving the texture and physical condition of the soil.

The question frequently arises as to whether or not it is best to cut and use the vines for hay or allow them to remain on the soil for its improvement. The feeding value of the hay needs to be considered in this connection, as the feeding value can be obtained and under the most favorable conditions 70 to 80 per cent of the fertilizing value be returned to the soil in the manure. This is seldom accomplished, however, with the methods followed for saving and handling manure. In most cases likely not over 50 per cent and generally much less than this finds its way back to the land. If the improvement of the land is the sole or main question, there can be but one answer, and that is to leave the entire crop on the soil. In addition to the 47 pounds of nitrogen, there are in a ton of pea-vine hay 10 pounds phosphoric acid and 29 pounds potash, which would be worth, at the present prices for these three constituents in fertilizers, namely, 18 cents per pound for nitrogen, 5 cents per pound each for phosphoric acid and potash, $10.56 per ton. These constituents average around 85 per cent of the entire fertilizing value of the pea crop, which is made up of hay, roots, and stubble, the roots and stubble containing on an average about 15 per cent of the fertilizer constituents of the cowpea crop. Good crops of cowpeas grown on land and left there will improve it rapidly, but if the hay is removed and exhausting crops are planted in rotation the productiveness of the soil will be but slightly increased or not at all, unless judicious fertilization is followed.

Turning under large crops of cowpeas in the fall, to be followed by small grain, frequently results in disappointment because of reduced yield in comparison with land which did not have the peas. This is due to the habits of growth of the small grain, which require a compact soil. The peas leave the soil too open and porous. This interferes with root development and water-holding capacity. If the crop is handled properly this difficulty will not be encountered. On heavy land small crops of peas may be turned under green and greatly improve the texture of the soil, besides the addition of the fertilizer constituents of the pea. The safest way with moderate size and large crops is to cut them with a disk harrow or some other implement, allow them to wilt or even dry on the soil, and then turn them under. On light soils the trouble is likely to be more serious, and here it is especially necessary to either cut up large crops or else allow them to remain on the soil until after frost and even into the winter or early spring. On heavy, as well as light land, this practice is good, as the vines will then become at least partially decomposed and can be turned under during the winter or before planting in the spring. There may be some loss from remaining on the surface, but this will in all likelihood be overcome if not exceeded by prevention from washing.

The large hay-yielding varieties, as the Iron, Clay, Unknown, and Whippoorwill, are best suited for soil improvement.

LEAF TOBACCO SALES FOR APRIL, 1910.

Pounds sold for producers, first hand	1,499,769
Pounds sold for dealers	69,650
Pounds resold for warehouses	99,482
Total	1,668,901

LEAF TOBACCO SALES FOR MAY, 1910.

Pounds sold for producers, first hand	1,179,399
Pounds sold for dealers	32,815
Pounds resold for warehouses	88,679
Total	1,300,893

SUPPLEMENT TO JUNE BULLETIN, 1910.

North Carolina Department of Agriculture.

SPECIAL BULLETIN.

JULY AND AUGUST

WORK IN SELECTING SEED CORN.

BY

W. A. GRAHAM,

COMMISSIONER.

PUBLISHED AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Stroud	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

SELECTING SEED CORN.

WORK FOR JULY AND AUGUST.

(Republished June, 1910.)

Corn is the basis of farm operations in this State. That it is more profitable for the farmer to produce a sufficient supply on his farm than to raise other crops, from the receipt of sales of which to purchase it, is generally admitted. Usually the farmer who has corn to sell each year has money to lend, and the farmer who buys corn each season to run his farm generally wishes to borrow money to pay for it. The Department of Agriculture desires to induce the farmers to recognize these evident facts, which have so vividly impressed themselves upon our history, and thus emerge from the condition of debt and humiliation, so common among them, by producing at least the corn needed upon each farm.

In 1897 the farmers in the "Corn Belt," as it is generally called—viz., Ohio, Indiana, Illinois, Wisconsin, Kansas and Iowa—realized that the production of corn per acre was hardly half what it was twenty years prior thereto. The agricultural associations began an investigation of the subject, and afterwards corn growers' associations were formed in each State to consider solely the subject of the production of seed corn.

This paper is intended to present some of the developments along this line, as shown by their conclusions. Every grain of corn in embryo (at first) produces a strand of silk, which comes through the shuck at the end of the ear. In order to complete this grain some of the pollen or dust from a corn tassel must get on this silk and convey its vitality to the grain. If this is not done, the grain shrivels and fails to be perfected. The stalk from which the pollen is received determines in a large measure the kind of grain produced. The ear is the mother, the tassel the father of the grain of corn. As in the case of animals, it was seen that a good type or basis was necessary to produce a desired individual, and that there must be a recognized ear of corn as the example of what was desired. Many of the readers of this paper, like the writer, have selected seed corn every year—some for near fifty years. But to-day, while the corn in their cribs may be all sound and marketable, there are a dozen or perhaps twenty different types. One of these is best, or perhaps combining two into a new type would be better. The associations fixed on certain types and have bred to them. The small grains (wheat, oats and rye) brought into this State from the Middle States generally give the best

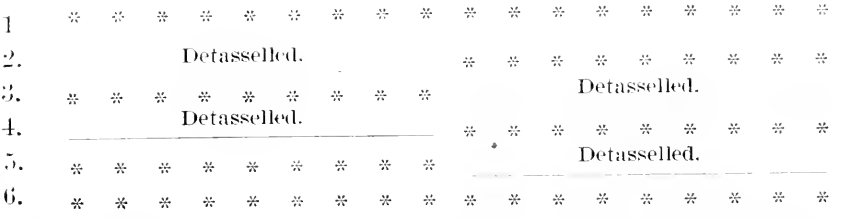
crop the first season, but deteriorate in a few years. This has been the experience of the writer. Corn does not do this if carefully selected, but continues to improve after the first crop. We shall have to take varieties best suited to the different sections of the State and endeavor by selection to improve upon them.

1. Crossbreeding. 2. Inbreeding.

Our Western friends report that "inbreeding" in corn is as undesirable and degenerating as in animals. The Department of Agriculture of Kansas, in 1903, published a bulletin on this subject. By

the kindness of Mr. F. D. Coburn, secretary of the Board of Agriculture of Kansas, I present a picture of the result of five years of inbreeding and crossbreeding.

To prevent inbreeding was one of the first steps taken after choosing the type. Last spring, through the newspapers, I requested those interested to plant six ears of corn in six parallel rows. Corn will soon be shooting and tasselling. To prevent inbreeding or the pollen from the tassel fertilizing altogether the silk on the ear of the same stalk, just as the tassel appears cut out every tassel on one-half of row No. 2; then get over on row No. 3 and cut every tassel to the end of it; then at that end begin on row No. 4 and cut tassels halfway back; then change to No. 5 and cut to the end, as follows:



Then go through the corn that has not been detasselled and detassel every barren or undesirable stalk (that is, every one that has no ear upon it). If you desire a variety of more than one ear to the stalk, then detassel all the stalks having less than two ears. If a stalk has its ears too high and tends to produce too much stalk, then detassel these, and thus fix the desired type.

Where you have a field of one kind of corn you might select any portion of it for your seed patch and treat it as recommended for the six rows above. Detasselling should be done as soon as the tassel appears.

BARREN STALKS.

Barren stalks are said to produce a greater amount of pollen, therefore should be promptly removed, or the pollen will cause the shoots upon the good stalks to produce ears that will bring other barren stalks.

Barren stalks were found to be perhaps more detrimental than inbreeding. The loss from such cause is no surmise or guesswork, but can be easily proven. Go through a row of corn, count the barren stalks as compared to those bearing ears, and you have the proportion of loss. If you and a neighbor are passing through your or his field, let each of you take two rows and count as above, and then calculate what would be the increase if every stalk bore an ear. You have the stalk, and your fertilizer and land are taxed to produce it. All that is lacking is the ear. This loss was reported to be at least

one-third, but has been reduced to less than 10 per cent in five years. If you find a stalk of corn you deem desirable for seed, detassel all undesirable stalks within ten feet of it, or you may have for your seed the very stalk you deem most undesirable. Careful attention to this matter will do much to increase the quality and quantity of corn in this State next year.

SCORE-CARD FOR JUDGING CORN.

The associations determined the points desired in an ear of corn of a specified type, and arranged them in groups of 100 points, to be used in judging corn. The score-cards are not uniform in all the States. The following table shows the cards of the respective States named:

	Missouri.	Mississippi.	Texas.	Illinois.	Kansas.	Ohio.	Iowa.	Indiana.	Nebraska.	Pennsylvania.	Wisconsin and Maine.
1 Uniformity of exhibit	15	5	5	5	10	----	5	10	5	10	----
2 Maturity and market condition	10	10	10	----	5	----	10	5	5	10	10
3 Purity as shown by color kernel	5	5	10	10	10	10	5	10	10	5	5
4 Purity as shown by color cob	5	5	5	----	----	----	----	----	----	5	5
5 Shape of ear	10	10	10	10	5	10	10	5	5	5	10
6 Proportion length and circumference	10	----	5	----	----	----	----	----	----	----	----
7 Butts	5	5	5	5	5	5	5	5	5	5	5
8 Tips	5	5	5	5	10	5	5	10	10	5	5
9 Space between rows	5	5	5	5	10	----	5	----	5	5	5
10 Per cent corn to ear	10	10	15	10	20	10	10	20	20	15	10
11 Trueness to type	----	10	5	10	----	10	10	----	10	5	10
12 Space between rows at cob	----	5	5	5	----	10	5	10	----	----	5
13 Grains—(*a*) shape	5	10	5	5	5	5	5	5	5	10	5
(*b*) uniformity	5	5	5	5	5	5	10	5	5	10	10
(*c*) germ	10	----	5	10	----	20	----	----	----	----	----
14 Length of ear	5	5	10	10	10	5	10	10	10	5	10
15 Circumference	----	5	----	5	5	5	5	5	5	5	5
	100	100	100	100	100	100	100	100	100	100	100

NORTH CAROLINA SCORE-CARD.

The following score-card was approved by the North Carolina Board of Agriculture at its session June 9, 1910, for use in corn-judging contests in North Carolina:

	Points.
Uniformity of exhibit	10
Maturity and market condition	15
Trueness to type	10
Shape of ear	5
Purity as shown by color of cob	5
Purity as shown by color of kernel	5
Butts	5
Tips	5
Space between rows	5
Per cent shelled corn to ear	15
Grains—(*a*) shape	5
(*b*) uniformity	5
Length of ear	5
Circumference	5
	100

This card will be used in all contests conducted under jurisdiction of the North Carolina Department of Agriculture.

At the farmers' institutes this summer and at the fairs this fall and especially at the meetings of the alliances and Farmers' Union, I hope this question will be considered and conclusions published in the papers, and afterwards the matter referred to competent authority to determine what shall be the provisions of the score-card.

Next fall and winter it is proposed to have numerous corn-judging demonstrations, so that the farmers shall be made familiar with the various points obtainable on this subject. Our Western friends have two causes for anxiety about their seed corn which give us but little concern: First, injury to the seed by cold weather; second, failure to germinate. While the latter deserves attention, it is not often that we suffer from this, further than a reduction of the stand.

This paper is published for the information of our farmers, and I hope they will give careful attention. While corn is the basis of our operations, yet a farmer should not forget the small-grain crops, nor crimson clover and vetch for pasture and winter cover crops. Where you have land in peas this summer, if it is at all thin do not cut the peas, but in September disc the ground into good condition and sow crimson clover and vetch, covering with a light weeder; then follow with corn next spring, after the crimson clover is ripe, and repeat the sowing of peas and crimson clover.

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. JULY, 1910. Number 7.

I. ANALYSES OF FERTILIZERS { FALL SEASON, 1909. / SPRING SEASON, 1910.

II. ANALYSES OF COTTON-SEED MEAL.

III. REGISTRATION OF FERTILIZERS.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.
G. B. Walker	Assistant to Director Test Farms.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, N. C., July 14, 1910.

SIR:—I submit herewith analyses of fertilizers and cotton-seed meals made in the laboratory of samples collected during the past fall and spring. These analyses show fertilizers and meals to be about as heretofore and to be generally what was claimed for them. This material has been published heretofore as the JULY BULLETIN of the Department, and I recommend that it be issued as the JULY BULLETIN.

Very respectfully,

B. W. KILGORE,
State Chemist.

To HON. WILLIAM A. GRAHAM,
Commissioner of Agriculture.

I. ANALYSES OF FERTILIZERS, FALL SEASON, 1909; SPRING SEASON, 1910.

By B. W. KILGORE,
W. G. HAYWOOD, J. M. PICKEL, J. Q. JACKSON AND W. H. STROWD.

The analyses presented in this BULLETIN are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during fall months of 1909 and the spring months of 1910. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the BULLETIN with the claims made for the fertilizers actually used, the farmer can know by or before the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

TERMS USED IN ANALYSES.

Water-soluble Phosphoric Acid.—Phosphate rock, as dug from the mines, mainly in South Carolina, Florida and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural, state the phosphate has three parts of lime united to the phosphoric acid (called by chemists tri-calcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

Reverted Phosphoric Acid.—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

Available Phosphoric Acid is made up of the water-soluble and reverted; it is the sum of these two.

Water-soluble Ammonia.—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-seed meal, dried blood, tankage, and fish scrap. The first two of these (nitrate of soda and sulphate of ammonia) are easily soluble

in water and become well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

Organic Ammonia.—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay, will determine the quickness of their action as fertilizers. With short season, quick-growing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion, or all, of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

Total Ammonia is made up of the water-soluble and organic: it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

FORM OF POTASH IN TOBACCO FERTILIZERS.

Tobacco growers are becoming yearly more disposed to know the form of potash, whether from kainit, muriate or sulphate, which enters into their tobacco fertilizers. Considerable work of this kind has been done for individuals, and we now determine the form of potash in all tobacco brands, for the benefit of tobacco growers.

The term potash from muriate, as reported in the analyses, does not mean, necessarily, that the potash was supplied by muriate of potash. Sulphate or some other potash salt may have been used, but in all fertilizers where the term potash from muriate is used, there is enough chlorine present to combine with all the potash, though it may have come from salt in tankage, kainit, or karnalite. As the objection to the use of muriate of potash in tobacco fertilizers arises from the chlorine present, it does not matter whether this substance is present in common salt or potash-furnishing materials.

The use of sulphate of potash where there is chlorine present in the other ingredients of the fertilizer will not prevent the injurious effect of the chlorine. The term potash from muriate in our analyses,

therefore, means that there is sufficient chlorine present in the fertilizer from all sources to combine with the potash to the extent indicated by the analyses.

VALUATIONS.

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid and potash in the materials supplying them. These values are only approximate, as the cost of fertilizing materials is liable to change as other commercial products are, but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacturers.

Relative value per ton, or the figures showing this, represents the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid and potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

VALUATIONS FOR 1909.

In Unmixed or Raw Materials.

For phosphoric acid in acid phosphate.....	4	cents per pound.
For phosphoric acid in bone meal, basic slag and Peruvian guano.....	3½	cents per pound.
For nitrogen	18	cents per pound.
For potash	5	cents per pound.

In Mixed Fertilizers.

For phosphoric acid.....	4½	cents per pound.
For nitrogen	19½	cents per pound.
For potash	5½	cents per pound.

The valuations decided on this season, for reasons already given, are:

VALUATIONS FOR 1910.

In Unmixed or Raw Materials.

For phosphoric acid in acid phosphate.....	4	cents per pound.
For phosphoric acid in bone meal, basic slag and Peruvian guano.....	3½	cents per pound.
For nitrogen	18	cents per pound.
For potash	5	cents per pound.

In Mixed Fertilizers.

For available phosphoric acid	4½ cents per pound.
For nitrogen	19½ cents per pound.
For potash	5½ cents per pound.

HOW RELATIVE VALUE IS CALCULATED.

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8—2—1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

Percentage, or Lbs. in 100 Lbs.	Value Per 100 Lbs.	Value Per Ton, 2,000 Lbs.
8 pounds available phosphoric acid at 4½ cents	0.36 ×20=	$7.20
2 pounds potash at 5½ cents	0.11 ×20=	2.20
1.65 pounds nitrogen at 19½ cents	0.321×20=	6.42
Total value	0.791×20=	$15.82

Freight and merchant's commission must be added to these prices. Freight rates from the seaboard and manufacturing centers to interior points are given in the following table:

FREIGHT RATES FROM THE SEABOARD TO INTERIOR POINTS.—From the Published Rates of the Associated Railways of Virginia and the Carolinas. In car-loads, of not less than ten tons each, per ton of 2,000 pounds. Less than car-loads, add 20 per cent.

Destination.	From Wilmington, N. C.	From Norfolk and Portsmouth, Va.	From Charleston, S. C.	From Richmond, Va.
Advance	$ 3.20	$ 3.20	$ 3.40	$ 3.20
Apex	2.70		3.80	3.00
Asheboro	3.20	3.20	3.60	3.20
Asheville	4.00	4.00	4.00	4.00
Chapel Hill	2.95	3.20	3.90	3.20
Charlotte	2.65	3.20	2.85	3.20
Clayton	2.48	2.86	3.63	2.80
Cherryville	3.85	3.60	3.40	3.63
Clinton	1.60	3.00	3.20	3.00
Creedmoor	3.00	3.00	3.80	3.00
Cunningham	3.00	2.40	4.00	2.40
Dallas	3.00	3.60	3.40	3.60
Davidson College	3.00	3.20	2.20	3.20
Dudley	1.70	3.00	3.20	3.00
Dunn	2.00	2.80	3.20	2.80
Durham	2.80	2.83	3.20	2.83
Elkin	3.60	3.20	3.60	3.20
Elm City	2.10	2.60	3.20	2.60
Fair Bluff	1.60	3.80	2.40	3.80
Fayetteville	1.80	3.00	3.00	3.00
Forestville	2.85	3.00	3.80	3.06
Gastonia	3.12	3.25	3.12	3.25
Gibson	2.10	3.50	2.10	3.50
Goldsboro	1.80	2.80	3.20	2.80
Greensboro	2.96	3.00	3.40	3.00
Hamlet	2.00	3.00	3.60	3.00
Henderson	3.00	2.83	3.55	2.83
Hickory	3.20	3.60	3.20	3.60
High Point	3.00	3.08	3.40	3.08
Hillsboro	2.88	2.88	2.68	2.88
Kernersville	3.00	3.00	3.40	3.00
Kinston	2.10	2.80	3.50	2.80
Laurel Hill	1.90	2.40	3.80	3.40
Laurinburg	1.90	3.40	3.80	3.40
Liberty	2.72	3.60	3.80	3.60
Louisburg	2.95	3.00	3.80	3.00
Lumberton	1.60	3.60	3.70	3.60
Macon	3.05	3.00	3.85	3.00
Madison	3.00	3.00	3.40	3.00
Matthews	2.60	3.20	3.20	3.20
Maxton	1.80	3.40	2.70	3.40
Milton	3.44	2.40	4.00	2.40
Mocksville	3.36	3.20	3.40	3.20
Morven	2.55	3.60	2.50	3.60
Mount Airy	3.20	3.40	3.80	3.40
Nashville	2.30	2.90	3.40	2.90
New Bern	1.25	1.75	3.95	1.75
Norwood	3.68	3.20	3.20	2.23
Oxford	3.04	2.83	3.55	2.83
Pineville	2.77	3.25	3.00	3.20
Pittsboro	2.60	3.30	4.10	3.30
Polkton	2.40	3.00	2.20	3.00
Raleigh	2.56	2.83	3.40	2.83
Reidsville	3.00	2.96	3.40	2.36
Rockingham	2.10	3.00	3.80	3.00
Rocky Mount	2.20	2.50	3.40	2.50
Ruffin	3.28	2.80	3.40	2.20
Rural Hall	3.28	3.20	3.60	3.20
Rutherfordton	3.05	3.65	3.05	3.65
Salisbury	3.25	3.20	3.20	3.20
Sanford	2.10	3.00	3.40	3.00
Selma	2.10	2.80	3.20	2.80
Shelby	2.90	3.60	3.90	3.60
Siler City	2.60	3.60	3.80	3.60
Smithfield	2.20	2.80	3.20	2.80
Statesville	3.50	3.20	3.60	3.20
Stem	2.95	2.83	3.80	2.83
Tarboro	2.30	2.40	3.00	2.40
Waco	2.90	3.60	3.40	3.60
Wadesboro	2.30	3.00	2.50	3.00
Walnut Cove	3.00	3.00	3.40	3.00
Warrenton	3.05	3.25	4.10	3.25
Warsaw	1.50	3.00	3.20	3.00
Washington	2.65	1.75	2.25	1.50
Weldon	2.95	1.90	3.85	1.90
Wilson	2.00	2.60	3.20	2.60
Winston-Salem	3.00	3.00	3.40	3.00

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.										
	Brand claiming				**8 00**			**.82**	**1.00**	**3 00**	**$ 14 60**
7751	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Guano	Waynesville	R	8.75	.40	1.26	1.66	2.02	**2.97**	16 08
	Brands claiming				**8 00**			**1 65**	**2 00**	**2.00**	**15 82**
7796	Acme Mfg. Co., Wilmington, N. C.	Gem Fertilizer	Maiden	R	8.75	1.35	.50	1.86	2 26	**1.87**	16 66
7742	American Fertilizer Co., Norfolk, Va.	Bone and Peruvian Guano	Monroe	R	9 70	1.08	.62	1.70	2.07	**1 76**	16 67
7778	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Asheville	R	8.29	66	1.28	1.94	2.36	2.29	17 54
7693	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Bone and Potash Compound.	Winston	S	8.10	.80	1 10	1 90	2 31	2.15	17 06
7767	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Eli Ammoniated Fertilizer	Warrenton	R	9.00	1.08	.70	1.78	2.16	2.12	17.37
7649	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Roxboro	S	8 27	.92	.82	1 74	2 11	**1 99**	16.42
7713	Farmers Guano Co., Raleigh, N. C.	State Standard Guano	Catawba	R	**6 67**	.94	.84	1.78	2.16	**1 91**	**15 04**
7810	Hampton Guano Co., Norfolk, Va.	Shirley Superphosphate	Maiden	S	8.30	1.18	.68	1.86	2.26	2 02	16.95
7761	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone	High Point	R	8.26	1.26	.60	1 86	2.26	2 23	17 14
7798	Navassa Fertilizer Co., Wilmington, N. C.	Navassa Grain Fertilizer	Maiden	R	8 42	.58	1 08	**1 60**	1 94	**1 90**	15 91
7687	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Statesville	R	8.51	.84	.84	1 68	2 04	2.22	16 65
7795	Pearsall & Co., Wilmington, N. C.	Eagle Guano	Whiteville	S	9 17	.50	1 12	**1 62**	**1 97**	2.26	17.06
7719	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Troutman	S	8.05	1.22	.58	1.80	2.19	**1 98**	16.44
7676	Powhatan Chemical Co., Norfolk, Va.	Magic Tobacco Grower	Mount Airy	R	8.80	.40	.64	**1.04**	**1 26**	2.70	**14 95**

7808	Raisin-Monumental Co., Baltimore, Md.	Raisin's Empire Guano	Conover	R	8.40	.66	.84	**1.50**	**1.82**	**1.91**	**15.51**
7664	Reidsville Fertillzer Co., Reidsville, N. C.	Banner Fertilizer	Pomona	R	**7.91**	.46	1.20	1.66	2.02	2.01	**15.80**
7634	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	North Wilkesboro	S	9.49	.94	.40	**1.34**	**1.63**	**1.82**	**15.77**
7690	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer	Statesville	R	8.26	.38	1.22	**1.80**	**1.94**	**1.98**	15.85
7633	----do	Royster's Special Wheat Fertilizer.	Rockford	R	**7.97**	1.06	.56	**1.62**	**1.97**	**1.94**	**15.62**
7691	Swift's Fertilizer Works, Atlanta, Ga.	Swift's Red Steer Standard Grade Guano.	Winston	S	8.60	.84	.86	1.70	2.07	2.02	**16.59**
7821	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Standard	Statesville	R	**7.85**	.66	.94	**1.60**	**1.94**	2.26	**15.79**
7692	Union Guano Co., Norfolk, Va.	Fish Brand Ammoniated Guano	Winston	R	8.69	.90	.92	1.82	2.21	2.01	17.13
7653	----do	Old Honesty Guano	Elkin	S	10.04	1.04	.84	1.88	2.29	**1.82**	18.37
7779	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Asheville	R	**7.92**	1.10	.98	2.08	2.53	**1.30**	16.67
7739	----do	Allison & Addison's Old Hickory Guano.	Benson	S	8.04	.54	1.10	**1.64**	1.99	2.56	16.45
7762	----do	Ajax Guano	Oxford	D	9.04	.96	.54	**1.50**	**1.82**	**1.90**	16.08
7790	----do	Davie & Whittle's Owl Brand Guano.	Charlotte	R	8.12	.88	.96	1.84	2.24	3.01	17.79
7665	----do	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Greensboro	R	8.32	.28	.98	**1.26**	**1.53**	2.25	**14.88**
7706	----do	Farmers' Favorite Fertilizer	Vineland	R	8.42	.42	1.34	1.76	2.14	2.26	16.93
7731	----do	Southern Chemical Co.'s Electric Tobacco Guano.	Kernersville	S	8.28	1.02	.60	**1.62**	**1.97**	2.06	16.14
7722	----do	Tinsley & Co.'s Stonewall Guano	Claremont	R	8.82	.88	.54	**1.42**	**1.73**	**1.65**	**15.29**
7647	----do	V.-C. C. Co.'s Plant Food	Roxboro	R	8.53	.76	1.06	1.82	2.21	2.03	17.00
7800	----do	Va. State Fertilizer Co.'s Guano	Kings Mountain	R	9.24	.86	.64	**1.50**	**1.82**	1.71	16.05
	Brand claiming				**8.50**			**1.65**	**2.00**	**2.00**	**16.29**
7736	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Superphosphate	Dunn	S	9.16	.78	.90	1.68	2.04	2.72	17.79
	Brand claiming				**8.00**			**1.65**	**2.00**	**3.00**	**16.94**
7792	Armour Fertilizer Works, Wilmington, N. C.	Armour's Carolina Cotton Special Fertilizer.	Wilmington	R	7.84	.56	1.02	**1.58**	**1.92**	**2.60**	**16.08**
	Brands claiming				**8.00**			**2.06**	**2.50**	**3.00**	**18.53**
7828	Acme Mfg. Co., Wilmington, N. C.	Tip Top Crop Grower	Mount Olive	D	8.10	1.44	.86	2.30	2.80	3.11	19.68
7645	Royster, F. S., Guano Co., Norfolk, Va.	Orinoco Tobacco Guano	Durham	R	8.09	.96	1.38	2.34	2.84	**2.76**	19.44

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
					MIXED FERTILIZERS.						
	Brands claiming				**8 00**			**2 06**	**2 50**	**3 00**	**$ 18 53**
7823	Va.-Car. Chemical Co., Richmond, Va.	Durham Fert. Co.'s N. C. Official Farmers' Alliance Guano.	Magnolia	R	8 09	1 08	1 10	2 18	2 65	3 03	19 11
7824	....do	Virginia State Fertilizer Co.'s Buffalo Guano.	Mount Olive	S.	8 77	1 46	.88	2 34	2 84	3 25	20 59
	Brands claiming				**8 00**			**2 47**	**3 00**	**3 00**	**20 13**
7701	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer.	Wilmington	R	8.17	1.48	.90	**2 38**	2.89	**2 72**	**19.62**
7789	....do	Armour's Tobacco Special Fertilizer.	Charlotte	R	8.80	1.48	1.30	2.78	3.38	3 02	22.08
7735	Baugh & Sons Co., Norfolk, Va.	Baugh's H. G. Tobacco Guano	Lumberton	R	**7.77**	1.38	1.10	2.48	3 02	3 12	**20.10**
7797	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Horne's Best	Gastonia	R	8.52	.92	1.68	2.60	3 16	3 67	21.84
7799	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Guano	Maiden	R	8.37	1.58	1.06	2 64	3 21	3.22	21.37
7807	Patapsco Guano Co., Baltimore, Md.	Choctaw Guano	Hickory	R	8.38	1 68	2 60	**2 28**	**2 77**	3 43	20 21
7741	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters Soluble Guano	Wadesboro	R	8.54	.53	2 20	2 73	3 32	3.27	21.93
7809	Union Guano Co., Winston, N. C.	Union Guano Co.'s Union Homestead Guano.	Newton	R	8.09	1.30	1.00	**2 30**	**2 80**	**2.67**	**19 19**
7791	Va.-Car. Chemical Co., Richmond, Va.	Powers, Gibbs & Co.'s Old Kentucky High Grade Tobacco Manure.	Charlotte	R	8.59	1.52	.80	**2 32**	2 82	3 85	21 01
	Brands claiming				**8 00**			**2 47**	**3.00**	**5.00**	**22.33**
7793	Navassa Guano Co., Wilmington, N. C.	Navassa Blood and Meal Mixture.	Wilmington	R	8.90	1.02	1.14	**2.16**	**2 83**	5 23	**22.19**

7688	Patapsco Guano Co., Baltimore, Md.	Patapsco Plant Food for Tobacco and Truck.	Statesville	S	8.34	1.88	.84	2.72	3.31	4 80	23.39
	Brands claiming				**8.00**			**3 29**	**4 00**	**4 00**	**24.47**
7827	Navassa Guano Co., Wilmington, N. C.	Navassa Special Guano	Magnolia	R	**7.97**	1.70	1.40	**3 10**	3 77	5.16	24.94
7826	Pearsall & Co., Wilmington, N. C.	Pearsall's Fish and Potash Compound, High Grade.	Mount Olive	R	8.61	2.12	.74	**2 86**	**3 48**	4.78	**24 16**
7737	Swift's Fertilizer Works, Atlanta, Ga.	Swift's High Grade Monarch Vegetable Grower.	Chadbourn	R	8.31	.88	2.28	**3 18**	**3 84**	**3.67**	**23 84**
	Brand claiming				**9.00**			**.82**	**1.00**	**2.00**	**13.50**
7644	Ober, G., & Sons Co., Baltimore, Md.	Ober's Farmers' Mixture	Hillsboro	R	10.00	.62	.54	1.16	1.41	**1.96**	15.68
	Brands claiming				**9 00**			**82**	**1.00**	**3.00**	**14 60**
7662	Patapsco Guano Co., Baltimore, Md.	Coon Brand Guano	Pilot Mountain	R	9.10	.72	.46	1.18	1.43	**2 88**	15.96
7749	Va.-Car. Chemical Co., Richmond, Va.	Bigelow's Crop Guano	Lincolnton	R	9.40	.48	.36	.84	1.02	**2 31**	14.28
7740	----do----	McCormick's Wheat and Grain Guano.	Charlotte	S	9.25	.36	.58	.94	1.14	3.37	15.70
	Brand claiming				**9 00**			**1 85**	**2 01**	**1 00**	**15 64**
7648	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano.	Durham	R	9.28	.56	1.16	1.72	2 09	1 01	16.17
	Brand claiming				**9 00**			**1 65**	**2 01**	**2 00**	**16 74**
7730	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Standard Guano.	Huntersville	R	9 69	.90	.64	**1.54**	**1 87**	**1 87**	16 78
	Brand claiming				**9 00**			**1 85**	**2 25**	**1 00**	**16 41**
7822	Bradley Fertilizer Co., Boston, Mass.	Standard Sea Fowl Guano	Charlotte	R	10 65	1.44	62	2 06	2 50	1 55	19 32
	Brand claiming				**9.00**			**2 47**	**3 00**	**2 00**	**19 93**
7747	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s L. & M. Special.	Lincolnton	S	9.50	1.20	1 04	**2 24**	**2 72**	**1 75**	**19 21**
	Brand claiming				**9 00**			**2 47**	**3 00**	**4 00**	**22 13**
7750	Va.-Car. Chemical Co., Richmond, Va.	Great Texas Cotton Grower	Lincolnton	S	9.70	1.42	1.34	2 76	3.36	**2 85**	22 63
	Brand claiming				**9 00**			**2 47**	**3 00**	**6 00**	**24 33**
7663	Reidsville Fertilizer Co., Reidsville, N. C.	Lion Brand Fertilizer	Reidsville	R	9.55	.70	2.00	2 70	3 28	**5 65**	25 38

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
					MIXED FERTILIZERS.						
	Brand claiming				**9 00**			**2 88**	**3 50**	**9 00**	**$ 29 23**
7700	American Fertilizer Co., Norfolk, Va.	American Fertilizer Co.'s Strawberry and Asparagus Guano.	Burgaw	B	9.00	2 80	22	3 02	3 67	9 22	30 11
	Brand claiming				**9 25**			**2 06**	**2 50**	**2 00**	**18 56**
7718	Patapsco Guano Co., Baltimore, Md.	Patapsco Guano	Mooresville	R	9.80	1 76	.44	2 20	2.67	2.21	19.83
	Brand claiming				**10.00**			**82**	**1 00**	**3 00**	**15 50**
7748	Chickamauga Fertilizer Works, Chattanooga, Tenn.	Chickamauga Corn Special	Hendersonville	R	**9.61**			.98	1 19	3.56	16.39
	Brand claiming				**2.00**			**3 29**	**2 78**	**6 00**	**21 23**
7661	Germofert Mfg. Co., Charleston, S. C.	Germofert Nature's Plant Food		D	5.75	2 00	1 32	**2 32**	4 04	**5 10**	23 73
	Brand claiming				**13 00**			**2 06**	**2 50**		**16 52**
7694	Baugh & Sons Co., Norfolk, Va.	Baugh's Pure Dissolved Animal Bone.	Winston	R	13.92			2.28	2.77		17.95
	Brands claiming				**8 00**					**4 00**	**11.60**
7788	American Fertilizer Co., Norfolk, Va.	American Special Potash Mixture for Wheat.	Charlotte	S	9 07					**3 02**	11.48
7772	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special Bone and Potash.	Asheville	R	10.14					**3.16**	12 60
7673	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture.	Mount Airy	R	8.11					**3 35**	**10 98**
7685	Pocahontas Guano Co., Lynchburg, Va.	Cherokee Grain Special	Mount Airy	R	8.95					**3.50**	11.90
7726	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Defiance Bone and Potash.	Kernersville	R	8.87					**3.83**	12.19
7675	Powhatan Chemical Co., Richmond, Va.	Magic Grain and Grass Grower	Mount Airy	R	9.49					**3.26**	12 13

7680	Richmond Guano Co., Richmond, Va.	Winter Grain and Grass Grower	Mount Airy	S	9.29					2 78	11 42
7695	Swift Fertilizer Works, Atlanta, Ga.	Swift's Plantation Standard Grade Phosphate and Potash	Winston	R	7.78					4 22	11 64
7640	Union Guano Co., Winston, N. C.	Union Wheat Mixture	North Wilkesboro	R	8.95					3 38	11 77
7655	Va.-Car. Chemical Co., Richmond, Va.	Click's Special for Wheat	Elkin	R	8.80					3 17	11 40
7666	----do	----do	Walnut Cove	R	8 79					3 95	12 25
7656	----do	Durham Fertilizer Co.'s Carr's Special Wheat Grower.	Walnut Cove	S	9 75					3 50	12 62
7776	----do	----do	Asheville	R	8.50					3 27	11 25
7641	----do	Old Dominion Guano Co.'s Miller's Sp'l Wheat Mixture.	Elkin	R	8.36					3 88	11.79
7745	----do	Travers & Co.'s Special Wheat Compound.	Biltmore	R	8.88					3 20	11.51
	Brand claiming				9.00					4.00	12.50
7773	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Bone and Potash Fertilizer.	Morganton	R	9.17					3 85	12 49
	Brand claiming				10 50					1.50	11 02
7765	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Great Wheat and Corn Grower.	Oxford	D	10.53					1 40	11.02
	Brands claiming				10 00					2 00	11 20
7734	Acme Mfg. Co., Wilmington, N. C.	Acme Bone and Potash	Maxton	R	10.77					3.63	13 69
7712	American Fertilizer Co., Norfolk, Va.	Dissolved Bone and Potash for Wheat and Corn.	Catawba	R	10.57					1.74	11.43
7771	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Buncombe Wheat Grower.	Asheville	R	10.04					1.55	10 74
7812	Hampton Guano Co., Norfolk, Va.	Dauntless Potash Mixture	Maiden	R	10.30					1 96	11 43
7774	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Wheat Fertilizer	Morganton	R	9.14					2 45	10 92
7794	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.	Maiden	R	10.67					1 80	11.36
7817	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters Bone and Potash	Statesville	R	10.92					2.03	12.06
7679	Pocahontas Guano Co., Richmond, Va.	Carrington's Superior Grain Compound.	Mount Airy	R	10.31					2.00	11 48
7632	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture	Ronda	R	10.01					2 02	11 23
7667	Reidsville Fertilizer Co., Reidsville, N. C.	Bone and Potash	Pomona	R	10.50					3 55	13 35
7638	Richmond Guano Co., Richmond, Va.	Bone and Potash Mixture	North Wilkesboro	R	10.23					1 82	11 21
7696	Swift Fertilizer Works, Atlanta, Ga.	Swift's Field and Farm Standard Grade Phos. and Potash.	Winston	R	9 48					2 45	11 23

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
					MIXED FERTILIZERS.						
	Brands claiming				**10 00**					**2 00**	**$ 11 20**
7818	Swift Fertilizer Works, Atlanta, Ga.	Swift's Standard Grade Wheat Grower.	Fayetteville	D	10 79					1 56	11.43
7727	Union Guano Co., Winston, N. C.	Union 10-2 Bone and Potash	Lexington	R	**9 23**					2 32	**10 86**
7652	do	Union Bone and Potash	Elkin	S	**9 93**					**1 58**	**10 87**
7683	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's McGavock's Special Potash Mixture.	Mount Airy	R	**9 89**					**1 55**	**10 42**
7721	do	do	Catawba	R	10.10					**1 69**	**10 95**
7755	do	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Salisbury	R	11.39					**1 50**	11 90
7651	do	Durham Fertilizer Co.'s Durham Bone and Potash Mixture.	Durham	R	10.93					**1 82**	11 84
7744	do	Durham Fertilizer Co.'s Standard Wheat Grower.	Biltmore	R	11 15					**1 33**	11 50
7657	do	Old Dominion Alkaline Bone and Potash.	Crutchfield	S	10 59					**1 68**	11.38
7658	do	Southern Chem. Co.'s Mammoth Wheat and Grass Grower.	Crutchfield	R	10.06					**1 69**	**10 91**
7654	do	Travers & Co.'s Bone and Potash Compound.	Elkin	S	11.92					**1 35**	12 21
7725	do	Travers & Co.'s Capital Bone and Potash Compound.	Rutherfordton	R	**9 85**					3 17	12 17
7793	do	Va. State Fertilizer Co.'s Dissolved Bone and Potash.	Kings Mountain	R	11 65					**1 68**	11 77
	Brands claiming				**10 00**					**4 00**	**13 40**
7795	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special Bone and Potash Mixture.	Gastonia	R	12.27					**3 33**	14.70

7723	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture.	Waynesville	R	10.90				5.03	15 34
7760	Miller Fertilizer Co., Baltimore, Md.	Miller Fertilizer Co.'s 10-4 Mixture.	High Point	R	10 42				4 11	13 90
7678	Pocahontas Guano Co., Lynchburg, Va.	Wabash Wheat Mixture	Mount Airy	R	10 14				4 09	13 53
7635	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Bone and Potash Mixture.	Ronda	S	10 56				4 04	13 95
7681	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture	Mount Airy	R	10 48				3 68	13 48
7636	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture.	Rockford	R	10.00				3 98	13 38
7639	Union Guano Co., Winston, N. C.	Quaker Grain Mixture	North Wilkesboro	R	10.45				3 70	13 47
7668	Va.-Car. Chemical Co., Richmond, Va.	Special Potash Mixture	Greensboro	R	10.06				4.01	13 46
7792	----do	Va. State Fertilizer Co.'s XX Potash Mixture.	Kings Mountain	R	10 35				3 73	13 42
	Brand claiming				10 00				6 00	15 60
7746	Asheville Packing Co., Asheville, N. C.	High Grade Special Potash Mixture.	Hendersonville	R	10.98				4 95	15 32
	Brand claiming				11.00				5 00	15 40
7775	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Quickstep Bone and Potash.	Asheville	R	12.02				3 88	14 87
	Brand claiming				12.00				4 00	15 20
7811	Union Guano Co., Winston, N. C.	Union Guano Co.'s Bone and Potash.	Hickory	R	8 95				3 58	11 99

Raw or Unmixed Fertilizer Materials.

	Brands claiming				12 00					9 60
7715	Navassa Guano Co., Wilmington, N. C.	Navassa Acid Phosphate	Catawba	R	12.09					9 67
7729	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Durham Acid Phosphate.	Mocksville	R	12.57					10 06
7756	----do	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Salisbury	R	15 25					12 20
7732	----do	Southern Chemical Co.'s Tar Heel Acid Phosphate.	High Point	R	12.75					10 20
	Brands claiming				13 00					10 40
7785	Acme Manufacturing Co., Wilmington, N. C.	Acme Acid Phosphate	Charlotte	R	13 30					10 64
7671	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Sterling Acid Phosphate.	Walnut Cove	R	14.15					11 32
7650	Columbia Guano Co., Norfolk, Va.	Columbia Dissolved Bone	Hillsboro	S	13.32					10 66

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
					RAW OR UNMIXED FERTILIZER MATERIALS.						
	Brands claiming				**13.00**						**$ 10.40**
7699	Etiwan Fertilizer Co., Charleston, S. C.	Diamond Soluble Bone	Winston	R	14.58						11.66
7714	Farmers Guano Co., Raleigh, N. C.	Farmers Acid Phosphate	Catawba	R	13.22						10.58
7711	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone	Wilmington	R	14.65						11.72
7698	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Winston	S	14.16						11.33
7697	Union Guano Co., Winston, N. C.	Union Dissolved Bone	Winston	R	13.26						10.61
7769	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s I X L Acid Phosphate	Marion	R	13.29						10.63
7724	----do	Davie & Whittle's Owl Brand Acid Phosphate.	Rutherfordton	R	13.34						10 67
7659	----do	Durham Fertilizer Co.'s Double Bone Phosphate.	Crutchfield	R	12 84						10 27
7754	----do	Durham Fertilizer Co.'s Double Bone Phosphate Extra Strong	Salisbury	R	14.49						11.59
7660	----do	Old Dominion Guano Co.'s Acid Phosphate.	Crutchfield	S	13.04						10 43
	Brands claiming				**14.00**						**11.20**
7782	American Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate	Charlotte	R	14 39						11.51
7770	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Standard Phosphoric Acid.	Asheville	S	15.34						12 27
7766	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Climax Dissolved Bone	Warrenton	R	**13.41**						**10.73**
7803	Hampton Guano Co., Norfolk, Va.	Hampton's Acid Phosphate	Maiden	R	14.90						11.92
7801	Navassa Guano Co., Wilmington, N. C.	Navassa 14 Per Cent Acid Phosphate.	Maiden	R	**13.93**						**11.14**

7642	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate	Rhonda	R	14.60						11.68
7684	Powhatan Chemical Co., Richmond, Va.	High Grade Acid Phosphate	Mount Airy	R	**13.44**						**10.75**
7643	Royster, F. S., Guano Co., Norfolk, Va.	14 Per Cent Acid Phosphate	Rockford	R	14.58						11.66
7804	Swift Fertilizer Works, Atlanta, Ga.	Swift's Cultivator High Grade Acid Phosphate.	Maiden	R	**13.63**						**10.90**
7819	Union Guano Co., Winston, N. C.	Union Guano Co.'s High Grade Acid Phosphate.	Statesville	R	14.16						11.33
7672	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Fulton Acid Phosphate.	Greensboro	R	14.97						11.98
7768	do	Davie & Whittle's Owl Brand High Grade Dissolved Bone.	Biltmore	D	14.10						11.28
7816	do	Durham Fertilizer Co.'s Standard Grade Acid Phosphate.	Hickory	R	15.27						12.22
7763	do	Va.-Car. Chemical Co.'s 14 Per Cent Acid Phosphate.	Henderson	D	14.40						11.52
7758	do	Southern Chemical Co.'s Red Cross Acid Phosphate.	Salisbury	R	15.17						12.14
7707	do	J. G. Tinsley & Co.'s Powhatan Acid Phosphate.	Rose Hill	R	14.54						11.63
7753	do	S. W. Travers & Co.'s Dissolved Bone Phosphate.	Hendersonville	R	14.74						11.79
	Brands claiming				**16.00**						**12.80**
7783	American Fertilizer Co., Norfolk, Va.	American High Grade Acid Phosphate.	Charlotte	R	16.04						12.83
7708	Armour Fertilizer Works, Wilmington, N. C.	16 Per Cent Acid Phosphate	Wilmington	R	16.35						13.08
7784	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	16 Per Cent Caraleigh Acid Phosphate.	Gastonia	D	16.22						12.98
7716	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate.	Claremont	D	17.45						13.96
7815	Patapsco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Hickory	R	17.10						13.68
7805	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate	Maiden	R	17.95						14.36
7752	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone Phosphate	Shelby	R	**15.56**						**12.45**
7814	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 16 Per Cent Acid Phosphate.	Conover	S	16.30						13.04
7630	Swift Fertilizer Works, Atlanta, Ga.	High Grade Swift's Special Acid Phosphate.	Winston	R	16.34						13.07
7813	Union Guano Co., Winston, N. C.	Union 16 Per Cent Acid Phosphate.	Newton	D	**15.30**						**12.24**
7781	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand High Grade Acid Phosphate.	Charlotte	D	**15.41**						**12.33**
7780	do	Durham Fertilizer Co.'s Acid Phosphate.	Gastonia	R	16.24						12.99
7743	do	Va.-Car. Chemical Co.'s 16 Per Cent Acid Phosphate.	Monroe	R	16.31						13.05

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1909.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Mechanical Condition.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Ammonia.	Organic Ammonia.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.										
	Brands claiming				16 00						$ 12 00
7682	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.	Mount Airy	R	16.40						13 12
7757	do	do	Salisbury	R	16.35						13.08
7802	do	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.	Kings Mountain	R	16.69						13 35
	Brands claiming									12 00	12 00
7799	Calder Bros., Wilmington, N. C.	Genuine German Kainit	Vineland	R						12 50	12 50
7786	Farmers Cotton Oil Co., Wilson, N. C.	do	Gastonia	P						12.10	12 10
7738	Swift Fertilizer Works, Atlanta, Ga.	Pure German Kainit	Chadbourn	S						12.24	12.24
7764	Va.-Car. Chemical Co., Richmond, Va.	Genuine German Kainit	Oxford	R						11 96	11 96
	Brand claiming									50 00	50 00
7820	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Muriate of Potash	Statesville	P						47 54	47 54
	Brands claiming							14 83	18 00		53 38
7710	Coe-Mortimer Co., Charleston, S. C.	Nitrate of Soda	Wilmington	B				14.96	18.19		53.86
7829	Va.-Car. Chemical Co., Richmond, Va.	do	Mount Olive	P				15.20	18.48		54 72
	Brands claiming							2 47	3 00		24 29
7674	Martin, D. B., Co., Baltimore, Md.	Martin's Pure Ground Bone	Winston	R				3.00	3 65		a24.54
7759	Miller Fertilizer Co., Baltimore, Md.	Ground Bone	High Point	R				2.70	3.28		b24.35

	Brands claiming						**3 70**	**4.50**	29 11
7670	Baugh & Sons Co., Norfolk, Va.	Baugh's Raw Bone Meal	Madison	D			3.96	4 81	c27 38
7677	Pocahontas Guano Co., Richmond, Va.	Raw Bone Meal	Mount Airy	S			**3.66**	**4.45**	d26 53
7720	Royster, F. S., Guano Co., Norfolk, Va.	Pure Raw Bone Meal	Salisbury	S			3.96	4.81	e27 85
7646	Union Guano Co., Winston, N. C.	Pure Bone Meal	Reidsville	B			4.24	5.15	f29 93
7669	Va.-Car. Chemical Co., Richmond, Va.	Pure Raw Bone	Greensboro	R			4 12	5.01	g29 67
	Brand claiming						**2 88**	**3.50**	**3 25**
7631	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	North Wilkesboro	R			**1.89**	**2 30**	**2 72** h23.03
	Brand claiming						**4 13**	**5 02**	**2 00**
7689	Peruvian Guano Corporation, Charleston, S. C.	----do	Winston	R			**3 80**	**4 62**	**1 85** i24 29
	Brand claiming						**1 65**	**2 00**	**2 50** **20 39**
7686	Martin, D. B., Co., Baltimore, Md.	Pure Animal Bone and Potash	Winston	D			1 98	2 41	**2.27** j23 92

N, D, R, S, B, P, Y and W refer to the mechanical condition of fertilizers, as follows: N—fine; D—good; R—fair; S—coarse; B—very coarse; P—damp; Y—lumpy; W—wet.

(a) Total Phosphoric Acid found, 19.63, valued at 3½ cents per pound.
(b) Total Phosphoric Acid found, 20.90, valued at 3½ cents per pound.
(c) Total Phosphoric Acid found, 18.75, valued at 3½ cents per pound.
(d) Total Phosphoric Acid found, 19.08, valued at 3½ cents per pound.
(e) Total Phosphoric Acid found, 19.43, valued at 3½ cents per pound.
(f) Total Phosphoric Acid found, 20.95, valued at 3½ cents per pound.
(g) Total Phosphoric Acid found, 21.20, valued at 3½ cents per pound.
(h) Total Phosphoric Acid found, 18.10, valued at 3½ cents per pound.
(i) Total Phosphoric Acid found, 10.63, valued at 3½ cents per pound.
(j) Total Phosphoric Acid found, 19.58, valued at 3½ cents per pound.

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brand claiming			**8 00**			**.62**	**1 00**	**3 00**				**$13 70**
8207	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Fertilizer	Lexington	8 08	.22	.78	1.00	1.22	**2 97**				14.44
	Brands claiming			**8 00**			**.82**	1.00	**4 00**				**14 80**
8433	Ober, G., & Sons Co., Baltimore, Md.	Ober's Stag Guano	Henderson	9 10	.34	.50	.84		**3 96**				15.82
8572	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Favorite	Siloam	**7 99**	.48	.50	.98	1.19	4.84				16 33
8128	Swift Fertilizer Works, Atlanta, Ga.	Swift's Special Peanut Standard Grade Guano.	Williamston	**7.83**	.56	.66	1 22	1.48	**3 89**				18.08
8471	Union Guano Co., Winston, N. C.	Union Superlative Guano	Garner	8 42	.50	.34	.84	1.02	7 06				18 62
	Brand claiming			**8 00**			**1.00**	**1 22**	**3 00**				**14.40**
8514	Pocahontas Guano Co., Lynchburg, Va.	Complete Champion Brand	Semora	8.62	.70	.50	1 20	1 46	3 40				16.18
	Brands claiming			**8 00**			**1 00**	**1 22**	**4 00**				**15.50**
8533	Hampton Guano Co., Norfolk, Va.	Hampton's Special Grain and Peanut Fertilizer.	Ahoskie	8.12	.82	.28	1 10	1 34	4 35				16.38
7874	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Wheat, Corn and Peanut Manure.	Edenton	8.22	.86	.34	1 20	1.46	4 04				16 52
8126	Union Abattoir Co., Norfolk, Va.	Red Star Brand	Williamston	8 37	.96	.38	1.34	1 63	4.27				17.45
8109	Va.-Car. Chemical Co., Richmond, Va.	Peanut Grower	Edenton	8.07	.38	.68	1.06	1.29	5.00				16.90
	Brands claiming			**8.00**			**1.03**	**1.25**	**4 00**				**15.82**
8535	Martin, D. B., Co., Richmond, Va.	Martin's Peanut Grower	Edenton	**7.77**	.74	.44	1.18	1.43	**3.87**				15.85
8331	Royster, F. S., Guano Co., Norfolk, Va.	Jumbo Peanut Grower	Edenton	8.30	.74	.46	1.20	1.46	**3 99**				16 54

	Brands claiming												
				8 00			1.85	2 00	2.00				15 82
8188	Acme Mfg. Co., Wilmington, N. C.	Gem Fertilizer	Fayetteville	8.29	.92	1.00	1.92	2 33	2 25				17.42
7999	American Fertilizer Co., Norfolk, Va.	Bone and Peruvian Guano	Elizabeth City	7 09	.64	1.26	1.90	2 31	2 47				16 51
8508	----do	Hannah's Special Formula Guano.	Ruffin	9 24	.96	.60	1 56	1.89	1 99				16 59
8074	American Chemical Fertilizer Works, New York, N. Y.	Dawson's Crop Maker	Williamston	8 17	1.08	.62	1.70	2 07	1 99				16 17
8089	Armour's Fertilizer Works, Wilmington, N. C.	Armour's General Fertilizer	Dunn	8 07	1.20	.52	1.72	2 09	2 03				16 20
8569	----do	Armour's Slaughterhouse Fertilizer.	Godwin	8 60	1 40	.56	1.96	2 38	2.35				17 97
8107	Arps, G. L., & Co., Norfolk, Va.	Arps' Premium Guano for Cotton, Tobacco, etc.	Edenton	8.10	1.26	.46	1 72	2 09	1 95	1.95		6 32	16 14
8527	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Waynesville	7 88	1.64	.88	2.52	3 06	1 70				18 79
8260	Atlantic Chemical Co., Norfolk, Va.	Atlantic Soluble Guano	Mount Gilead	7 87	1.30	46	1 76	2 14	2.08				16 23
8446	Bailey, Jno. L., & Co., Elm City, N. C.	Bailey's Buck Brand Guano	Elm City	7 70	.66	1.20	1.86	2 26	2 48				16 91
8039	Baugh & Sons Co., Norfolk, Va.	Baugh's Compound for All Crops.	Wilmington	9.02	.76	1 04	1.80	2 19	2 55				17.94
7930	----do	Baugh's Fish Mixture	Elizabeth City	7.85	1.02	.80	1 82	2 21	2 18				16.56
8100	Berkley Chemical Co., Norfolk, Va.	Brandon Superphosphate	Four Oaks	8.68	1.26	.52	1.78	2.16	1 95				16 90
8510	Blackstone Guano Co., Blackstone, Va.	Red Letter for Tobacco	Roxboro	10.51	.68	.40	1 08	1 31	1 41	1.41		3 92	15 22
7964	Bragaw Fertilizer Co., Washington, N. C.	Old Reliable Premium Guano	Washington	8.73	.36	1.42	1.78	2.16	2.63				17 69
8181	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Butcher Bone	Everetts	8 75	1.62	.58	2 20	2 67	2 83				19 57
8600	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Eli Ammoniated Fertilizer	Lexington	8.36	1 26	.44	1.70	2.07	2 22				16.60
8043	Clayton Oil Mill, Clayton, N. C.	Summer Queen	Princeton	8.83	.68	1 06	1.74	2 11	2 60				17 60
7917	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Lumberton	8.52	.80	1.14	1.94	2.36	2.05				17.49
8431	----do	Columbia Special Tobacco Guano.	Hillsboro	7.99	1.68	.60	2.28	2 77	2.39	2 39		7 15	18 71
7880	Cowell, Swann & McCotter Co., Bayboro, N. C.	Bone and Fish Guano	Washington	8 66	.38	1.32	1.70	2.07	2 61				17 29
8368	Craven Chemical Co., New Bern, N. C.	Elite Cotton Grower	Pollocksville	8.55	.72	.94	1.66	2 02	1 16				15 44
8087	Dunn Oil Mill Co., Dunn, N. C.	Sampson Cotton Grower	Dunn	7.36	.36	1.64	2 00	2 43	3 02				17 74
7866	Eastern Cotton Oil Co., Hertford, N. C.	Perquimans Favorite	Hertford	8.18	.46	1.49	1.86	2.26	3.83				18 83
8011	Farmers Cotton Oil Co., Wilson, N. C.	Farmers' Special Guano	Wilson	7.53	.54	1.30	1.84	2.24	2.70				16.92

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.									
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
				MIXED FERTILIZERS.									
	Brands claiming			**8.00**			**1.65**	**2.00**	**2 00**				**$15 82**
7967	Farmers Guano Co., Raleigh, N. C.	State Standard Guano	Raleigh	8 47	.66	.98	**1 64**	1 99	2.16				16 39
8094	Fremont Oil Mill Co., Fremont, N. C.	Up-to-date	Lucama	8.05	1 02	.72	1 74	2 11	2.38				16 65
7943	Goldsboro Oil Mill, Goldsboro, N. C.	Goldsboro Oil Mill Standard	Goldsboro	8 48	.42	1 28	1 70	2 07	2.28				16.77
8008	Hadley, Harris & Co., Wilson, N. C.	Daisy Fish Mixture	Wilson	**7 89**	1 18	.48	1 66	2 02	2.00				**15 77**
7951	Hampton Guano Co., Norfolk, Va.	Shirley Superphosphate	Ayden	8 65	.72	1.08	1.80	2 19	**1.92**				16 92
8547	----do	----do	Clinton	8.72	1.22	.56	1.78	2.16	2.21				17.22
7833	Harrell, S. B., & Co., Norfolk, Va.	Harrell's Champion Cotton and Peanut Grower.	Edenton	8 14	1.20	60	1.80	2.19	**1.99**				16 53
8238	Imperial Co., Norfolk, Va.	Champion Guano	Pinetop	8.10	1 16	.60	1.76	2 14	2 08				16.44
8244	Lister's Agricultural Chemical Co., Newark, N. J.	Lister's Success Fertilizer	Mooresville	8 54	1 02	.80	1.82	2.21	2.32				17.34
8324	MacMurphy Co., Charleston, S. C.	Special Cotton and Corn Guano	Wadesboro	8 20	40	1 60	2.00	2 43	2.58				18.02
7910	Martin, D. B., & Co., Baltimore, Md.	Martin's Carolina Cotton Fertilizer.	Lumberton	8 44	1 24	.58	1.82	2 21	**1 92**				16 81
8332	Martin & White, Baltimore, Md.	Big Crop Grower	Hertford	9 63	1 22	.18	**1 40**	**1 70**	2 43				16.80
7901	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Cotton Guano	New Bern	8.34	.76	1.04	1 80	2.19	2.48				17.25
7984	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone	Oxford	8.56	.98	.76	1.74	2.11	2.41				17.14
8283	Navassa Guano Co., Wilmington, N. C.	Navassa Cotton Fertilizer	Richland	10.10	.84	1 18	2 02	2 46	2.83				20 08
8550	----do	Navassa C. S. M. Guano	Rose Hill	**7 90**	.30	1.28	**1.58**	1.92	2.72				16.26

8315	North Carolina Cotton Oil Co., Charlotte, N. C.	Majestic Fertilizer	Charlotte	8 06	.68	.76	**1 44**	1.75	2.23				**15 32**
7983	North Carolina Cotton Oil Co., Henderson, N. C.	Henderson Cotton Grower	Oxford	8 09	48	1.24	1 72	2.09	**1 87**				16 04
8031	North Carolina Cotton Oil Co., Wilmington, N. C.	Wilmington Cotton Grower	Wilmington	8 49	.78	.86	**1.64**	1.99	**1 95**				16 18
7905	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Craven Cotton Guano	New Bern	8.30	.32	1 64	1.96	2.38	2 41				17 76
8539	Ober, G., & Sons Co., Baltimore, Md.	Ober's Special Cotton Compound.	Edenton	8 74	.78	1.06	1 84	2 24	2 85				18 18
7878	Pamlico Chemical Co., Norfolk, Va.	Pamlico Superphosphate	Edenton	8.05	1.22	.64	1 86	2 26	2 05				16 75
8077	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Concord	8 66	.94	.86	1 80	2 19	2.02				17 04
8274	Pearsall Co., Wilmington, N. C.	Eagle Guano	Burgaw	8.84	.90	.90	1 80	2 19	2 79				18 04
8051	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Red Leaf Tobacco Guano.	Greensboro	8.59	.72	.96	1 68	2.04	**1 95**	1 95		5.60	16.43
7996	----do	Piedmont Special for Cotton, Corn and Peanuts.	Elizabeth City	8 70	.66	.88	**1.54**	1 87	2 27				16 33
8284	Pine Level Oil Mill Co., Pine Level, N. C.	Cotton Grower Fertilizer for All Crops.	La Grange	8.98	26	1 38	**1 64**	1.99	3 01				17 79
8360	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Standard Fertilizer	Swann	10 04	1.00	.72	1 72	2 09	**1 94**				17 88
8447	Pocahontas Guano Co., Lynchburg, Va.	Carrington's Banner Brand Guano.	Battleboro	8.11	1.15	.65	1.80	2 19	2 18				16 72
7875	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Edenton	8 05	1 22	.64	1.86	2 26	2 05				16.75
8367	Powhatan Chemical Co., Richmond, Va.	Magic Cotton Grower	Kinston	**7.74**	1.48	.78	2 26	2.75	2 02				18 00
8176	----do	Magic Tobacco Grower	Henderson	10.57	1 64	.62	2.26	2 75	2 28	1 36	92	1 03	20 83
7955	Raisin-Monumental Co., Baltimore, Md.	Raisin's Empire Guano	Raleigh	8.69	.86	1 04	1.90	2 31	**1 89**				17 31
8459	Reidsville Fertilizer Co., Reidsville, N. C.	Champion Guano	Reidsville	8 72	.74	1 30	2.04	2.48	2.45				18.50
8091	Richmond Guano Co., Richmond, Va.	Premium Brand Guano	Creedmoor	9 34	1 50	.56	2 16	2 63	2.47				19 55
8482	Robertson Fertilizer Co., Norfolk, Va.	Double Roller Soluble Guano	Taylorsville	8 60	1 08	.76	1 84	2.24	2 55				17 72
7861	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer	Greenville	**7 95**	.84	.90	1.74	2.11	2 00				16 14
8423	Southern Cotton Oil Co., Concord, N. C.	Gloria Standard Fertilizer	Albemarle	8.30	.72	.86	**1 58**	1 92	2 06				15 90
8190	Southern Cotton Oil Co., Fayetteville, N. C.	Fayetteville Oil Mill Standard	Fayetteville	8.43	.40	1 36	1 76	2.14	2.53				17 23
8586	Southern Cotton Oil Co., Gibson, N. C.	Gloria Standard Fertilizer	Lumberton	**7 87**	.74	1.32	2 06	2.50	2 60				17 98
8040	Southern Cotton Oil Co., Wilson, N. C.	Wilson's Oil Mill Standard	Wilson	8 25	20	1.50	1.70	2.07	2.62				16 84
7915	Southern Exchange Co., Maxton, N. C.	Coon Guano	Lumberton	9 01	1 31	58	1 89	2 30	2 19				17 89
8019	Swift Fertilizer Works, Atlanta, Ga.	Swift's Red Steer	Washington	8 00	1 04	80	1 84	2 24	2 79				17 44

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brands claiming			**8.00**			**1.65**	**2.00**	**2.00**				**$15.82**
7947	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Fertilizer	Ayden	8.24	1.26	.70	1.96	2.38	2.02				17.28
8489	Union Abattoir Co., Norfolk, Va.	Union Abattoir Standard Fertilizer.	South Mills	8.79	.86	.80	1.66	2.02	2.46				17.09
8157	Union Guano Co., Winston, N. C.	Fish Brand Ammoniated Guano	Wallace	8.07	.85	1.20	2.05	2.49	2.85				18.39
8209	----do	Old Honesty Guano	Statesville	9.35	1.04	.66	1.70	2.07	**1.73**				16.95
7966	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Anchor Brand Fertilizer.	Raleigh	9.69	.82	.76	1.58	1.92	1.80				16.86
8052	----do	----do	Winston	8.58	.94	.74	1.68	2.04	2.09				16.57
8560	----do	Atlantic and Va. Fertilizer Co.'s Eureka Ammoniated Bone.	Norwood	**7.70**	1.34	.38	1.72	2.09	2.15				16.00
8326	----do	Charlotte Oil and Fert. Co.'s King Cotton Grower.	Rocky Mount	9.17	.84	.90	1.74	2.11	2.08				17.33
8593	----do	Diamond Dust	Dunn	8.22	.36	1.40	1.76	2.14	2.53				17.01
7881	----do	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Washington	8.00	.94	.68	**1.62**	1.97	**1.95**				**15.66**
8515	----do	Durham Fertilizer Co.'s Progressive Farmer Guano.	Semora	**6.79**	.80	.94	1.74	2.11	2.12				**15.23**
7884	----do	Genuine Slaughterhouse Bone	Washington	8.04	.92	.70	**1.62**	1.97	1.94				**15.69**
7961	----do	----do	Washington	8.00	.58	1.22	1.80	2.19	2.00				16.42
7882	----do	Old Dominion Soluble Guano	Washington	8.01	.94	.70	**1.64**	1.99	2.00				**15.60**
8053	----do	Old Dominion Soluble Tobacco Guano.	Winston	9.13	.50	1.16	1.66	2.02	**1.93**	1.93		1.97	16.81
8076	----do	Owl Brand Guano	Williamston	9.33	.36	1.00	**1.36**	1.65	2.12				16.03

8295	----do----	Powers, Gibbs & Co.'s Soluble Ammoniated Guano.	Robersonville	8.67	.34	1.32	1.66	2.02	2.03			16.51
7883	----do----	Stonewall Guano	Washington	8.07	.84	.70	**1.54**	1.87	**1 87**			**15 32**
8366	----do----	Tinsley & Co.'s Lee Brand Guano.	Maysville	9.25	.94	.68	**1 62**	1.97	**1.85**			16.68
8473	----do----	Tinsley & Co.'s Stonewall Guano.	Lucama	9.53	1 14	.42	**1 56**	1.89	**1 72**			16.55
7994	----do----	Travers & Co.'s Beef, Blood and Bone.	Elizabeth City	**7.46**	.62	1 02	**1 64**	1.99	2 68			16.09
7980	----do----	Travers & Co.'s National Fertilizer.	Durham	8.28	.80	1.10	1.90	2.31	**1 70**			16.73
7895	----do----	Wilson Standard	Farmville	**7 97**	.52	1 24	1.76	2.14	2 06			17.20
7836	Winborne Guano Co., Norfolk, Va.	Winborne's Excelsior Guano	Edenton	**7.99**	1.06	.80	1.86	2.26	2.34			17.46
8018	Young, J. R., Fertilizer Co., Norfolk, Va.	Young's New Process Guano for Cotton, Corn and Peanuts.	Washington	7.71	.80	.88	1.68	2.04	2.15			15.85
	Brands claiming			**8 00**			**1 65**	**2 00**	**3.00**			**16.92**
8442	Armour Fertilizer Works, Wilmington, N. C.	Armour's Carolina Cotton Special.	Garland	9.13	.84	.58	**1.42**	1 73	**2 55**			**16 58**
8150	Floradora Guano Co., Laurinburg, N. C.	Red Raven	Laurinburg	9.26	.24	1.36	**1.60**	1.94	3.75			18.70
8415	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Fish Compound	Washington	**7.66**	.84	.94	1.78	2.16	3.35			17.52
8548	Navassa Guano Co., Wilmington, N. C.	Harvest King Guano	Rock Hill	**7.77**	.76	1.04	1.80	2.19	3.14			17.47
8239	North Carolina Cotton Oil Co., Wilmington, N. C.	Wilmington Banner	Pinetop	8.32	.82	.78	**1.60**	1.94	3.18			17.23
8551	Pocomoke Guano Co., Norfolk, Va.	Crescent Complete Compound	Rose Hill	8.79	1.06	.58	**1.64**	1.99	**2 99**			17.59
	Brand claiming			**8.00**			**1.65**	**2 00**	**3 50**			**17 58**
8240	Royster, F. S., Guano Co., Norfolk, Va.	Corbett & Moore's Special	Macclesfield	**7.99**	.84	.96	1.80	2.19	**3 48**			18.04
	Brand claiming			**8.00**			**1.65**	**2.00**	**4 00**			**18 03**
8333	Miller Fertilizer Co., Baltimore, Md.	Potato and Vegetable Grower	Elizabeth City	8.07	.96	.84	1.80	2.19	4.06			18.75
	Brand claiming			**8 00**			**1 85**	**2 25**	**2.50**			**17 18**
8457	Reidsville Fertilizer Co., Reidsville, N. C.	Broad Leaf Tobacco Guano	Reidsville	8.55	.52	1.58	2.10	2.55	2.98	2.98	4 45	19 16
	Brand claiming			**8 00**			**1 85**	**2.25**	**4 00**			**18 81**
8222	Pocomoke Guano Co., Norfolk, Va.	Monticello Animal Bone Fertilizer.	Washington	9.34	1.40	68	2 08	2.53	**3 98**			20 90
	Brand claiming			**8 00**			**1 65**	**2.00**	**5 00**			**19 14**
7939	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Monarch Brand Guano.	Selma	8.97	.68	1 02	1 70	2.07	**3 38**			**18 42**

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.										
	Brand claiming			**8.00**			**1.65**	**2.00**	**6.00**				**$20 23**
8195	Martin, D. B., Co., Richmond, Va.	Privott's Special for Sweet Potatoes and Peanuts.	Edenton	8.00	1.26	.32	**1.58**	1.92	6.02				**19 98**
	Brand claiming			**8.00**			**1.65**	**2.00**	**10.00**				**24.83**
8378	Va.-Car. Chemical Co., Richmond, Va.	Smith's Irish Potato Guano	Kernersville	8.58	1.02	.70	1.72	2.09	10.44				25.91
	Brands claiming			**8.00**			**2.06**	**2.50**	**2.00**				**17 43**
8501	American Agricultural Chemical Co., New York, N. Y.	Slingluff's British Mixture	Roxboro	8.32	1.36	.78	2.14	2.60	2.81				18.92
8079	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's Ammoniated Dissolved Bone Phosphate.	Concord	**7.90**	1.64	.58	2.22	2.70	2.10				18.08
8028	Navassa Guano Co., Wilmington, N. C.	Navassa Soluble Guano	Wilmington	8.77	1.32	.86	2.18	2.65	2.83				19.51
	Brands claiming			**8.00**			**2.06**	**2.50**	**2.50**				**17 98**
8313	Armour Fertilizer Works, Wilmington, N. C.	Armour's Champion Fertilizer	Fountain	8.67	1.22	.66	**1.88**	2.29	**2.49**				**17 87**
7902	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' All Crop Guano	New Bern	8.61	.78	1.30	2.08	2.53	**2.42**				18.52
8406	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Osceola Tobacco Guano.	Spring Hope	9.35	1.50	.76	2.26	2.75	**2.32**	2.32		2.70	19.78
	Brands claiming			**8.00**			**2.06**	**2.50**	**3.00**				**18 53**
8407	Acme Mfg. Co., Wilmington, N. C.	Tip Top Crop Grower	Roseboro	8.40	1.66	.82	2.48	3.02	3.03				20.56
7885	....do	Tip Top Tobacco Grower	Farmville	8.47	.80	1.24	**2.04**	2.48	3.11	3.11		3.32	19.00
8487	American Fertilizer Co., Norfolk, Va.	American No. 1 Fertilizer	Four Oaks	8.98	.62	1.78	2.40	2.92	3.05				20.80
8429	Armour & Co., Wilmington, N. C.	Armour's Gold Medal for Tobacco.	Mebane	8.84	1.42	.66	2.08	2.53	3.33	2.39	.94	1.80	19.73

8430	Atlantic Chemical Co., Norfolk, Va.	Atlantic Tobacco Grower	Mebane	8.10	1.38	.82	2.20	2.67	3.01	3.01		8.50	19.18
8401	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Special Tobacco Fertilizer.	Spring Hope	8.00	1.24	1.18	2.42	2.94	3.23	3.23		7.87	20.18
8063	....do	Planters' Pride	Edenton	**7.99**	.90	1.32	2.22	2.70	**2.13**				**18.19**
8272	Craven Chemical Co., New Bern, N. C.	Marvel Great Crop Grower	Edenton	**7.80**	1.80	1.14	2.94	3.57	4.04				22.93
8202	Farmers Guano Co., Raleigh, N. C.	Big Crop Guano	Everetts	**7.95**	.80	1.22	**2.02**	2.46	**2.49**				**17.77**
8504	....do	Toco Tobacco Guano	Roxboro	**7.89**	.84	.90	**1.74**	2.11	**2.64**	2.64		6.62	**16.79**
8231	Imperial Co., Norfolk, Va.	Bright Tobacco Guano	Louisburg	9.76	1.41	.74	2.18	2.65	3.09	3.09		4.45	20.68
7900	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Roanoke Guano	New Bern	8.59	.50	1.32	**1.82**	2.21	3.27				19.42
8329	Miller Fertilizer Co., Baltimore, Md.	Harmony	Rocky Mount	8.29	1.50	.72	2.22	2.70	**2.99**				19.41
8167	North Carolina Cotton Oil Co., Wilmington, N. C.	Wilmington Tobacco Grower	Wilmington	8.55	.72	1.22	**1.94**	2.36	3.16	3.16		4.87	18.74
7904	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Jones County Premium Crop Grower.	New Bern	8.58	.36	1.80	2.16	2.63	**2.71**				19.13
8435	Patapsco Guano Co., Baltimore, Md.	Patapsco Special Tobacco Mixture.	Mebane	8.80	1.34	.82	2.16	2.63	**2.78**	2.78		7.57	19.40
8328	....do	....do	Rocky Mount	8.40	1.46	.70	2.16	2.63	3.09	3.09		4.50	19.38
8553	....do	Unicorn Guano	Seaboard	8.79	1.54	.60	2.14	2.60	**2.83**				19.37
8050	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Guano for Tobacco	Greensboro	8.40	1.06	.94	**2.00**	2.43	**2.95**	2.95		6.50	18.60
8511	Pocahontas Guano Co., Lynchburg, Va	Spot Cash Tobacco Compound	Semora	8.55	1.50	.88	2.38	2.89	**2.82**	2.82		7.65	20.08
8458	Reidsville Fertilizer Co., Reidsville, N. C.	Climax Fertilizer	Reidsville	8.93	1.32	.94	2.26	2.75	3.17				20.34
8186	Roberson, J. H., & Co., Robersonville, N. C.	Roberson's Special for Bright Tobacco.	Robersonville	**7.28**	2.34	.54	2.88	3.50	3.55	3.55		3.30	21.09
7914	Royster, F. S., Guano Co., Norfolk, Va	Orinoco Tobacco Guano	Lumberton	8.29	1.46	.74	2.20	2.67	**2.99**	2.99		7.90	19.33
8208	....do	....do	Thomasville	8.02	1.30	.82	2.12	2.58	**2.94**	2.94		8.27	18.72
8350	Southern Cotton Oil Co., Gibson, N. C.	All-to-good Fertilizer	Red Springs	8.69	.98	.98	**1.96**	2.38	3.88				19.71
8058	Southern Cotton Oil Co., Goldsboro, N. C.	Echo	Mount Olive	8.45	.50	1.70	2.20	2.67	3.68				20.23
8059	Swift Fertilizer Works, Wilmington, N. C.	Swift's Special Blood Guano for Cotton and Tobacco.	Mount Olive	**7.98**	1.40	.78	2.18	2.65	3.13	2.42	.71	1.82	19.13
8235	Venable Fertilizer Co., Richmond, Va.	Venable's Roanoke Special	Laurinburg	8.47	1.24	.86	2.10	2.55	**2.72**				18.80
7894	Va.-Car. Chemical Co., Richmond, Va.	Durham Fert. Co.'s N. C. Farmers' Alliance Official Guano.	Farmville	**7.85**	1.44	.94	2.38	2.89	3.84				20.57

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brands claiming			**8.00**			**2.06**	**2.50**	**3 00**				**$18.53**
8327	Va.-Car. Chemical Co., Richmond, Va.	Norfolk and Car. Co.'s Cooper's Bright Tobacco Fertilizer.	Farmville	9.41	.94	1.14	2 08	2.53	**2 59**	2 59		3 12	19.43
8296	....do	Powers, Gibbs & Co.'s Carolina Golden Belt Ammo. Guano.	Robersonville	8.58	1.18	1 06	2.24	2.72	3.25				20 03
7954	....do	Superlative Guano	Raleigh	8.80	1.00	1 28	2.28	2.77	3 94				21.15
8330	....do	Virginia State Fertilizer Co.'s Buffalo Guano.	Elizabeth City	8.38	1.06	1.24	2.30	2.80	3.79				20.68
	Brand claiming			**8.00**			**2 06**	**2.50**	**6 00**				**19.83**
8487	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Compound	Edenton	8.64	1.46	60	2.06	2.50	**5 81**				22.20
	Brands claiming			**8.00**			**2.06**	**2.50**	**4 00**				**19.63**
8154	Armour Fertilizer Works, Wilmington, N. C.	Armour's Berry King Fertilizer.	Wallace	**7.60**	86	1 14	**2 00**	2.43	**3.88**				**18.91**
8156	Navassa Guano Co., Wilmington, N. C.	Navassa Strawberry Top Dresser.	Wallace	8.05	.86	1 08	**1 94**	2 36	**3 21**				**18 34**
	Brands claiming			8.00			**2.26**	**2.75**	**2 00**				**18 21**
8373	North Carolina Cotton Oil Co., Henderson, N. C.	Brewer's Special	Wake Forest	8.39	.68	1.22	**1 90**	2.31	2.28				**17.47**
7912	North Carolina Cotton Oil Co., Raleigh, N. C.	Raleigh Standard Guano	Lumberton	**7.88**	.76	1.36	**2.12**	2.58	2.39				**17.99**
8186	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Favorite Cotton Grower	Mackeys Ferry	8.87	.88	1.50	2.38	2.89	3.22				20.81
8108	Va.-Car. Chemical Co., Richmond, Va.	Prolific Cotton Grower	Edenton	9.77	.62	1.52	**2.14**	2.60	2.14				19.49
8372	....do	Royal Crown	Raleigh	8.24	.90	1.12	**2.02**	2.46	**1.90**				**17.38**

	Brands claiming			**8.00**			**2.26**	**2.75**	**2.50**				**18.76**
8010	Hadley, Harris & Co., Wilson, N. C.	Hadley's Boss Guano	Wilson	8.22	.96	1.28	**2.24**	2.72	3.00				19.43
8226	Va.-Car. Chemical Co., Richmond, Va.	Delta	Washington	**7.95**	.62	1.66	2.28	2.77	3.28				19.65
	Brand claiming			**8.00**			**2.26**	**2.75**	**3.00**				**19.31**
7931	Va.-Car. Chemical Co., Richmond, Va.	Blue Star	Elizabeth City	8.70	1.88	1.24	**2.12**	2.58	**2 46**				**18.80**
	Brand claiming			**8.00**			**2.26**	**2.75**	**3.25**				**19.59**
8232	North Carolina Cotton Oil Co., Henderson, N. C.	McKinne Tobacco Mixture	Louisburg	8 11	1.28	.90	**2.18**	2.65	3 62	.17	3.45	.12	19.78
	Brands claiming			**8.00**			**2.47**	**3 00**	**2 00**				**19 03**
8312	Farmers Cotton Oil Co., Wilson, N. C.	Wilson High Grade Guano	Farmville	8.09	1.02	1.56	2 58	3.14	2 41				19 99
8192	Va.-Car. Chemical Co., Richmond, Va.	Charlotte Oil and Fert. Co.'s Special 3 Per Cent Guano.	Raeford	8.14	.98	1.46	**2 44**	2.97	2.08				19 13
8409	----do	Powers, Gibbs & Co.'s Standard Guano.	Roseboro	8.42	1.20	1.84	2.54	3.09	2.39				20.11
	Brands claiming			**8.00**			**2 47**	**3 00**	**2 50**				**19 58**
8151	Acme Mfg. Co., Wilmington, N. C.	Acme Fertilizer	Maxton	8.85	1.88	46	**2.34**	2.84	2 63				19.98
8400	----do	Acme Fertilizer for Tobacco	Spring Hope	**7.77**	1.40	1.10	2 50	3.04	2 94	2.94		7 62	19 98
8044	Contentnea Guano Co., Wilson, N. C.	Contentnea Cotton Grower	Wilson	8.68	1.06	1.54	2.60	3.16	2 86				21 10
8165	North Carolina Cotton Oil Co., Wilmington, N. C.	Wilmington Standard	Wilmington	**7.56**	.98	1 40	**2.38**	2.89	2 67				**19 02**
8323	Va.-Car. Chemical Co., Richmond, Va.	Split Silk	Rockingham	**7.89**	1.24	1 28	2.52	3.06	3 15				20 39
	Brands claiming			**8.00**			**2.47**	**3.00**	**3.00**				**20.13**
7907	Acme Mfg. Co., Wilmington, N. C.	Pee Dee Special	Lumberton	8.30	1.42	1.10	2.52	3.06	3.17				20.78
8317	American Agricultural Chemical Co., New York, N. Y.	Lazaretto Challenge Fertilizer	Gastonia	8.87	2.06	.66	2.72	3.31	**2 91**				21.79
7830	----do	Lazaretto Special Tobacco and Potato Fertilizer.	Edenton	8.32	1.84	.92	2.76	3.36	3.18	3 18		6 12	21.75
7830	American Fertilizer Co., Norfolk, Va.	American Eagle Guano	Selma	9.38	1.52	1.02	2.54	3.09	**2 90**				21 54
8509	----do	Miller & Co.'s Yellow Leaf Fertilizer.	Ruffin	8.90	1.60	.90	2 50	3.04	3.03	3.03		2 95	21 09
7908	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer.	Lumberton	**7 75**	1.38	1.00	**2.38**	2.89	3.07				**19 63**
7985	----do	Armour's Tobacco Special	Oxford	8.14	1.80	.86	2.66	3.23	3 25	1.60	1.65	1 20	21 27
8106	Arps, Geo. L., & Co., Norfolk, Va.	Arps' Quick Growth for All Crops.	Edenton	8.32	1.54	.84	**2 38**	2 89	**2 97**				**20 04**

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
				MIXED FERTILIZERS.									
	Brands claiming			**8.00**			**2.47**	**3.00**	**3.00**				**$20 13**
7886	Baugh & Sons Co., Norfolk, Va.	Baugh's High Grade Tobacco Guano.	Farmville	8.05	1.74	.92	2.66	3.23	3.12	3.12		4.85	21.05
7842	do	Grand Rapids High Grade Truck Guano.	Maxton	8.64	1.52	1.10	2.62	3.19	3.19				21.50
8502	Blackstone Guano Co., Blackstone, Va.	Jim Crow for Tobacco	Roxboro	10.10	1.52	.42	**1.94**	2.36	**1.97**	1.97		5.62	**18.82**
8101	Berkley Chemical Co., Norfolk, Va.	Advance Crop Grower	Four Oaks	8.50	1.64	.86	2.50	3.04	**2.98**				20.68
8281	do	Berkley Tobacco Guano	Richland	8.58	1.70	.78	2.48	3.02	3.21	3.21		6.15	20.92
8318	Bradley Fertilizer Co., Boston, Mass.	Bradley's High Grade Guano	Charlotte	9.38	1.56	1.02	2.58	3.14	3.59				22.45
7844	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Best	Maxton	8.30	1.36	1.26	2.62	3.19	3.29				21.51
8047	do	Tobacco Queen	Fremont	8.67	1.62	1.16	2.78	3.38	3.02	3.02		7.35	21.97
8503	Camp, N. H., Petersburg, Va.	Lion and Monkey Brand Tobacco Fertilizer.	Roxboro	8.48	1.18	1.22	**2.40**	2.92	3.48	3.48		10.20	20.82
8599	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Electric Ammoniated Guano	Lexington	**7.98**	1.22	1.06	**2.28**	2.77	**2.97**				**19.34**
7893	do	Horne's Best	Farmville	8.20	.96	1.52	2.48	3.02	3.33				20.71
8230	Clayton Oil Mill, Clayton, N. C.	Clayton Guano	Wake Forest	8.47	1.26	1.16	**2.42**	2.94	3.20				20.58
8468	do	Clayton Special Tobacco Grower	Clayton	**7.97**	.62	1.94	2.56	3.11	3.19	.10	3.09	.08	20.66
7918	Columbia Guano Co., Norfolk, Va.	Hyco Tobacco Guano	Lumberton	8.47	1.40	1.16	2.56	3.11	**2.95**	2.95		8.52	20.85
8479	do	Olympia Cotton Guano	Hickory	**7.54**	2.12	.60	2.72	3.31	3.07				20.77
8045	Contentnea Guano Co., Wilson, N. C.	Pine Leaf Tobacco Fertilizer	Wilson	8.36	1.44	1.40	2.84	3.45	3.11		3.11		22.02

8519	----do----------	Top Notch Fertilizer----------	Black Creek-----	8.25	.98	1.70	2.68	3.26	3.19	------	------	------	21 38
8088	Conestee Chemical Co., Wilmington, N. C.	Conestee Special Fertilizer-----	Dunn----------	8.04	1.20	1.26	**2.48**	2.99	3.03	------	------	------	20.16
8408	Craven Chemical Co., New Bern, N. C.	Foy's High Grade Guano------	Clinton----------	8.12	1.42	.68	**2.10**	2.55	**2.98**	------	------	------	**18.78**
3935	Eastern Cotton Oil Co., Hertford, N. C.	Rain Proof Cotton Grower-----	Edenton--------	8 47	------	------	2 50	3.04	3.45	------	------	------	21 17
3954	----do----------	----do----------	Edenton--------	8.38	------	------	2 58	3.14	3 42	------	------	------	21.36
8261	Farmers Guano Co., Raleigh, N. C.----	Golden Grade Guano----------	Mount Gilead----	**6 23**	1.30	1 60	2 90	3 53	3.90	------	------	------	21 21
7889	Farmers Cotton Oil Co., Wilson, N. C.--	Golden Gem Guano----------	Farmville------	8.50	1.00	1.42	**2 42**	2 94	3 03	------	------	------	20 42
7845	Floradora Guano Co., Laurinburg, N. C.	Oceola----------	Maxton--------	9.34	.94	1.42	**2 36**	2.87	3 73	------	------	------	21 71
8009	Hadley, Harris & Co., Wilson, N. C.---	Golden Weed Tobacco Grower	Wilson----------	8.17	1 62	.88	2 50	3 04	**2 95**	2 95	------	8.35	20 35
7950	Hampton Guano Co., Norfolk, Va.------	Hampton Tobacco Guano-----	Ayden----------	8.64	1.74	.82	2 56	3 11	**2 94**	2.94	------	5.55	20 99
8273	----do----------	Princess Prolific Producer-----	Clinton----------	8.17	1.98	.64	2 62	3.19	3.03	------	------	------	20 90
8369	Hubbard Fertilizer Co., Baltimore, Md..	Hubbard's Royal Ensign------	Maury----------	**7.84**	1.02	1.42	**2 44**	2.97	4 81	------	------	------	21 86
7890	----do----------	Hubbard's Yellow Wrapper Guano for Tobacco, Cotton and Peanuts.	Farmville------	8.81	1 78	64	**2 42**	2 94	3 42	3 42	------	9 75	21 13
8483	Imperial Fertilizer Co., Norfolk, Va.---	Imperial Tobacco Guano------	Greensboro------	8.57	2.00	.62	2.62	3 19	3.19	3 19	------	7.60	21.44
8523	----do----------	X. L. O. Cotton Guano--------	Norfleet--------	8 05	1.54	.96	2.50	3 04	3 74	------	------	------	21.11
7896	Martin, D. B., Co., Richmond, Va.-----	Martin's Special Tobacco Products.	New Bern-------	8.47	1.60	.52	**2 12**	2.58	**2 69**	2 69	------	2.70	**18 85**
7857	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Gold Leaf Tobacco Guano.	Greenville------	8.62	.76	1.60	**2.36**	2.87	3.24	3 24	------	5.97	20 29
8175	Miller Fertilizer Co., Baltimore, Md.---	Standard Phosphate----------	Henderson------	8.00	1.38	1.22	2.60	3.16	3 17	------	------	------	20 83
8392	----do----------	Tobacco King----------	Benehan--------	**7.99**	1.50	1.08	2.58	3.14	3.12	3 12	------	8 07	20 68
8402	Navassa Guano Co., Wilmington, N. C.--	Clarendon Tobacco Guano-----	Spring Hope-----	8.61	1 22	1.02	**2 24**	2 72	3.43	3 43	------	6.35	20 26
8118	----do----------	Navassa High Grade Guano----	Red Springs-----	9 05	.66	1.26	**1.92**	2.33	**2 01**	------	------	------	**19 84**
8253	New Bern Cotton Oil and Fertilizer Co., New Bern, N. C.	Foy's High Grade Fertilizer----	Hookerton------	8.52	.88	2 02	2.90	3.53	3 79	------	------	------	23 15
7906	----do----------	Lenoir Bright Leaf Tobacco Grower.	New Bern-------	8.96	.90	1.86	2.76	3.36	3 05	10	2.95	08	22 18
7850	North Carolina Cotton Oil Co., Wilmington, N. C.	Wilmington High Grade-------	Maxton----------	8.35	1.02	1 38	**2.40**	2.82	3.08	------	------	------	20 26
8262	Norfolk Fertilizer Co., Norfolk, Va.----	Oriana for Cotton----------	Mount Gilead----	8 29	1.70	.90	2.60	3 16	3.14	------	------	------	21 05
8254	Ober, G., & Sons Co., Baltimore, Md.--	Ober's Special Compound for Tobacco.	Snow Hill-------	8.70	1 62	.86	2.48	3.02	3 58	3 58	------	5 77	21.44

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brands claiming			**8.00**			**2.47**	**3.00**	**3.00**				**$20.13**
7975	Pamlico Chemical Co., Washington, N. C.	Success Guano	Bayboro	8.12	.74	2.12	2.86	3.48	4.24				23.13
7876	----do	Tobacco Growers' Friend	Washington	8.36	.68	2.00	2.68	3.26	3.82	3.82		4.17	22.18
8224	Patapsco Guano Co., Baltimore, Md.	Choctaw Guano	Washington	9.27	2.00	.74	2.74	3.33	3.30				22.66
8275	Pearsall & Co., Wilmington, N. C.	Pearsall's High Grade Use Me Guano.	Burgaw	8.29	1.18	1.02	**2.20**	2.67	5.06				21.61
8552	----do	Pearsall's High Grade Tobacco Guano.	Rose Hill	**7.47**	1.20	1.14	2.34	2.84	5.08	5.08		15.00	21.44
8204	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Levering's Reliable Tobacco Guano.	Everetts	7.39	1.46	1.28	2.74	3.33	3.36	3.36		9.40	21.03
7935	----do	Piedmont High Grade Ammoniated Bone and Potash.	Plymouth	8.56	1.44	1.08	2.52	3.06	3.45				21.33
8042	Pine Level Oil Mill Co., Pine Level, N. C.	Pine Level High Grade Fertilizer.	Princeton	9.20	.94	1.78	2.72	3.31	3.01				22.20
8512	Pocahontas Guano Co., Lynchburg, Va.	Armour's Favorite Guano, Apex Brand.	Semora	8.32	2.02	.62	2.64	3.21	3.28				21.39
7834	Pocomoke Guano Co., Norfolk, Va.	Harvey's High Grade Monarch	Edenton	8.27	1.84	.90	2.74	3.33	3.05				21.48
8223	----do	Monarch Tobacco Grower	Washington	8.66	2.44	1.04	3.48	4.23	4.12	4.12		7.10	25.90
8340	Powhatan Chemical Co., Richmond, Va.	P. C. Co.'s Hustler	Edenton	8.44	2.00	.86	2.86	3.48	3.00				22.05
8460	Reidsville Fertilizer Co., Reidsville, N. C.	Royal Fertilizer	Reidsville	8.49	.74	1.70	**2.41**	2.93	3.17				20.64
8021	Richmond Guano Co., Richmond, Va.	Gilt Edge Fertilizer	Washington	8.45	1.50	1.12	2.62	3.19	3.02				21.14
7862	Robertson Fertilizer Co., Norfolk, Va.	Big Cropper High Grade Guano	Greenville	**7.98**	1.62	.94	2.56	3.11	3.32				20.82
8316	----do	Robertson's Special Formula for Tobacco.	Kings Mountain	8.60	1.44	1.12	2.56	3.11	3.54	3.54		9.75	21.62

7860	Royster, F. S., Guano Co., Norfolk, Va.	Bonanza Tobacco Guano	Greenville	8.09	1.40	1 22	2.62	3.19	**2.93**	2.93	7 97		20.72
8189	----do	Marlboro High Grade Cotton Grower.	Fayetteville	8.06	1.62	.90	2.52	3.06	3.03				20 41
8085	Southern Cotton Oil Co., Fayetteville,	Fayetteville Oil Mill Special Cotton Grower.	Fayetteville	8.70	.76	1.66	2.42	2 94	3.25				20.84
8427	Southern Cotton Oil Co., Gibson, N. C.	Moon High Grade Fertilizer	Apex	8.49	1.30	1 26	2.56	3 11	3.43				21 40
8145	----do	Peacock High Grade Fertilizer	Laurinburg	8.57	1.56	1.16	2 72	3.31	3.85				22.55
8448	Southern Cotton Oil Co., Goldsboro, N. C.	Edgerton's Old Reliable	Goldsboro	8.04	.80	1.74	2.54	3 09	3.53				21 05
7942	----do	Special Cotton Grower	Goldsboro	**7 22**	.70	1.92	2.62	3.19	3 78				20.87
7941	----do	Thompson's Special Cotton and Tobacco Guano.	Goldsboro	9.01	.94	1.86	2 80	3.40	5 25	5 25	4 85		24 80
8365	Southern Cotton Oil Co., Wilson, N. C.	Morning Glory	Maury	8.33	.92	1.64	2.56	3.11	3 08				20 87
8041	----do	Special Cotton Grower	Wilson	8.91	.56	1.48	**2.04**	2.48	3.16				**19 45**
7852	Southern Exchange Co., Maxton, N. C.	Jack's Best Fertilizer	Maxton	8.36	1.88	.88	2.76	3.36	3.37				21 99
8587	----do	R. M. C. Special Crop Grower	Red Springs	8.41	1.44	1.18	2.62	3.19	3 10				21 20
8020	Swift Fertilizer Works, Wilmington, N. C.	Swift's Carolina H. G. Tobacco Grower.	Phillips	9.20	1.42	1.04	**2.46**	2.99	**2 98**	1 13	1.85	85	21.15
3934	Swift Fertilizer Works, Atlanta, Ga.	----do	Washington	8.64			**2.38**	2.89	**2 91**	2 91	6 82		20 26
8246	----do	Swift's Ruralist, H. G.	Mooresville	8.55	1.30	1.16	**2.46**	2.99	**2 92**				20.50
7948	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Cotton Special	Ayden	8.90	1.74	.86	2.60	3.16	**2 92**				21.36
8437	----do	Tuscarora Tobacco Special	Mebane	8.01	1.38	.92	**2 30**	2 80	3.23	2 13	1.10	1 60	**19 73**
8488	Union Abattoir Co., Norfolk, Va.	Red Standard Cotton Guano	Edenton	8.34	1.86	.36	**2 26**	2.75	**2.98**				**19.60**
8248	Union Guano Co., Winston, N. C.	Union Homestead Guano	Pineville	8.19	1.66	.72	**2 38**	2.89	**2 92**				**19 86**
8234	----do	Victoria High Grade Tobacco Fertilizer.	Wake Forest	8.92	1.56	1.06	2 62	3.19	**2 88**	2.88	2.50		20.96
7938	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's High Grade Manure.	Selma	8.34	1.56	1.00	2.56	3.11	**2.57**				20.32
8516	----do	Davie & Whittle's Owl Brand Guano.	Semora	8.31	1.36	1.22	2.58	3.14	**2 99**				20.83
8294	----do	Diamond Cotton Seed Guano	Robersonville	8.29	1.02	1.48	2.50	3.04	**2.92**				20 42
7919	----do	Farmers' Success	Lumberton	8.40	1.94	1.02	2.96	3.60	3.99				24 62
7960	----do	Norfolk and Car. Chem. Co.'s Bright Leaf Tobacco Grower	Washington	**7 94**	.98	1 18	**2.16**	2 63	3 16	3 16	5 87		**19 05**
8255	----do	Old Dominion Guano Co.'s Farmers' Friend Fertilizer.	Hookerton	9.03	1.54	1.00	2.54	3.09	3.51				21 89

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
				MIXED FERTILIZERS.									
	Brands claiming			**8 00**			**2 47**	**3 00**	**3 00**				**$20 13**
7962	Va.-Car. Chemical Co., Richmond, Va.	Old Dom. Guano Co.'s Farmers' Friend Special Tobacco Fert.	Washington	8.09	1.00	1.26	**2 26**	2 75	3 19	3 19		5.70	**19 60**
8405	----do	Peruvian Guano Crop Grower	Spring Hope	8 01	1.52	.94	**2.46**	2 99	**2 65**				**19 72**
8249	----do	Powers, Gibbs & Co.'s Old Kentucky Tobacco Manure.	Pineville	9 00	2 06	.36	**2 42**	2.94	**2 71**	2 71		4 55	20 52
7979	----do	Travers' Big Leaf Tobacco Grower.	Durham	9 85	1.74	1 08	2.82	3.43	3 08	1 33	1.75	1 00	23 25
7940	----do	Yellow Leaf Tobacco Guano	Selma	9.19	1.58	.86	**2 44**	2.97	**2 79**	2.79		2 27	20.85
8178	Venable Fertilizer Co., Richmond, Va.	High Grade Tobacco Fertilizer	Middleburg	**7.89**	1.88	.78	2 66	3 23	3 54	1.30	2 24	.97	21 37
8136	Young, J. R., Fertilizer Co., Norfolk, Va.	Young's Special Guano for Cotton.	Edenton	8 07	1.34	1.14	2.48	3 02	3 13				20 38
7835	Winborne Guano Co., Norfolk, Va.	Winborne King Farming Guano	Edenton	8 20	2.02	.96	2.98	3 62	3 00				22 30
	Brands claiming			**8 00**			**2 47**	**3 00**	**4 00**				**21 23**
8472	Farmers Cotton Oil Co., Wilson, N. C.	Newsome's Tobacco Special Guano.	Lucama	8 20	.94	1.48	**2 42**	2 94	4 63	.17	4.46	.13	21 91
8416	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Royal Ensign	Washington	8 78	2 06	.62	2 68	3 26	4.73				23 56
8196	Martin, D. B., Co., Richmond, Va.	Privott's Favorite Guano	Edenton	**7.97**	1 84	.36	**2 20**	2 67	4 27				**20 45**
8062	Pine Level Oil Mill Co., Pine Level, N. C.	Hall's Special Fertilizer for Tobacco.	Mount Olive	8.59	.94	1.48	**2 42**	2.94	4.11	4 11		7 18	21 69
7916	Southern Exchange Co., Maxton, N. C.	Bull of the Woods	Lumberton	8.12	1 86	.66	2 52	3.06	4 14				21.69
8160	Va.-Car. Chemical Co., Richmond, Va.	Charlotte Oil and Fert. Co.'s Groom's Spc. Tobacco Fert.	Wallace	8.13	1 12	1.34	**2 46**	2 99	**3 99**	3 99		4 27	21 30

8605	----do----	V.-C. C. Co.'s Lion High Grade Fertilizer.	Edenton	8.11	.96	1.48	2.44	2.97	4.51					21.72
	Brands claiming			**8.00**			**2.47**	**3.00**	**5.00**					**22 32**
8046	Contentnea Guano Co., Wilson, N. C.	Special Formula for Tobacco	Wilson	9.26	1.06	1.48	2.54	3.09	5.11	1.66	3 45	1.25		23 86
8263	Patapsco Guano Co., Baltimore, Md.	Patapsco Plant Food for Tobacco, Potatoes and Truck.	Carthage	8.62	1.48	.94	**2.42**	2 94	**4.65**	4.65		4.67		**22 31**
	Brand claiming			**8.00**			**2 88**	**3 50**	**5.00**					**23 93**
8099	Farmers Cotton Oil Co., Wilson, N. C.	Regal Tobacco Guano	Smithfield	8.07	1.30	1 64	2 94	3.57	**4.99**	.23	4.76	.17		24 22
	Brand claiming			**8 00**			**2 88**	**3 50**	**7.50**					**26 64**
8413	Camp, W. H., Petersburg, Va.	Yellow Head—Camp's Prepared Chemicals.	Wilmington	8.74	2.82	.36	3.18	3.87	8.16					29.24
	Brand claiming			**8.00**			**3.29**	**4.00**	**4 00**					**24 47**
7991	Acme Mfg. Co., Wilmington, N. C.	Quick Step Fertilizer	Fremont	8 72	1.74	1.40	**3 14**	3.82	3 96					**24 45**
8540	American Fertilizer Co., Norfolk, Va.	N. C. and S. C. Cotton Grower	Edenton	8.35	1.94	1.18	**3.12**	3.79	4 02					**24 10**
8441	Armour Fertilizer Works, Wilmington, N. C.	Armour's Special Trucker	Garland	8.40	1.58	1.20	**2 78**	3.38	**3 86**					**22 65**
8105	Arps, Geo. L., & Co. Norfolk, Va.	Arps' "Go-a-Head" Guano for Trucks, Cotton and Tobacco.	Edenton	8 22	1.04	1.52	**3.16**	3.84	4 13	4.13		9.40		**24 26**
7909	Baugh & Sons Co., Norfolk, Va.	Baugh's Fish, Bone and Potash	Lumberton	8.25	2.10	1.26	3.36	4 09	4 34					25 30
8180	Burton, C. J., Guano Co., Baltimore, Md.	Burton's High Grade Tobacco Fertilizer.	Everetts	8.05	2.24	1.14	3.38	4.11	**3 99**	3.99		8 52		24.81
8308	----do----	J. W. C. Special Fertilizer	Maxton	8.52	2.20	1.30	3.50	4.26	4.41					26 17
8309	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special 8-4-4	Maxton	8.32	1.60	1.70	3.30	4.00	4 90					25.75
8297	Columbia Guano Co., Norfolk, Va.	Pelican Ammoniated Guano	Bethel	8.37	2.12	1.42	3.54	4.30	4 43					26 21
8174	----do----	Trojan Tobacco Guano	Franklinton	8.04	2.08	1.06	**3 14**	3.82	4.09	4 09		7 75		**23 98**
8304	Craven Chemical Co., New Bern, N. C.	Hanover Standard Guano	Jacksonville	8.03	2.30	1.10	3.40	4.13	5.31					26.33
7864	Eastern Cotton Oil Co., Hertford, N. C.	Mat White Special	Hertford	**7.82**	1.50	1.88	3.38	4.11	4 44					**23.12**
7846	Floradora Guano Co., Laurinburg, N. C.	Floradora	Maxton	8.99	1.88	1.38	**3.26**	3.96	4.60					25.84
8341	Hampton Guano Co., Norfolk, Va.	Little's Favorite Crop Grower	Sunbury	8.38	2.06	1.14	**3 20**	3.89	**3 16**					**23 50**
8221	Imperial Co., Norfolk, Va.	Tobacco Grower	Washington	8.10	2.06	1.14	**3.20**	3 89	3.58	3.85		7.45		**23.71**
7988	Martin, D. B., Co., Richmond, Va.	Martin's Red Star Brand Fertilizer.	Goldsboro	**7.47**	3.64	.52	4 16	5.06	4.35					27.73
7858	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Ideal Tobacco Guano	Greenville	8.28	1.82	1.74	3.56	4.33	4 48	4 48		3.50		26.26

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brands claiming			**8.00**			**3 29**	**4.00**	**4.00**				**$24 47**
7849	Miller Fertilizer Co., Baltimore, Md.	Miller's Irish Potato	Maxton	8.00	2.58	1.22	3.80	4.62	4.42				26.91
8549	Navassa Guano Co., Wilmington, N. C.	Coree Tobacco Grower	Rose Hill	9.04	2.40	70	3 10	3 77	**3.88**	.23	3.65	.17	24.49
8029	----do	Navassa Special Truck Guano	Wilmington	8.70	1 72	1.22	**2 94**	3 57	5 35				25.18
8119	N. C. Cotton Oil Co., Wilmington, N. C.	Wilmington Truck Grower	Maxton	8.08	1.70	1.46	**3 16**	3 84	**3 98**				**23 97**
7949	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Oriole Tobacco Grower	Kinston	9.29	.94	2.22	**3 18**	3.84	4.67	.37	4 30	.28	25.82
8536	Pamlico Chemical Co., Washington, N. C.	Bull's Eye Tobacco Grower	Washington	9.05	1.46	1.50	**2.96**	3 60	**3 82**	2.66	1.16	2 00	**23.87**
8225	----do	Pamlico Guano	Washington	8.70	1 32	2.08	3.40	4 13	4 98				26.57
8555	Patapsco Guano Co., Baltimore, Md.	Patapsco Tobacco Special	Seaboard	8.42	1.96	.96	**2 92**	3.55	**3 85**	3.85		7.17	**23.20**
8146	Pearsall & Co., Wilmington, N. C.	Pearsall's Bone, Meal and Fish Potash for Tobacco and Cot'n.	Maxton	8.69	1.10	1.52	**2.62**	3.19	4.30	4.30		7.00	**22.77**
8276	----do	Pearsall's Fish and Potash Compound.	Burgaw	**7.92**	1.88	1.60	3 48	3 02	4 72				25.89
8245	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Unexcelled Guano	Pineville	8.16	2.62	.91	3.56	4.33	**3.50**				25.08
8061	Pine Level Oil Mill Co., Pine Level, N. C.	Oliver's Truck Grower Guano	Mount Olive	8.84	1.64	1.56	**3 20**	3.89	4.60				25.50
8147	Pocomoke Guano Co., Norfolk, Va.	Faultless Ammoniated Superphosphate.	Laurinburg	8.57	1.80	.52	3.32	4.04	4 20				25 28
7974	Powhatan Chemical Co., Richmond, Va.	North Star Special	Kinston	8.54	1.44	2.16	3.60	4.38	**3.96**				26.08
8086	Royster, F. S., Guano Co., Norfolk, Va.	Jupiter High Grade Guano	Fayetteville	8 16	2.04	1.30	3.34	4 06	4.10				24 88
8285	----do	Milo Tobacco Guano	Seven Springs	9.69	1.90	1 08	**2.98**	3 62	**3 43**	3.43		6.35	**24.11**

8452	----do	Truckers' Delight	Greensboro	8.54	2.46	.84	3.30	4.01	4.03				24.99
8191	Southern Cotton Oil Co., Fayetteville, N. C.	Southern Cotton Oil Co.'s Special Mixture.	Fayetteville	8.37	1.36	1.62	2.98	3.62	4.76				24.39
7853	Swift Fertilizer Works, Atlanta, Ga.	Swift's Monarch Vegetable Grower.	Maxton	8.72	1.36	1.72	3.08	3.74	3.99				24.25
8497	----do	Swift's Vegetable Grower	Nashville	8.47	.66	1.38	2 04	2.48	2 20				18 00
8247	Union Guano Co., Winston, N. C.	Union Premium Guano	Pineville	9.12	1.80	1.10	2 90	3.53	3.15				22.98
8017	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special	Bruce	8.89	2 72	1.20	3.92	4.77	3.46				27.09
7946	----do	----do	Kinston	8.62	1.78	1.44	3.22	3.91	2.96				23.57
	Brands claiming			**8.00**			**3.29**	**4.00**	**5.00**				**25 57**
8220	American Fertilizer Co., Norfolk, Va.	Peruvian Mixture	Mackey's Ferry	8.72	2.50	.96	3.46	4.21	2.99				24 63
7995	Va.-Car. Chemical Co., Richmond, Va.	Truck Farmers' Special Ammoniated Guano.	Elizabeth City	8.05	1.84	1.26	3.10	3.77	4.73				24 54
	Brand claiming			**8.00**			**3.71**	**4.51**	**7.00**				**29.37**
8007	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Best Guano	Wilson	8.54	40	3.18	3.58	4.35	6.62				28.93
	Brands claiming			**8.00**			**4.12**	**5.00**	**5.00**				**28.77**
8469	Clayton Oil Mill, Clayton, N. C.	C. W. H. Special	Clayton	8.75	1.76	2.16	3.92	4.77	5.59				29.31
7903	Meadows, E. H. & J. A., Co., New Bern, N. C.	Labos Brand	New Bern	8.17	2 04	1.94	3.84	4.79	5.55				28.82
	Brands claiming			**8.00**			**4.12**	**5.00**	**7.00**				**30 93**
8534	Martin, D. B., Co., Baltimore, Md.	Martin's Animal Bone Potato Guano.	Edenton	6.24	3.12	.40	3.52	4.28	7.07				27.12
7851	Southern Exchange Co., Maxton, N. C.	McKinnon's Special Truck Formula.	Maxton	8.04	3 32	.88	4 20	5 11	7 21				31.55
	Brand claiming			**8.00**			**5.77**	**7 00**	**5 00**				**35 20**
7888	Bragaw Fertilizer Co., Washington, N. C.	Riverview Trucker	Washington	8.03	3.28	2.62	5.90	7.17	5.49				35 71
	Brand claiming			**8.50**			**1.65**	**2 00**	**1.50**				**15 74**
8393	American Fertilizer Co., Norfolk, Va.	Peruvian Mixture	Willardville	8.80	.54	1 20	1 74	2.11	1.68				16 55
	Brands claiming			**8.50**			**1 65**	**2 00**	**2.00**				**15 82**
8314	Armour Fertilizer Works, Wilmington, N. C.	Armour's Standard Cotton Grower Fertilizer.	Fountain	8.14	1.06	.64	1.70	2.07	2.00				16 16
7997	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Superphosphate	Elizabeth City	8.24	.98	64	1 62	1 97	1 98				15 89

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.									Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	
				MIXED FERTILIZERS.									
	Brand claiming			**8 50**			**2.26**	**2 75**	**2 00**				**$18.66**
8218	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Tobacco Fertilizer.	Marshall	**8 17**	1.04	1 16	**2 20**	2.67	2.55	2.55		5.50	18.74
	Brand claiming			**8 50**			**2.06**	**2.50**	**2.50**				**18 43**
8436	Pocomoke Guano Co., Norfolk, Va.	Cinco Tobacco Guano	Mebane	8.99	1.60	.68	2 28	2.77	**2 45**	2 45		4.47	19.68
	Brand claiming			**9 00**			**82**	**1.00**	**1.00**				**12.40**
8546	Reidsville Fertilizer Co., Reidsville, N. C.	Reidsville Hustler	Reidsville	9.24	.68	.60	1.28	1.56	2.25				13.78
	Brands claiming			**9.00**			**.82**	**1.00**	**2 00**				**13 50**
8432	Ober, G., & Sons Co., Baltimore, Md.	Ober's Farmers' Mixture	Oxford	9 22	.30	.72	1.02	1.24	2.04				14.52
8078	Patapsco Guano Co., Baltimore, Md.	Coon Brand Guano	Concord	**8 74**	.56	.62	1.18	1.43	3.09				15.87
7982	Rasin-Monumental Co., Baltimore, Md.	Rasin's Baltimore Special Mixture.	Durham	9.90	.26	.80	1.06	1.29	**1.85**				15.08
	Brand claiming			**9.00**			**.82**	**1.00**	**3.00**				**14 60**
8396	Va.-Car. Chemical Co., Richmond, Va.	Barnhardt's Grain and Crop Guano.	Andrews	10.31	.22	.64	.86	1.05	2.31				15.17
	Brands claiming			**9.00**			**1.65**	**2 00**	**1.00**				**15.63**
8155	Navassa Guano Co., Wilmington, N. C.	Navassa Complete Fertilizer	Wallace	**8.41**	1.32	.86	2.18	**2.85**	3.21				19.60
8095	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano.	Durham	9.42	.82	.84	1.66	2.02	1.08				16.14
	Brands claiming			**9.00**			**1.85**	**2.00**	**2 00**				**18.73**
8131	Holmes & Dawson, Norfolk, Va.	Gold Dust Guano	Williamston	**8.91**	1.04	.64	1.68	2.04	2.02				16.79

8387	----do----	Triumph Soluble Guano	Edenton	**8.69**	1.12	.60	1 72	2.09	2.06				16.79
8422	Ober, G., & Sons Co., Baltimore, Md.	Special Ammoniated Dissolved Bone.	Norwood	9.19	.92	1.00	1.92	2 33	2 50				18.51
8455	Pocahontas Guano Co., Norfolk, Va.	Yellow Tobacco Special	Brown Summit	9.35	.98	.78	1.76	2 14	2 39	2 39		6 62	17.91
	Brands claiming			**9.00**			**1.65**	**2 00**	**3.00**				**17 83**
7989	Craven Chemical Co., New Bern, N. C.	Prolix Special Guano	Fremont	**8 87**	.42	1.14	**1 56**	1.89	3 22				**17 61**
8353	Union Guano Co., Winston, N. C.	Farmers' Blood and Bone Guano.	Red Springs	9.10	.90	.74	**1 64**	1 99	3 37				18 29
	Brand claiming			**9.00**			**1.85**	**2 25**	**1 00**				**16 41**
8269	Bradley Fertilizer Co., Boston, Mass.	Standard Sea Fowl	Charlotte	9.22	1.28	.70	1.98	2 41	1 46				17.63
	Brands claiming			**9.00**			**1 85**	**2 25**	**4 00**				**20 71**
8259	American Agricultural Chemical Co., New York, N. Y.	Lazaretto Animal Bone Fertilizer.	Carthage	9.18	1 50	.66	2.16	2.63	4.00				21.09
8102	Berkley Chemical Co., Norfolk, Va.	Monitor Animal Bone Fertilizer	Four Oaks	9.07	.94	1.00	1.94	2.36	**3 90**				**20 02**
	Brand claiming			**9.00**			**2.06**	**2.50**	**2 00**				**18 33**
8574	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Special Tobacco Guano.	Rockford	10.22	.86	.68	**1.54**	1.87	**2 00**	.17	1 83	13	**17 40**
	Brand claiming			**9.00**			**2.06**	**2.50**	**2 50**				**18 88**
8585	Scotland Neck Guano Co., Scotland Neck, N. C.	Our Favorite	Nashville	9.62	.48	1.52	**2 00**	2.43	3.00				19 75
	Brands claiming			**9 00**			**2.06**	**2.50**	**3 00**				**19 43**
8397	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Soluble Guano.	Hendersonville	9.14	1.10	.70	**1.80**	2 19	3 03				**18 58**
8559	----do----	Old Dominion Horne's Cotton Fertilizer.	Norwood	9.18	1.08	1.04	2.12	2.58	**2.77**				19 58
	Brand claiming			**9.00**			**2.08**	**2.50**	**5.00**				**21 63**
8477	Va.-Car. Chemical Co., Richmond, Va.	Sun Brand Guano	Coats	9.54	2.30	.28	2.58	3.14	**4.25**				23 32
	Brands claiming			**9 00**			**2.28**	**2.75**	**2.00**				**19 11**
7990	Acme Mfg. Co., Wilmington, N. C.	Acme Cotton Grower	Goldsboro	9.35	.88	1.28	**2.18**	2.63	**1.93**				**18 96**
8132	Baugh & Sons Co., Norfolk, Va.	Hassell's Tobacco Grower	Williamston	9.58	1.02	1.18	**2 20**	2.67	2.35	2 35		5 70	19.79
8014	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Prolific Tobacco and Cotton Grower.	Wilson	**7.05**	.94	1.42	2.36	2.87	2.51	2 51		6.07	**18 31**
8064	Columbia Guano Co., Norfolk, Va.	Columbia Special	Bowden	9.65	.82	1.58	2.40	4.13	2 29				20 56
8130	Imperial Co., Norfolk, Va.	Martin County Special Crop Grower.	Williamston	9.20	1.82	.60	2.42	2.94	2.15				20.08

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
				MIXED FERTILIZERS.									
	Brands claiming			**9.00**			**2.26**	**2.75**	**2.00**				**$18.11**
8148	MacMurphy Co., Charleston, S. C.	Wilcox, Gibbs & Co.'s Manipulated Guano.	Maxton	9.44	1.18	1.48	2.66	3.23	2.50				21.62
8184	Martin, D. B., Co., Richmond, Va.	Martin's Tobacco Compound	Robersonville	**8.44**	1.82	.40	**2.22**	2.70	2.38	2.38		6.52	**18.87**
8403	N. C. Cotton Oil Co., Wilmington, N. C.	Wilmington Prolific Crop Grower	Nashville	9.52	.92	1.08	**2.00**	2.43	2.83				19.48
8166	....do	Wilmington Mortgage Lifter	Wilmington	9.29	.84	1.48	2.32	2.82	2.22				19.85
7892	Pamlico Chemical Co., Washington, N. C.	Prosperity Cotton Grower	Washington	10.01	.44	1.88	2.32	2.82	2.84				21.18
8290	Richmond Guano Co., Richmond, Va.	Carolina Cotton Grower	Robersonville	**8.38**	.62	1.96	2.58	3.14	2.22				20.05
7913	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Meal Mixture	Lumberton	9.20	.90	1.38	2.28	2.77	2.10				19.48
8096	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Special Tobacco Manure.	Durham	9.95	.76	1.04	**1.80**	2.19	2.75	2.75		3.55	**19.00**
8006	....do	Prolific Cotton Grower	Wilson	9.53	.62	1.50	**2.12**	2.58	2.00				**19.04**
8159	....do	Southern Cotton Grower	Wallace	**8.95**	1.00	1.54	2.54	3.09	2.14				20.31
8075	....do	White Stem	Williamston	9.40	.80	1.36	**2.16**	2.63	**1.96**	1.96		4.05	**19.04**
8084	Young, J. R., Fertilizer Co., Norfolk, Va.	Young's Special Guano	Dunn	**8.72**	1.30	.96	2.26	2.75	2.33				19.22
	Brand claiming			**9.00**			**2.26**	**2.75**	**2.75**				**19.94**
8581	Southern Cotton Oil Co., Fayetteville, N. C.	Goldsboro Cotton Grower	Whitakers	9.49	.66	1.32	**1.98**	2.41	**2.43**				**18.93**
	Brands claiming			**9.00**			**2.47**	**3.00**	**2.00**				**19.93**
8470	Swift Fertilizer Works, Atlanta, Ga.	Swift's Cotton King Guano	Clayton	9.44	1.24	1.34	2.58	3.14	2.35				21.14

7953	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s L. & M. Special.	Raleigh	9.33	2.04	.32	2 36	2.87	1.69					19 46
	Brands claiming			9.00			2 47	3 00	3 00					21 03
8451	Armour Fertilizer Co., Wilmington, N. C.	Armour's African Cotton Grower Fertilizer.	Gibsonville	9.25	1.52	.76	2 28	2 77	4.09					21.71
8092	N. C. Cotton Oil Co., Henderson, N. C.	Pride of Vance Fertilizer	Hester	9.42	1.32	1 24	2.56	3 11	3.46					22 27
8117	Ober, G., & Sons Co., Baltimore, Md.	Ober's Special High Grade Fertilizer.	Red Springs	9.00	1.48	.96	2 44	2 97	3 28					21 22
7944	Patapsco Guano Co., Baltimore, Md.	Patapsco Tobacco Fertilizer	Selma	9.05	1.86	.70	2.56	3 11	2 97	2.97			5.10	21.39
8513	Pocahontas Guano Co., Lynchburg, Va.	Pocahontas Special Tobacco Fertilizer.	Ruffin	9.30	1.86	.82	2 68	3 26	3.21	3.21			5.90	22.35
8498	Scotland Neck Guano Co., Scotland Neck, N. C.	Old Halifax Cotton-seed Meal and Fish Scrap Tob. Guano.	Elm City	8.46	.78	1 46	2 24	2.72	3.80	3.80			8.55	20 53
8352	Southern Cotton Oil Co., Gibson, N. C.	Uncle Sam Fertilizer	Roseboro	9.90	1 08	1 16	2 24	2.72	3.36					23.34
	Brand claiming			9.00			2 47	3 00	6 00					24 35
8461	Reidsville Fertilizer Co., Reidsville, N. C.	Lion Brand Fertilizer	Reidsville	9.76	.82	1 62	2.44	2.97	6 41					25.35
	Brands claiming			9.00			2 88	3.50	5 00					24 83
7856	American Fertilizer Co., Norfolk, Va.	Pitt County Special Fertilizer	Greenville	9.19	1.94	1.02	2 96	3 60	5 26					25 60
8404	Richmond Guano Co., Richmond, Va.	Sander's Special Formula for Bright Tobacco.	Spring Hope	9.32	1.74	1.32	3 06	3 72	4.58	4 58			4.00	25.36
	Brand claiming			9 00			3.29	4 00	4 00					25 37
8292	Scotland Neck Guano Co., Scotland Neck, N. C.	Biggs' Cotton-seed Meal and Fish Scrap Guano.	Robersonville	9.13	1.34	2.02	3.36	4 09	4 20					25 94
	Brand claiming			9.00			4.12	5.00	5 00					29 67
8205	Scotland Neck Guano Co., Scotland Neck, N. C.	Biggs' Truck Guano	Hobgood	9.79	1.62	1.88	3 50	4 26	5 67					28 70
	Brand claiming			9 25			2 06	2 50	2 00					18 56
8233	Patapsco Guano Co., Baltimore, Md.	Patapsco Guano	Franklinton	9.49	1.24	.88	2.12	2.58	1 97					18 97
	Brand claiming			10 00			.82	1.00	3 00					15 50
8398	Canton Fertilizer Co., Canton, Ga.	Quickstep Wheat and Grain Grower.	Murphy	10.95	.50	32	.82	1 00	2 93					16 27
	Brands claiming			10.00			1 65		2 00					17 63
8528	Canton Fertilizer Co., Baltimore, Md.	Orange High Grade Fertilizer	Murphy	9 84	.80	1.06	1.86	2 26	2.80					19 19
8505	Swift's Fertilizer Works, Atlanta, Ga.	Swift's Eagle Guano, High Grade.	Roxboro	10.17	.76	.44	1 20	1 46	1 24					15 20

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brands claiming			10 00			3 30	4 00	4 00				$26 27
8525	Asheville Packing Co., Asheville, N. C.	Extra High Grade Vegetable Special Guano.	Waynesville	8 61	1 48	1 80	3 28	3 99	4 36				25 34
8307	Floradora Guano Co., Laurinburg, N. C.	Humus	Laurinburg	9 84	1.80	1.52	3 32	4 04	4 35				26 59
	Brands claiming			10 00			2 47	3 00	3 00				21 93
8217	Swift Fertilizer Works, Atlanta, Ga.	Swift's Corn and Cotton Grower	Tryon	7.39	.96	.86	1.82	2 21	2 25				16 22
8306	Floradora Guano Co., Laurinburg, N. C.	Rocky Ford	Laurinburg	10.10	1.80	.60	2.40	2.92	7.07				28 23
	Brand claiming			7.00			2.55	3 10	2 20				18 44
8475	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Formula 44	McCullers	7.76	1.66	1.04	2.70	3.28	3 13				20 96
	Brand claiming			7 00			2.47	3 00	3.00				19 23
8012	Farmers Cotton Oil Co., Wilson, N. C.	Farmers' Formula	Wilson	7.78	1 52	1.00	2.52	3 06	3.49				20.67
	Brand claiming			7.00			2.47	3 00	3 25				19 50
8183	Farmers Guano Co., Raleigh, N. C.	Farmers' Formula	Everetts	8.30	1.06	1.46	2.52	3.06	3 36				19 19
	Brands claiming			7 00			3 30	4.00	4 00				23.53
8344	American Fertilizer Co., Norfolk, Va.	American Fish Scrap Guano	Edenton	7.47	2.02	1.20	3 22	3 91	4.54				24 27
8120	....do	....do	Maxton	7.49	2.06	1.18	3.24	3 94	4.44				24.26
	Brands claiming			7.00			3.30	4 00	5.00				24 67
8386	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Southern Leader	Greenville	7.51	2.24	1.06	3.30	4.00	5 73				25.93

7837	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Pasquotank Trucker.	Elizabeth City	7.34	1.78	1.52	3.30	4.00	8.32			28.63
	Brand claiming			**7 00**			**3 30**	**4.00**	**8 00**			**27 97**
7931	Baugh & Sons Co., Norfolk, Va.	Glover's Special Potato Guano	Elizabeth City	7.46	2.50	.98	**3 48**	4.23	**7 97**			27.97
	Brand claiming			**7.00**			**3 70**	**4 50**	**6 00**			**27 39**
8060	Patapsco Guano Co., Baltimore, Md.	Money Maker Guano	Mount Olive	7.29	3.10	1.20	4 30	5.23	**4.81**			**28 62**
	Brands claiming			**7.00**			**4 12**	**5 00**	**5 00**			**27 87**
8258	American Agricultural Chemical Co., New York, N. Y.	Lazaretto Early Trucker	Carthage	7.17	2.88	1.34	4.22	5.13	5 26			28.70
7832	American Fertilizer Co., Norfolk, Va.	American Irish Potato Grower	Elizabeth City	7.17	2.98	1.06	**4.04**	4.91	**4.49**			**27 15**
7879	Pamlico Chemical Co., Washington, N. C.	Pamlico Favorite Potato Guano	Washington	7.60	1.38	2.72	**4 10**	4.98	5 29			28 65
8434	Patapsco Guano Co., Baltimore, Md.	Patapsco Trucker for Early Vegetables.	Henderson	7.93	2.54	1.68	4 22	5.13	5 11			29 21
7998	Pocomoke Guano Co., Norfolk, Va.	Standard Truck Guano	Elizabeth City	7 29	2.88	1.34	4 22	5.13	5 00			28 52
8524	Royster, F. S., Guano Co., Norfolk, Va.	Royal Potato Guano	Rocky Mount	7.03	2.44	1.62	**4 06**	4.94	5.10			27.77
8490	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's Farmer's Favorite Guano.	Elizabeth City	7.62	2.74	1 42	4.16	5.06	6 21			29.90
	Brand claiming			**7 00**			**4 94**	**6 00**	**5 00**			**30 07**
8185	Richmond Guano Co., Richmond, Va.	Special High Grade for Truck	Robersonville	7.10	.98	3 22	**4 20**	5 11	5.09			**28 37**
	Brands claiming			**7 00**			**4 12**	**5 00**	**7 00**			**30 07**
8518	Acme Mfg. Co., Wilmington, N. C.	Acme Root Crop Guano	Mount Olive	7.39	2 40	1.50	**3 90**	4 74	7 22			**29 80**
8305	Craven Chemical Co., New Bern, N. C.	Pantego Potash Guano	Jacksonville	7.22	2 12	1.40	**3 52**	4 28	**6 29**			**27 14**
8030	Navassa Guano Co., Wilmington, N. C.	Navassa Root Crop Fertilizer	Wilmington	9.23	2 30	1 10	**3 40**	4 13	**4 36**			**26 36**
7877	Pamlico Chemical Co., Washington, N. C.	Pamlico Special Irish Potato Guano.	Washington	7.28	1.44	2 68	4 12	5 00	**5 85**			30 15
	Brands claiming			**7.00**			**4 12**	**5 00**	**8 00**			**31 17**
7887	Bragaw Fertilizer Co., Washington, N. C.	Pamlico Trucker	Washington	7.73	1 98	2.26	4.24	5.15	**7 75**			32 02
7898	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Potato Guano	New Bern	7.50	2 30	1 54	**3 84**	4 67	8 94			31 56
7936	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Early Truck Guano	Elizabeth City	7.14	2 90	1 16	4.06	4 94	**7 72**			**30 75**
8158	Union Guano Co., Winston, N. C.	Union Vegetable Compound	Wallace	8 07	1.56	1 48	**3 04**	3 70	**7 13**			**26 96**
8491	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's Special Truck Guano	Elizabeth City	8 50	1 74	1 92	**3 66**	4 45	7 29			**29 94**

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.									
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.										
	Brand claiming			**7 00**			**4.12**	**5 00**	**8 00**				**$31 17**
7837	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Potato Manure.	Hertford	8.32	2 58	.94	3 52	4 28	4 28				28 82
	Brands claiming			**7 00**			**5 76**	**7 00**	**7 00**				**36 46**
8013	Farmers Cotton Oil Co., Wilson, N. C.	Rogers' Truck Grower	Wilson	7.16	2.48	2 98	**5 46**	6 64	**6 58**				**34 98**
7899	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Great Cabbage Guano	New Bern	**8.70**	**4.10**	1.82	5.92	7.20	7.54				37 41
8197	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Truck Guano	Edenton	**6 60**	3 64	.98	**4 62**	5.62	**6 82**				**31 46**
8187	Va.-Car. Chemical Co., Richmond, Va.	Carolina Trucker	Robersonville	7.05	4 98	88	5 86	7.12	7 35				37 28
	Brand claiming			**7.00**			**5 77**	**7.00**	**7 00**				**36 50**
8282	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Dunn's Standard Truck Guano	Richlands	7.42	2 94	2.50	**5 44**	6.61	**8 85**				36 63
	Brand claiming			**6 00**			**1 65**	**2.00**	**2 00**				**14 03**
7873	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Bone and Potash for All Crops.	Elizabeth City	7.95	.98	.70	1.68	2 04	2 10				16 02
	Brand claiming			**6 00**			**3 30**	**4 00**	**4 00**				**22 67**
8127	Royster, F. S., Guano Co., Norfolk, Va.	Oakley's Special Tobacco Guano	Williamston	6.47	1.50	1.86	3.36	4.09	4 00	4.00		10.30	23 33
	Brands claiming			**6.00**			**4 12**	**5 00**	**2 00**				**23 67**
7932	Baugh & Sons Co., Norfolk, Va.	Baugh's 5-6-5 Guano	Elizabeth City	6.29	2.98	1 06	**4.04**	4 91	5.45				24.71
7869	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Early Trucker	New Bern	6.20	2.38	1.32	**3.70**	4.50	4.50				25.38

	Brands claiming			**6.00**			**3.29**	**4.00**	**4.00**				**22.67**
8065	Acme Mfg. Co., Wilmington, N. C.	Acme Truck Grower	Mount Olive	6.20	2.02	1.18	**3.20**	3.89	8.36				27.26
8161	Va.-Car. Chemical Co., Richmond, Va.	Tinsley's Strawberry Grower	Wallace	6.27	2.88	.56	3.44	4.18	5.21				24.79
8242	Young, J. R., Fertilizer Co, Norfolk, Va.	Young's Improved Fish and Bone Manure.	Macclesfield	7.20	2.10	1.28	3.38	4.11	**3.99**				24.05
	Brand claiming			**6.00**			**3.29**	**4.00**	**7.00**				**25.97**
8252	New Bern Cotton Oil and Fertilizer Co., New Bern, N. C.	Eureka Tobacco Fertilizer	Snow Hill	7.92	.74	2.28	**3.02**	3.67	7.97	1.30	6.67	.98	27.67
	Brand claiming			**6.00**			**3.29**	**4.00**	**8.00**				**27.03**
8588	Martin, D. B., Co., Richmond, Va.	Martin's Early Truck and Vegetable Grower.	Lumberton	6.13	3.14	.48	3.62	4.40	8.84				29.36
	Brands claiming			**6.00**			**4.12**	**5.00**	**5.00**				**26.97**
8342	Imperial Co., Norfolk, Va.	Williams' Special Potato Guano.	Elizabeth City	6.99	2.38	1.84	4.22	5.13	**4.92**				28.16
8135	Young, J. R., Fertilizer Co., Norfolk, Va.	Young's Special Guano for Potatoes.	Elizabeth City	6.00	2.60	1.50	4.10	4.98	5.27				27.19
	Brands claiming			**6.00**			**4.12**	**5.00**	**7.00**				**29.17**
7831	American Fertilizer Co., Norfolk, Va.	Special Potato Manure	Elizabeth City	6.25	3.18	.76	**3.94**	4.79	**8.41**				**28.04**
7929	Baugh & Sons Co., Norfolk, Va.	Baugh's Peruvian Guano Sub. for Potatoes, etc.	Elizabeth City	6.54	3.20	.94	4.14	5.03	**6.96**				29.69
7933	Eastern Cotton Oil Co., Hertford, N. C.	None-Such Potato Grower	Elizabeth City	6.45	2.20	1.86	**4.06**	4.94	7.67				30.07
7897	Martin, D. B., Co., Richmond, Va.	Martin's Animal Bone Potato Guano.	New Bern	**5.15**	4.32	.40	4.72	5.74	9.47				33.46
8216	Patapsco Guano Co., Baltimore, Md.	Patapsco Potato Guano	Brevard	6.70	3.72	.56	4.28	5.20	7.02				30.44
7934	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Early Vegetable Manure.	Elizabeth City	6.50	2.86	1.22	**4.08**	4.96	**6.84**				29.29
8291	Swift Fertilizer Co., Wilmington, N. C.	Swift's High Grade Special Potato Grower.	Robersonville	7.72	1.64	2.00	**3.64**	4.43	**6.70**				**26.51**
7937	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Invincible High Grade Fertilizer for Trucks.	Elizabeth City	6.47	2.84	.98	**3.82**	4.64	7.68				29.17
	Brands claiming			**6.00**			**4.94**	**6.00**	**7.00**				**32.37**
8299	Imperial Co., Norfolk, Va.	Asparagus Mixture	Conetoe	6.04	3.32	1.56	**4.88**	5.93	7.39				32.60
7868	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Special Potato Guano.		6.32	3.12	1.62	4.74	5.76	8.05				33.03
	Brands claiming			**6.00**			**5.76**	**7.00**	**5.00**				**33.35**
7928	Baugh & Sons Co., Norfolk, Va.	Baugh's 7 Per Cent Potato Guano.	Elizabeth City	6.13	4.76	1.12	5.88	7.15	5.80				38.43
7865	Eastern Cotton Oil Co., Hertford, N. C.	Hertford Truck Grower	Hertford	6.92	2.40	2.88	**5.28**	6.42	5.61				**32.98**

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.									Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	
				MIXED FERTILIZERS.									
	Brands claiming			**8.00**			**5.76**	**7.00**	**5.00**				**$33.35**
7867	Martin, D. B., Co., Richmond, Va.	Martin's 7 Per Cent Truck Fertilizer.	Edenton	6.87	5.14	.36	5.50	6.69	**4.05**				**32.09**
8182	Roberson, J. H., & Co., Robersonville, N. C.	Roberson's Potato Grower	Robersonville	**5.51**	3.26	2.16	**5.42**	6.59	5.51				**32.16**
8137	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 7 Per Cent Irish Potato Guano.	Elizabeth City	8.77	3.84	1.38	5.22	6.35	5.46				34.26
	Brand claiming			**6.40**			**2.13**	**2.80**	**3.00**				**17.37**
8149	Floradora Guano Co., Laurinburg, N. C.	Scotland Special	Laurinburg	7.59	.26	1.89	**2.06**	2.50	3.94				19.20
	Brand claiming			**5.00**			**1.65**	**2.00**	**6.00**				**17.53**
8241	Royster, F. S., Guano Co., Norfolk, Va.	Phillips' Special	Pinetop	5.45	.88	.90	1.78	2.16	6.24				18.71
	Brands claiming			**5.00**			**5.76**	**7.00**	**5.00**				**32.46**
8203	Imperial Co., Norfolk, Va.	Special 7 Per Cent for Potatoes	Hobgood	5.78	4.30	1.52	5.82	7.08	5.12				33.53
8334	Lister's Agricultural Chemical Works, New York, N. Y.	Lister's Special 7 Per Cent Potato Guano.	Edenton	5.79	4.38	1.50	5.88	7.15	5.07				33.72
	Brand claiming			**5.00**			**8.23**	**10.00**	**2.50**				**39.35**
8298	Imperial Co., Norfolk, Va.	Imperial 10 Per Cent Guano	Conetoe	5.54	5.52	2.36	**7.88**	9.59	2.74				**38.73**
	Brand claiming			**5.50**			**1.23**	**1.50**	**5.50**				**15.80**
8449	Scotland Neck Guano Co., Scotland Neck, N. C.	Our Best Peanut Guano	Scotland Neck	5.86	.16	1.16	1.32	1.61	5.70				16.69
	Brand claiming			**4.00**			**3.29**	**4.00**	**6.00**				**23.03**
8286	Young, J. R., Fertilizer Co., Norfolk, Va.	Young's Special Tobacco Fertilizer.	La Grange	**3.93**	2.16	.98	**3.14**	3.82	**5.53**	5.53		7.72	**21.86**

	Brand claiming			**4 00**			**3.29**	**4.00**	**4 00**		**20 83**
8138	Imperial Co., Norfolk, Va.	Conetoe Cotton Grower	Elizabeth City	5.22	2.20	1.10	3 30	4.01	**3 53**		21 45
	Brand claiming			**3 00**			**8.25**	**10.03**	**4 00**		**39 26**
8374	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Top Dresser	Morrisville	3.44	5.92	1.50	**7 42**	9.02	4.96		37 49
	Brand claiming			**2.00**			**8 23**	**10.00**	**5.00**		**39 39**
8496	Farmers Cotton Oil Co., Wilson, N. C.	Wilson's Perfect Top Dresser	Nashville	2.57	6.04	1 20	**7.24**	8 80	5.41		36.50
	Brand claiming			**3.50**			**8.64**	**10 50**			**36 85**
8243	Royster, F. S., Guano Co., Norfolk, Va.	Dry Fish	Pinetop	5.70	2 24	6.42	8.66	10.53			38 90
	Brand claiming			**4 00**			**8 64**	**10.50**			**37 26**
8362	Royster, F. S., Guano Co., Norfolk, Va.	Dry Fish	Cameron	4 12	1.10	7.48	**8.58**	10.43			37 17
	Brand claiming			**5 50**			**7.82**	**9.51**			**35 45**
8417	Pamlico Chemical Co., Washington, N. C.	Acidulated Fish Scrap	Washington	**5.09**	4.06	3.98	8.04	9.78			35 94
	Brand claiming			**2.00**			**8.23**	**10.00**			**33.90**
8570	Coe-Mortimer Co., Charleston, S. C.	High Grade Tankage	Benson	4 32	1.66	7.28	8.94	10.87			38.75
	Brands claiming						**7.41**	**9 00**	**3 00**		**32 20**
8592	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Boykin's Top Dresser	Maxton				**6 14**	7.47	3.56		**27 86**
8265	Home Fertilizer and Chemical Co., Baltimore, Md.	Cerealite Top Dresser	Troy				7.44		3 68		33.05
	Brand claiming			**7.00**					**5 00**		**11 80**
8346	Columbia Guano Co., Norfolk, Va.	Crown Brand Peanut Guano	Edenton	**7.21**					**4 68**		**11 64**
	Brands claiming			**8.00**					**4 00**		**11 60**
8055	Columbia Guano Co., Norfolk, Va.	Columbia 8-4 Bone and Potash	Greensboro	**7.59**					**3.47**		**10 65**
8571	Powhatan Chemical Co., Richmond, Va.	Powhatan Bone and Potash	Benson	9 23					4 23		12 96
8463	Reidsville Fertilizer Co., Reidsville, N. C.	Bone and Potash	Reidsville	9 02					**3 90**		12.41
8382	Swift Fertilizer Works, Atlanta, Ga.	Swift's Standard Grade Plantation Phosphate and Potash.	Winston	9.54					**2 91**		11 79
8576	Union Guano Co., Winston, N. C.	Union Wheat Mixture	North Wilkesboro	10.12					**2 85**		12 24
8270	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Carr's Special Wheat Grower.	Charlotte	9.78					**3 09**		12 20

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
			MIXED FERTILIZERS.										
	Brand claiming			**8.00**					**4 00**				**$11 60**
8462	Va.-Car. Chemical Co., Richmond, Va.	Travers' Special Wheat Compound.	Brown Summit	9.68					**3 25**				12 29
	Brand claiming			**8.00**					**5 00**				**12 70**
8478	Union Guano Co., Winston, N. C.	Union Bone and Potash	McCullers	9.46					**4 23**				13 17
	Brand claiming			**9 00**					**4 00**				**12 50**
8578	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Bone and Potash Fertilizer.	Greensboro	**8 89**					4.42				12.86
	Brands claiming			**10 00**					**2.00**				**11 20**
8389	American Fertilizer Co., Norfolk, Va.	Dissolved Bone and Potash for Corn and Wheat.	Edenton	10 02					2.09				11 32
8598	Armour Fertilizer Works, Wilmington, N. C.	Phosphate and Potash, No. 1	Dunn	10 37					**1 82**				11 33
8338	Arps, Geo. L., & Co., Norfolk, Va.	Arps' Bone and Potash Mixture	Edenton	**9 91**					2 16				11.29
8388	Berkley Chemical Co., Norfolk, Va.	Laurel Potash Mixture	Edenton	10.02					2 08				11 31
8597	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Electric Bone and Potash Mixture.	Dunn	**9 13**					2.39				**10 84**
8066	Columbia Guano Co., Norfolk, Va.	Columbia Bone and Potash Mixture.	Bowden	10.37					2 21				11.76
8445	Craven Chemical Co., New Bern, N. C.	Trent Bone and Potash	Jacksonville	10 32					2 06				11.55
7977	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Bone and Potash	New Bern	10.30					2 07				11 55
8493	Imperial Co., Norfolk, Va.	Bone and Potash	Edenton	10.09					2 05				11 33
8577	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Corn Fertilizer	Greensboro	10.69					**1.75**				11 54

8144	Miller Fertilizer Co., Baltimore, Md.	Clinch Phosphate	Edenton	10.75		2.07	11.95
8425	Southern Cotton Oil Co., Shelby, N. C.	Magnolia Bone and Potash	Shelby	8.72		2.93	11.07
8561	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.	Spencer	10.39		2.14	11 70
8257	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Carteret Bone and Potash	New Bern	11.97		2.28	13 28
8438	Patapsco Guano Co., Baltimore, Md.	Patapsco Soluble Bone and Potash.	Henderson	10.09		2.13	11 42
8048	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture	Winston	9.97		2 32	11 52
8595	Richmond Guano Co., Richmond, Va.	Bone and Potash Mixture	Dunn	10.50		2 02	11 67
8394	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture.	Durham	10.37		2 01	11 54
8381	Swift Fertilizer Works, Atlanta, Ga.	Standard Grade Field and Farm	Winston	10.08		1 79	11 04
8494	Union Abattoir Co., Norfolk, Va.	Red Star Brand Potash and Soluble Bone.	South Mills	11.84		2.87	13 81
8214	Union Guano Co., Winston, N. C.	Union Bone and Potash	Statesville	10 29		2 06	11.53
8300	Va.-Car. Chemical Co., Norfolk, Va.	Allison & Addison's B. P. Potash Mixture.	Conetoe	10.47		2 84	12 55
8517	----do	Davie & Whittle's Owl Brand Acid Phosphate with Potash.	Semora	9 95		1 99	11 14
8097	----do	Durham Fertilizer Co.'s Bone and Potash Mixture.	Durham	10.35		3.04	12 66
8057	----do	Old Dominion Guano Co.'s Alkaline Bone and Potash.	Winston	9 47		1 52	13 49
8081	----do	Southern Chemical Co.'s Mammoth Corn Grower.	Salisbury	10 20		1 75	11 10
7986	----do	Travers & Co.'s Bone and Potash Compound.	Durham	10 73		1 90	11 02
8287	----do	V.-C. C. Co.'s Dissolved Bone and Potash.	Richlands	9 89		2 61	11 77
	Brand claiming			10.00		3 00	12 30
8484	Union Guano Co., Winston, N. C.	Finch & Harris' Special Bone and Potash Mixture.	Thomasville	10 40		3 09	12.76
	Brands claiming			10 00		4 00	13 40
8410	Acme Mfg. Co., Wilmington, N. C.	Acme Bone and Potash	Roseboro	10 30		3 84	13 49
8541	American Fertilizer Co., Norfolk, Va.	Double Dissolved Bone and Potash.	Edenton	10.22		4 55	14 20
8529	Asheville Packing Co., Asheville, N. C.	Superior Potato Fertilizer	Waynesville	9 81		5 68	15 08
8339	Berkley Chemical Co., Norfolk, Va.	Berkley Plant Food	Edenton	10.42		3 97	13 74
8596	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special Bone and Potash Mixture.	Dunn	8 08		4 90	12 66

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	MIXED FERTILIZERS.												
	Brands claiming			**10 00**					**4 00**				**$13 40**
8250	Columbia Guano Co., Norfolk, Va.	Columbia 10-4 Bone and Potash Mixture.	Mooresville	10 00					**3 68**				**13 05**
8607	----do	----do	Edenton	**9.64**					**3 83**				**12 89**
8567	Hampton Guano Co., Norfolk, Va.	Hampton Crop Grower	Pine Level	10.59					**3.80**				13 71
7976	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Special Mixture	New Bern	10.47					**4 85**				14.76
8601	Miller Fertilizer Co., Baltimore, Md.	Miller Fertilizer Co.'s 10-4	Lexington	10.55					4.48				14.42
8098	Navassa Guano Co., Wilmington, N. C.	Navassa Wheat and Grass Grower.	Lucama	10.54					**3 82**				13 69
8384	Pearsall & Co., Wilmington, N. C.	Pearsall's Ground Bone and Potash Special.	Manchester	11.16					**3 65**				14 05
8049	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Bone and Potash Mixture.	Winston	10 12					**3 85**				13 34
8594	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture	Dunn	10.36					**3 92**				13 64
8347	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 10-4 Bone and Potash Mixture.	Edenton	10 40					**3 52**				**13 23**
8215	Union Guano Co., Winston, N. C.	Quaker Grain Mixture	High Point	10.54					**3 59**				13 43
8562	Swift Fertilizer Works, Atlanta, Ga.	Swift's High Grade Farmers' Home Phosphate and Potash.	China Grove	11.19					**3.15**				13.53
8056	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Obelisk Bone and Potash.	Winston	**8.54**					4 68				**12 83**
8563	----do	Southern Chemical Co.'s Winner Grain Mixture.	Salisbury	10.20					**3 71**				**13.26**
7969	----do	V.-C. C. Co.'s Special Potash Mixture.	Raleigh	10 69					**3.78**				13.79

	Brands claiming			**10.00**		**5.00**	**14 50**
8566	Columbia Guano Co., Norfolk, Va.	Columbia 10-5 Bone and Potash Mixture.	Selma	**9.94**		**4.54**	**13 94**
8375	Va.-Car. Chemical Co., Richmond, Va.	Lynchburg Guano Co.'s Alpine Mixture.	Youngsville	10.31		5 79	15 65
	Brands claiming			**11.00**		**5 00**	**15.40**
8357	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Horne & Son's High Grade Bone and Potash.		11.50		5.15	16.01
8507	Patapsco Guano Co., Baltimore, Md.	High Grade Phosphate and Potash.	Roxboro	11.77		4 39	15 42
8506	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 11-5 Bone and Potash.	Roxboro	11.01		4.16	14 48
7968	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Quick-step Bone and Potash.	Raleigh	11.78		4 37	15 41
	Brand claiming			**12.00**		**6.00**	**17 40**
8481	Union Guano Co., Winston, N. C.	Union 12-6 Bone and Potash		12.20		6.32	17.93

Raw or Unmixed Fertilizer Materials.

	Brands claiming			**12.00**			**9 60**
8664	Richmond Guano Co., Richmond, Va.	Old Homestead Dissolved Bone	Mocksville	**11 00**			**8 80**
8383	Swift Fertilizer Works, Atlanta, Ga.	Swift's Chattahoochee Standard Grade Acid Phosphate.	Winston-Salem	13 33			10 66
8603	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Durham Acid Phosphate.	Mocksville	14 34			11 47
8426	----do	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Henrietta	12.45			9 96
8054	----do	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Winston-Salem	12.10			9.68
	Brands claiming			**13 00**			10 40
8211	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Sterling Acid Phosphate	Lexington	**11.60**			**9 28**
8212	Farmers Guano Co., Raleigh, N. C.	Farmers' Acid Phosphate	Lexington	14.21			11 37
8602	Richmond Guano Co., Richmond, Va.	Premium Dissolved Bone	Mocksville	13.31			10.65
8485	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Lexington	**12 44**			**9 95**
8219	Swift Fertilizer Works, Atlanta, Ga.	Swift's Harrow High Grade Acid Phosphate.	Tryon	15 70			12 56
8564	Union Guano Co., Winston, N. C.	Union Dissolved Bone	Salisbury	13 12			10 50

ANALYSES OF COMMERCIAL FERTILIZERS. SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brands claiming			**13 00**									**$10 40**
8213	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s I X L Acid Phosphate.	Lexington	**12 82**									**10 26**
8467	....do	Davie & Whittle's Owl Brand Acid Phosphate.	Rutherfordton	13.28									10 62
7957	....do	Durham Fertilizer Co.'s Double Bone Phos., Extra Strong.	Raleigh	13.73									10.80
8210	....do	Old Dominion Guano Co.'s Bone and Phosphate.	Mocksville	**12 78**									**10.22**
	Brands claiming			**14 00**									**11.20**
8068	Acme Mfg. Co., Wilmington, N. C.	Acme High Grade Acid Phosphate.	Mount Olive	14.54									11.63
8073	American Chemical Co., New York, N. Y.	Lazaretto Dissolved Acid Phosphate.	Williamston	14 39									11.51
8005	American Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate	Elizabeth City	**13 87**									**11 10**
8113	Arps, Geo. L., & Co., Norfolk, Va.	14 Per Cent Acid Phosphate	Edenton	**13 82**									**11 06**
8608	Baltimore Fertilizer Co., Baltimore, Md.	Honest Acid Phosphate	Nixonton	**12 66**									**10 13**
8001	Baugh & Sons, Philadelphia, Pa.	Baugh's High Grade Acid Phosphate.	Elizabeth City	14.35									11 48
8395	Berkley Chemical Co., Norfolk, Va.	Berkley Acid Phosphate	Chapel Hill	14.26									11 41
8024	Bragaw Fertilizer Co., Washington, N. C.	Palmetto Phosphate	Washington	14.15									11.32
8530	Canton Fertilizer Co., Canton, Ga.	C. F. C. High Grade Dissolved Bone.	Murphy	14.02									11.22
8124	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Climax Dissolved Bone	Red Springs	**12 97**									**10 38**
8301	Columbia Guano Co., Norfolk, Va.	Columbia Acid Phosphate	Bethel	14.06									11.25

8371	Craven Chemical Co., New Bern, N. C.	Jewel Acid Phosphate	Pollocksville	14.98								11.98
8557	Hampton Guano Co., Norfolk, Va.	Hampton's Acid Phosphate	Jackson	14.60								11.68
8199	Harrell, S. B., & Co., Norfolk, Va.	Harrell's Acid Phosphate	Edenton	14.12								11.30
8591	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's 14 Per Cent Phosphate.	Maysville	**13.33**								**10.68**
7978	do	Hubbard's 14 Per Cent Soluble Bone.	New Bern	14.76								11.81
8343	Imperial Co., Norfolk, Va.	High Grade Acid Phosphate	Elizabeth City	14.39								**11.51**
8419	Lee, A. S., & Sons Co., Richmond, Va.	Lee's 14 Per Cent Acid Phosphate.	Washington	**11.35**								**9.08**
8227	Martin, D. B., Co., Richmond, Va.	Martin's Acid Phosphate	Washington	14.07								11.26
8143	Miller Fertilizer Works, Baltimore, Md.	Acid Phosphate	Edenton	14.27								11.42
8037	Navassa Guano Co., Wilmington, N. C.	Navassa 14 Per Cent Acid Phosphate.	Wilmington	14.19								11.35
7965	Pamlico Chemical Co., Washington, N. C.	Pamlico Bone Phosphate	Washington	14.07								11.26
8277	Pearsall & Co., Wilmington, N. C.	Pearsall's 14 Per Cent Acid Phosphate.	Burgaw	14.52								11.62
7871	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont High Grade S. C. Bone.	Hertford	**13.98**								**11.18**
8361	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' High Grade Acid Phosphate.	Swann	**13.59**								**10.87**
8003	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate	Elizabeth City	14.33								11.47
8439	Powhatan Chemical Co., Richmond, Va.	High Grade Acid Phosphate	Henderson	14.41								11.53
8267	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 14 Per Cent Acid Phosphate.	Troy	14.19								11.35
8370	Southern Cotton Oil Co., Goldsboro, N. C.	S. C. O. Co.'s Acid Phosphate	Murray	14.44								11.55
7922	Southern Exchange Co., Maxton, N. C.	S. E. Co.'s Acid Phosphate	Lumberton	14.42								11.54
8278	Swift Fertilizer Works, Wilmington, N. C.	Swift's Cultivator High Grade Acid Phosphate.	Burgaw	15.07								12.06
8348	Union Abattoir Co., Norfolk, Va.	Union Abattoir Acid Phosphate	Mackey's Ferry	16.46								13.17
4040	Union Guano Co., Winston, N. C.	Union High Grade Acid Phosphate.	Lexington	16.77								13.42
8268	do	do	Star	14.30								11.44
8580	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Fulton Acid Phosphate.	Greensboro	14.94								11.95
7956	do	Durham Fertilizer Co.'s Dissolved Bone and Potash.	Raleigh	14.87								11.90

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brands claiming			**14.00**									**$11.20**
8271	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s High Grade Acid Phosphate.	Charlotte	14.95									11.96
8083	....do	Southern Chemical Co.'s Red Cross Acid Phosphate.	Salisbury	14.99									11.99
8141	....do	S. W. Travers' Dissolved Bone Phosphate.	Edenton	**13.78**									**11.02**
8002	....do	Va.-Car. Chemical Co.'s Acid Phosphate.	Elizabeth City	14.05									11.24
3769	....do	S. W. Travers' Dissolved Bone Phosphate.	Everetts	14.26									11.41
3931	....do	Va.-Car. Chemical Co.'s 14 Per Cent Acid Phosphate.	Enfield	15.89									12.71
	Brands claiming			**16.00**									**12.80**
8121	Acme Mfg. Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	Red Springs	16.49									13.19
8544	Agricultural Chemical Co., New York, N. Y.	....do	Edenton	16.88									13.50
8418	American Fertilizer Co., Norfolk, Va.	American High Grade Acid Phosphate.	Greenville	16.09									12.87
8139	Baugh & Sons Co., Norfolk, Va.	Baugh's 16 Per Cent Acid Phosphate.	Edenton	16.52									13.06
8495	Berkley Chemical Co., Norfolk, Va.	Resolute Acid Phosphate	Edenton	**15.96**									**12.77**
8531	Canton Fertilizer Co., Canton, Ga.	C. F. C. High Grade Dissolved Bone.	Murphy	16.04									12.83
7971	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	16 Per Cent Acid Phosphate	Raleigh	**15.31**									**12.25**
8377	Clayton Oil Mill, Clayton, N. C.	C. O. M. 16 Per Cent Acid Phosphate.	Wake Forest	**15.31**									**12.25**
8067	Columbia Guano Co., Norfolk, Va.	Columbia High Grade 16 Per Cent Acid Phosphate.	Bowden	**15.75**									**12.60**

8411	Craven Chemical Co., New Bern, N. C.	Panama 16 Per Cent Acid Phosphate.	Clinton	**15.89**							**12 71**
7870	Eastern Cotton Oil Co., Hertford, N. C.	Acid Phosphate	Hertford	**15 99**							**12.79**
8112	----do	16 Per Cent Acid Phosphate	Chapanoke	16.01							12 81
8354	Farmers Guano Co., Raleigh, N. C.	Acid Phosphate	Roseboro	**15.17**							**12 14**
8111	Hampton Guano Co., Norfolk, Va.	Supreme Acid Phosphate	Edenton	16.03							12 82
7841	Hubbard, M. P., & Co., Baltimore, Md.	Hubbard's 16 Per Cent Acid Phosphate.	Edenton	16.42							13 14
8070	Hubbard Fertilizer Co., Baltimore, Md.	----do	Williamston	16.00							12 80
3764	Imperial Co., Norfolk, Va.	High Grade Tennessee Acid Phosphate.	Speed	16.17							12 94
7992	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	16 Per Cent Acid Phosphate	Goldsboro	16.56							13 35
8266	Norfolk Fertilizer Co., Norfolk, Va.	Oriana 16 Per Cent Acid Phosphate.	Mount Gilead	**15.67**							**12 54**
8171	Navassa Guano Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	Chadbourn	16.62							13 30
3926	----do	Navassa Acid Phosphate	Fayetteville	**15.88**							12.70
8228	Pamlico Chemical Co., Washington, N. C.	Pamlico 16 Per Cent Acid Phosphate.	Washington	16.64							13.31
8474	Patapsco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Lucama	16.37							13.10
8200	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate.	Edenton	**15 75**							**12 60**
8336	Pocomoke Guano Co., Norfolk, Va.	Superior Acid Phosphate, 16 Per Cent.	Elizabeth City	**15.79**							**12 63**
8440	Powhatan Chemical Co., Richmond, Va.	Magic Dissolved Bone Potash	Henderson	16 57							13.26
8236	Ober, G., & Sons Co., Baltimore, Md.	Ober's High Grade Acid Phosphate.	Louisburg	16.98							13.58
7959	Raisin-Monumental Co., Baltimore, Md.	Raisin's 16 Per Cent Acid Phosphate.	Raleigh	16.26							13 01
8545	Robertson Fertilizer Co., Norfolk, Va.	High Peak Acid Phosphate	Edenton	16.50							13 20
8104	Royster, F. S., Guano Co., Norfolk, Va.	Royster's High Grade 16 Per Cent Acid Phosphate.	Smithfield	**15 94**							**12 75**
8579	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone Phosphate	North Wilkesboro	16.22							12 98
7855	Swift Fertilizer Works, Atlanta, Ga.	Swift's Special High Grade Acid Phosphate.	Maxton	16.16							12 93
8251	Union Guano Co., Winston-Salem, N. C.	Union Guano Co.'s 16 Per Cent Acid Phosphate.	Pineville	16 69							13 35
8399	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand High Grade Acid Phosphate.	Andrews	**15.79**							**12 63**
8082	----do	Durham Fertilizer Co.'s Durham Best Acid Phosphate.	Concord	16.23							12 98

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brands claiming			**16 00**									**$12 80**
8428	Va.-Car. Chemical Co., Richmond, Va.	Southern Chem. Co.'s Comet 16 Per Cent Acid Phosphate.	Bonsal	16.44									13 15
8466	do	S. W. Travers & Co.'s Champion Acid Phosphate.	Brown Summit	16.24									12 99
7958	do	V.-C. C. Co.'s 16 Per Cent Acid Phosphate.	Raleigh	16.76									13 41
3937	Winborne Guano Co., Norfolk, Va.	Winborne's Standard 16 Per Cent Acid Phosphate.	Edenton	16.24									12 99
8110	Young, J. R., Fertilizer Co., Norfolk, Va.	High Grade 16 Per Cent Acid Phosphate.	Edenton	16.22									12 98
	Brands claiming								**12 00**				**12 00**
8412	Acme Mfg. Co., Wilmington, N. C.	Pure German Kainit	Roseboro						12.60				12 60
7840	American Agricultural Chemical Co., New York, N. Y.	Genuine German Kainit	Edenton						13.22				13 22
8000	American Fertilizer Co., Norfolk, Va.	do	Elizabeth City						12.68				12 68
8116	Arps, G. L., & Co., Norfolk, Va.	do	Edenton						12.40				12 40
8322	Parsons & Hardison, Wilkesboro, N. C.	do	Wadesboro						13.46				13 46
8034	Baugh & Sons Co., Philadelphia, Pa.	do	Wilmington						12.84				12 84
8568	Best, M. J., & Sons, Goldsboro, N. C.	do	Goldsboro						13.04				13 04
7973	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	do	Raleigh						13 08				13.08
8454	Coe-Mortimer Co., Charleston, S. C.	do	Greensboro						12.58				12 58
8302	Columbia Guano Co., Norfolk, Va.	do	Bethel						13 10				13 10

7952	Craven Chemical Co., New Bern, N. C.	....do	New Bern	12.94		12 94
7872	Eastern Cotton Oil Co., Hertford, N. C.	....do	Hertford	12.22		12 22
8115	....do	....do	Chapanoke	12.66		12.66
8015	Hadley, Harris & Co., Wilson, N. C.	....do	Wilson	13.52		13 52
8337	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Pure German Kainit	Edenton	12.18		12 18
8303	Imperial Co., Norfolk, Va.	Genuine German Kainit	Conetoe	12.50		12 50
7927	Martin, D. B., Co., Baltimore, Md.	....do	Lumberton	13.04		13 04
8152	McNair, John F., Laurinburg, N. C.	....do	Laurinburg	12.64		12 64
3925	....do	....do	Fayetteville	12.50		12 50
8391	Meadows, E. H. & J. A., Co., New Bern, N. C.	German Kainit	House	12.12		12.12
8142	Miller Fertilizer Co., Baltimore, Md.	....do	Edenton	12.80		12.80
8035	Navassa Guano Co., Wilmington, N. C.	Genuine German Kainit	Wilmington	12.22		12 22
8590	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	....do	Maysville	14 28		14 28
8237	Ober, G., & Sons Co., Baltimore, Md.	....do	Louisburg	12.86		12 86
8023	Pamlico Chemical Co., Washington, N. C.	....do	Washington	13.22		13 22
7925	Pearsall & Co., Wilmington, N. C.	....do	Lumberton	12 86		12 86
8133	Peruvian Guano Corporation, Charleston, S. C.	....do	Williamston	12.36		12 36
8201	Piedmont-Mount Airy Guano Co., Baltimore, Md.	....do	Edenton	**11 72**		**11 72**
8121	Powhatan Chemical Co., Richmond, Va.	Pure German Kainit	Greenville	12.60		12 60
8556	Roberson Guano Co., Norfolk, Va.	Genuine German Kainit	Seaboard	**11 94**		**11 94**
7863	Royster, F. S., Guano Co., Norfolk, Va.	....do	Greenville	12 78		12 78
3929	....do	....do	Norfleet	12.64		12 64
8351	Southern Cotton Oil Co., Gibson, N. C.	....do	Red Springs	13.10		13 10
7923	Southern Exchange Co., Maxton, N. C.	....do	Lumberton	12.06		12 06
8173	Swift Fertilizer Works, Wilmington, N. C.	....do	Chadbourn	**11.78**		**11 78**
8546	Union Abattoir Co., Baltimore, Md.	....do	Gliden	12 40		12 40

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brands claiming								12 00				$12 00
8279	Union Guano Co., Winston-Salem, N. C.	Genuine German Kainit	Warsaw						12.44				12 44
8001	Va.-Car. Chemical Co., Richmond, Va.	do	Elizabeth City						12 50				12 50
8349	Winborne Guano Co., Norfolk, Va.	Winborne's Genuine German Kainit.	Edenton						12 88				12 88
3933	do	do	Edenton						11 02				11 02
8114	Young, J. R., Fertilizer Co., Norfolk, Va.	Genuine German Kainit	Edenton						12 36				12.36
	Brand claiming								16 00				16 00
8521	Acme Mfg. Co., Wilmington, N. C.	High Grade German Kainit	Mount Olive						17 24				17.24
	Brands claiming								48 00				48 00
8122	Acme Mfg. Co., Wilmington, N. C.	Muriate of Potash	Red Springs						46.55				46 55
8363	Baugh & Sons Co., Philadelphia, Pa.	do	Gulf						49 80				49 80
8589	Conestee Chemical Co., Wilmington, N. C.	Sulphate of Potash	Lumberton						49.11				49 11
8162	Cooper, W. B., Wilmington, N. C.	Muriate of Potash	Wallace						45.98				45 98
8450	German Kali Works, Baltimore, Md.	do	Scotland Neck						48.69				48 69
7993	do	Sulphate of Potash	Goldsboro						50.51				50.51
8194	Navassa Guano Co., Wilmington, N. C.	Muriate of Potash	Fayetteville						49.15				49.15
8443	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	do	Jacksonville						52.04				52.04

7926	Pearsall & Co., Wilmington, N. C.	Sulphate of Potash	Lumberton				47 99		**47 99**
8499	Richmond Guano Co., Richmond, Va.	do	Nashville				48 73		48 73
8522	Royster, F. S., Guano Co., Norfolk, Va.	Muriate of Potash	Mount Olive				50 08		50 08
8520	Va.-Car. Chemical Co., Richmond, Va.	do	Mount Olive				48 49		48 49
	Brands claiming						**49 00**		**49 00**
8038	Calder Bros., Wilmington, N. C.	Muriate of Potash	Wilmington				**47 87**		**47 87**
8321	Coe-Mortimer Co., Charleston, S. C.	do	Gastonia				55 40		55 40
7854	do	do	Maxton				50 78		50 78
8153	McNair, John F., Laurinburg, N. C.	do	Laurinburg				49 34		49 34
8036	Navassa Guano Co., Wilmington, N. C.	do	Wilmington				50 20		50 20
7924	Pearsall & Co., Wilmington, N. C.	do	Lumberton				**47 68**		**47 68**
8022	Peruvian Guano Corporation, Charleston, S. C.	do	Edenton				50 54		50 54
8280	Pocomoke Guano Co., Norfolk, Va.	do	Clinton				**48 73**		**48 73**
8584	Union Guano Co., Winston-Salem, N. C.	do	Battleboro				50 45		50 45
8080	Va.-Car. Chemical Co., Richmond, Va.	do	Concord				49 67		49 67
8206	do	do	Palmyra				49 13		49 13
	Brands claiming						**50 00**		**50 00**
7972	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Muriate of Potash	Raleigh				51 05		51 05
8071	German Kali Works, Baltimore, Md.	do	Williamston				**46 23**		**46 23**
8609	Pamlico Chemical Co., Washington, N. C.	do	Washington				**48 33**		**48 33**
8500	Richmond Guano Co., Richmond, Va.	do	Nashville				**49 39**		**49 39**
	Brands claiming					**14 81**	**18 00**		**53 32**
8123	Acme Mfg. Co., Wilmington, N. C.	Nitrate of Soda	Red Springs			15 08	18 33		54 28
8542	American Fertilizer Co., Norfolk, Va.	do	Edenton			**14 44**	17 56		**51 98**
8444	Armour Fertilizer Works, Wilmington, N. C.	do	Garland			15 44	18 77		55 58
8033	Coe-Mortimer Co., Charleston, S. C.	do	Wilmington			15 40	18 72		55 44

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1910.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. *Total Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brands claiming						**14 81**	**18 00**					**$53 32**
8163	Cooper, W. B., Wilmington, N. C.	Nitrate of Soda	Wallace				15 16	18 43					54 58
3772	Grace, W. R., & Co., Wilmington, N. C.	do	Washington				15.36	18 67					55 30
8169	Navassa Guano Co., Wilmington, N. C.	do	Chadbourn				15 08	18.33					54 29
8390	Nitrate Agency Co., Norfolk, Va.	do	Edenton				**14 40**	17.51					**51.84**
8582	Richmond Guano Co., Richmond, Va.	do	Scotland Neck				15.20	18 48					54 72
8385	Swift's Fertilizer Works, Wilmington, N. C.	do	Manchester				15.40	18.72					55.44
8583	Union Guano Co., Winston, N. C.	do	Battleboro				15 44	18.77					55 58
8140	Va.-Car. Chemical Co., Richmond, Va.	do	Edenton				14.96	18.19					53.86
7987	do	do	Durham				15.72	19.11					56.59
	Brand claiming						**15 00**	**18 23**					**54 00**
8170	Pocomoke Guano Co., Norfolk, Va.	Nitrate of Soda	Wilmington				**14 82**	18.02					**53 35**
	Brands claiming						**15 22**	**18.50**					**54 79**
8345	Arps, G. L., & Co., Norfolk, Va.	Nitrate of Soda	Edenton				15.40	18.72					55.44
8364	Baugh & Sons Co., Norfolk, Va.	do	Gulf				**15 00**	18.24					**54 00**
8198	Eastern Cotton Oil Co., Hertford, N. C.	do	Edenton				15.44	18.77					55 58
8319	Robertson Fertilizer Co., Norfolk, Va.	do	Kings Mountain				**14.76**	17.95					53.14

8376	Royster, F. S., Guano Co., Norfolk, Va.	....do	Wake Forest			15.64	19.02			56.30
3770	Upshur, R. L., Guano Co., Norfolk, Va.	....do	Edenton			15 08	18 33			54 28
	Brands claiming					15.63	19 00			56 27
7970	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Nitrate of Soda	Raleigh			15.20	18.48			54 72
8090	Farmers Cotton Oil Co., Wilson, N. C.	....do	Fayetteville			15.20	18.48			54 72
8356	Farmers Guano Co., Raleigh, N. C.	....do	Roseboro			15.20	18 48			54 72
8355	Gibson Oil Co., Gibson, N. C.	....do	Red Springs			15.24	18 53			54.86
8310	McNair, John F., Laurinburg, N. C.	....do	Laurinburg			15 48	18.82			55 73
8289	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	....do	Seven Springs			15.44	18.77			55 58
	Brands claiming			21 50		3.71	4 50			28 41
8168	Baugh & Sons Co., Norfolk, Va.	Baugh's Raw Bone Meal	Chadbourn	19.45		3 50				26 21
8575	Columbia Guano Co , Norfolk, Va.	Columbia Raw Bone Meal	Greensboro	21.98		4.00	4.86			29.79
	Brand claiming			22 50		3 71	4.50			29 11
8464	Union Guano Co., Winston, N. C.	Animal Bone Meal	Reidsville	21.65		4.30	5.23			30.63
	Brand claiming			21.73		4 12	5.00			30 04
8465	Wakefield, Thomas, Friendship, N. C.	Pure Bone Meal	Brown Summit			4 10	4.98			29 46
	Brand claiming			14.00		2.46	3 00	2 00		21 59
8359	Peruvian Guano Corporation, Charleston, S. C.	High Grade Genuine Peruvian Guano.	Sanford	17.58		2.46	3.00	2 12		24 23
	Brands claiming			18.00		2 88	3.50	3 25		27 40
7859	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	Greenville	18.03		2 84	3 45	2 15		26 06
8129	....do	....do	Williamston	17.53		2 76	3.36	2.56		25 85
	Brand claiming			8.00		7 00	8.50	3.50		36.75
8358	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Top Dresser	Carthage			5 66	6.88	4 10		35 14
	Brand claiming			17.00		4 52	5 50	2 50		32 27
8027	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	Wilmington	17.75		2 94	3.57	2 10		26 20
	Brand claiming			17.00		5 38	6 54	2 50		35 63
8026	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	Wilmington	17.83		5 12	6 22	2 69		35 21

*Total Phosphoric in Bone Meal, Peruvian Guano, and Thomas Phosphate valued at 3½ cents per pound.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100. *Total Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.	Relative Value per Ton at Factory.
	RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brand claiming			12 00			4.52	5.50	2 50				$28 78
7891	Peruvian Guano Corporation, Charleston, S. C.	Genuine Peruvian Guano	Farmville	12 80			4.78	5.81	2 70				30 57
	Brand claiming						13.98	17 00					50 33
8320	Coe-Mortimer Co., Charleston, S. C.	Dried Blood	Gastonia				13.52	16.44					48 67
	Brands claiming			6 87			8 23	10.00					34 44
8193	Baugh & Sons Co., Norfolk, Va.	Fine Ground Fish	Manly	7.25			7.25	8.81					31 86
8069	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Fish Scrap	Williamston				7 94	9 65					28 58
	Brand claiming						9 30	11.31					33 48
3766	Peruvian Guano Corporation, Charleston, S. C.	Fish Scrap	Palmyra				8 96	10.89					32 26
	Brand claiming						10 69	13 00					38 48
8420	Coe-Mortimer Co., Charleston, S. C.	Dried Blood, No. 3	Greenville				10.68	12.98					38 45
	Brand claiming			14 50									10 15
8172	Coe-Mortimer Co., Charleston, S. C.	Thomas Phosphate	Chadbourn	14 30									10 01
	Brands claiming			18 00									12 60
8032	Coe-Mortimer Co., Charleston, S. C.	Thomas Phosphate	Wilmington	18 63									13.04
8325	----do	----do	Hardison	17 35									12.14

*Total Phosphoric in Bone Meal, Peruvian Guano, and Thomas Phosphate valued at 3½ cents per pound.

II. ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
4090	Battleboro Oil Co., Battleboro, N. C.	Battleboro	6.18	7.50	6.52	7.93
4068	....do	....do	6.18	7.50	6.48	7.88
4083	....do	....do	6.18	7.50	6.40	7.78
4028	....do	....do	6.18	7.50	6.24	7.58
4158	Chatham Cotton Oil Co., Pittsboro, N. C.	Manly	6.18	7.50	6.14	**7.47**
4111	....do	Raleigh	6.18	7.50	6.42	7.81
4189	Chester Oil Mill, Chester, S. C.	Lenoir	6.18	7.50	6.40	7.78
4042	Cleveland Oil and Fertilizer Co., Cleveland, N. C.	Cleveland	6.18	7.50	6.44	7.83
4102	Consumers Cotton Oil Co., Tarboro, N. C.	Goldsboro	6.18	7.50	6.44	7.83
4191	....do	Tarboro	6.18	7.50	6.20	7.54
4156	....do	....do	6.18	7.50	6.10	**7.42**
4171	....do	....do	6.18	7.50	5.98	**7.27**
4139	Cotton Oil and Ginning Co., Scotland Neck, N. C.	Williamston	6.18	7.50	6.08	**7.39**
4047	Dunn Oil Mill Co., Dunn, N. C.	Dunn	6.18	7.50	6.44	7.83
4132	....do	....do	6.18	7.50	6.30	7.66
4165	....do	Roseboro	6.18	7.50	5.72	**6.95**
4134	Eastern Cotton Oil Co., Hertford, N. C.	Chapanoke	6.18	7.50	6.46	7.85
4146	....do	Washington	6.18	7.50	6.26	7.61
4053	....do	Edenton	6.18	7.50	6.24	7.59
4192	....do	....do	6.18	7.50	6.18	7.51
4128	Elba Mfg. Co., Charlotte, N. C.	Monroe	6.18	7.50	6.60	8.02
4135	....do	Laurinburg	6.18	7.50	6.48	7.88
4034	....do	Arlington	6.18	7.50	6.46	7.85
4138	....do	Greensboro	6.18	7.50	6.02	**7.32**
4121	Farmers Oil Mill Co., Nashville, N. C.	Nashville	6.18	7.50	6.48	7.88
4160	....do	....do	6.18	7.50	6.44	7.83
4122	....do....Wilson, N. C.	Wilson	6.18	7.50	6.52	7.93
4148	....do	....do	6.18	7.50	5.86	**7.12**
4105	Fremont Oil Mill Co., Fremont, N. C.	Fremont	6.18	7.50	6.24	7.59
4168	Georgia Cotton Oil Co., Augusta, Ga.	Clinton	6.18	7.50	6.10	**7.42**
4058	Havens Oil Co., Washington, N. C.	Washington	6.18	7.50	6.48	7.88
4145	....do	....do	6.18	7.50	6.46	7.85
4149	....do	....do	6.18	7.50	6.32	7.68
4110	Kershaw Oil Mill, Kershaw, N. C.	Hickory	6.18	7.50	6.36	7.73
4029	Kings Mountain Cotton Oil Co., Kings Mountain, N. C.	Kings Mountain	6.18	7.50	7.06	8.57

ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
4025	Kings Mountain Cotton Oil Co., Kings Mountain, N. C.	Kings Mountain	6.18	7.50	6.90	8.38
4137	Laurinburg Oil Co., Laurinburg, N. C.	Laurinburg	6.18	7.50	6.58	8.00
4106	....do	....do	6.18	7.50	6.26	7.61
4114	....do	Hamlet	6.18	7.50	5.68	**6.91**
4147	Lenoir Oil and Ice Co., Kinston, N. C.	Morehead	6.18	7.50	6.44	7.83
4130	....do	Dearborn	6.18	7.50	6.36	7.73
4055	....do	Scotland Neck	6.18	7.50	6.32	7.68
4041	Lorene Cotton Oil Mills, Mooresville, N. C.	Mooresville	6.18	7.50	6.58	8.00
4157	Louisburg Cotton Oil Co., Louisburg, N. C.	Louisburg	6.18	7.50	6.20	7.54
4044	Lumberton Cotton Oil and Ginning Co., Lumberton, N. C.	Lumberton	6.18	7.50	6.36	7.73
4161	McCaw Mfg. Co., Macon, Ga.	Bryson City	6.18	7.50	6.22	7.56
4054	Morgan Oil and Fertilizer Co., Red Springs, N. C.	Red Springs	6.18	7.50	7.06	8.58
4127	North Carolina Cotton Oil Co., Charlotte, N. C.	Wadesboro	6.18	7.50	6.22	7.56
4107	....do	Waco	6.18	7.50	6.16	**7.49**
4120	....do....Henderson, N. C.	Henderson	6.18	7.50	6.18	7.51
4150	....do	Oxford	6.18	7.50	5.98	**7.27**
4112	....do....Raleigh, N. C.	Raleigh	6.18	7.50	6.04	**7.34**
4153	....do	....do	6.18	7.50	5.76	**7.00**
4057	....do....Wilmington, N. C.	Bethel	6.18	7.50	6.10	**7.42**
4064	....do	Wilmington	6.18	7.50	6.02	**7.32**
4155	....do	Pinetop	6.18	7.50	5.98	**7.27**
4159	....do	Chadbourn	6.18	7.50	5.88	**7.15**
4176	....do	Magnolia	6.18	7.50	5.82	**7.08**
4077	Pine Level Oil Mill Co., Pine Level, N. C.	Pine Level	6.18	7.50	6.66	8.10
4133	....do	Smithfield	6.18	7.50	6.54	7.95
4104	....do	Goldsboro	6.18	7.50	6.36	7.73
4037	....do	Pine Level	6.18	7.50	6.32	7.68
4024	....do	....do	6.18	7.50	6.32	7.68
4061	....do	....do	6.18	7.50	5.96	**7.24**
4095	Pitt County Oil Co., Winterville, N. C.	Greenville	6.18	7.50	6.06	**7.37**
4079	Planters Cotton-seed Oil Co., Rocky Mount, N. C.	Rocky Mount	6.18	7.50	6.20	7.54
4065	....do	....do	6.18	7.50	6.08	**7.38**
4010	Scotland Neck Cotton Oil and Ginning Co., Scotland Neck, N. C.	Scotland Neck	6.18	7.50	6.16	**7.48**
4059	Southern Cotton Oil Co., Charlotte, N. C.	Charlotte	6.18	7.50	6.58	8.00
4152	....do	Raleigh	6.18	7.50	6.44	7.83
4124	....do	Charlotte	6.18	7.50	6.12	**7.44**
4117	....do	Hickory	6.18	7.50	6.10	**7.42**
4109	....do....Concord, N. C.	Concord	6.18	7.50	6.86	8.34

ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
4174	Southern Cotton Oil Co., Concord, N. C.	Concord	6.18	7.50	6.62	8.05
4129	---do---	---do---	6.18	7.50	6.16	**7.49**
4063	---do---	Conetoe, N. C.	Conetoe	6.18	7.50	6.62	8.05
4056	---do---	---do---	6.18	7.50	5.94	**7.22**
4046	---do---	Davidson, N. C.	Davidson	6.18	7.50	6.98	8.49
4050	---do---	---do---	6.18	7.50	6.90	8.39
4131	---do---	Fayetteville, N. C.	Fayetteville	6.18	7.50	6.22	7.56
4113	---do---	---do---	6.18	7.50	6.26	7.61
4186	---do---	---do---	6.18	7.50	6.16	**7.49**
4115	---do---	Gastonia, N. C.	Kings Mountain	6.18	7.50	6.50	8.39
4049	---do---	Gastonia	6.18	7.50	6.74	8.19
4103	---do---	Goldsboro, N. C.	Goldsboro	6.18	7.50	6.30	7.71
4151	---do---	---do---	6.18	7.50	6.22	7.56
4126	---do---	Monroe, N. C.	Monroe	6.18	7.50	6.54	7.95
4175	---do---	---do---	6.18	7.50	6.36	7.73
4116	---do---	Rocky Mount, N. C.	Rocky Mount	6.18	7.50	6.44	7.83
4062	---do---	---do---	6.18	7.50	6.16	**7.49**
4045	---do---	Selma, N. C.	Smithfield	6.18	7.50	6.38	7.76
4043	---do---	Shelby, N. C.	Shelby	6.18	7.50	6.20	7.54
4108	---do---	---do---	6.18	7.50	6.08	**7.39**
4154	---do---	---do---	6.18	7.50	5.88	**7.15**
4018	---do---	Spartanburg, S. C.	Asheville	6.18	7.50	6.66	8.10
4173	---do---	Hendersonville	6.18	7.50	6.56	7.98
4163	---do---	---do---	6.18	7.50	6.04	**7.34**
4119	---do---	Spring Hope, N. C.	Spring Hope	6.18	7.50	6.78	8.24
4011	---do---	Tarboro, N. C.	Palmyra	6.18	7.50	7.70	9.35
4185	---do---	Greenville	6.18	7.50	6.34	7.71
4052	---do---	Hobgood	6.18	7.50	6.18	7.51
4187	---do---	Edenton	6.18	7.50	6.10	**7.42**
4125	---do---	Wadesboro, N. C.	Wadesboro	6.18	7.50	6.22	7.56
4123	---do---	Wilson, N. C.	Wilson	6.18	7.50	6.48	7.88
4136	---do---	---do---	6.18	7.50	6.12	**7.44**
4059	Speed Milling Co., Speed, N. C.	Speed	6.18	7.50	6.78	8.24
4093	Stanly Cotton Oil Co., Norwood, N. C.	Norwood	6.18	7.50	6.28	7.64
4051	Tar River Oil Co., Tarboro, N. C.	Shiloh	6.18	7.50	6.38	7.76
4162	Taylor Mfg. Co., Columbia, S. C.	Waynesville	6.18	7.50	6.22	7.56
4205	Tennille Oil Co., Tennille, Ga.	Gastonia	6.18	7.50	5.70	**6.93**

III. FERTILIZER BRANDS REGISTERED FOR 1910.

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Atlantic Chemical Corporation, Norfolk, Va.—			
Atlantic High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Atlantic 14 Per Cent Acid Phosphate	14.00	....	....
Atlantic Dissolved Bone	13.00	....	....
Atlantic Acid Phosphate	12.00	....	....
Atlantic 10 and 5 Bone and Potash Mixture	10.00	....	5.00
Atlantic 10 and 4 Bone and Potash Mixture	10.00	....	4.00
Atlantic Bone and Potash for Grain	10.00	....	3.00
Atlantic Bone and Potash Mixture	10.00	....	2.00
Atlantic Meal Compound	9.00	2.27	2.00
Atlantic Cotton Grower	9.00	2.06	1.00
Atlantic Special Guano	9.00	1.65	1.00
Atlantic Special Truck Guano	8.00	3.30	4.00
Atlantic High Grade Tobacco Guano	8.00	2.47	3.00
Atlantic High Grade Cotton Guano	8.00	2.47	3.00
Atlantic Tobacco Grower	8.00	2.06	3.00
Atlantic Tobacco Compound	8.00	2.06	2.00
Atlantic Special Wheat Fertilizer	8.00	1.65	2.00
Atlantic Soluble Guano	8.00	1.65	2.00
Atlantic 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Atlantic 7 Per Cent Truck Guano	7.00	5.77	7.00
Atlantic Potato Guano	7.00	4.12	5.00
Atlantic Side Dresser	4.00	8.22	4.00
Atlantic Special Top Dresser	4.00	6.18	2.50
Atlantic Top Dresser	....	7.42	3.00
Pure Raw Bone Meal.....Total	21.50	3.71	....
Corona Cotton Compound	9.00	1.65	3.00
Oriental High Grade Guano	8.00	3.30	4.00
Paloma Tobacco Guano	8.00	3.30	4.00
Boon's Special Guano	8.00	2.47	4.00
Apex Peanut Grower	8.00	1.02	4.00
Perfection Peanut Grower	7.00	....	5.00
Nitrate of Soda	....	15.22	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Geo. L. Arps & Co., Norfolk, Va.—			
Arps' H. G. 16 Per Cent Acid Phosphate	16.00	....	....
Arps' "Go-a-Head" Guano for Trucks, Cotton and Tobacco	8.00	3.30	4.00
Arps' Tobacco Guano	8.00	2.47	3.00
Arps' Quick Growth for All Crops	8.00	2.47	3.00
Arps' Premium Guano for Cotton, Tobacco and All Spring Crops	8.00	1.65	2.00
Arps' Standard Truck Guano	7.00	4.12	5.00
Arps' Potato Guano	6.00	5.76	5.00
Arps' Scuppernong Guano for Trucks	6.00	4.12	7.00
14 Per Cent Acid Phosphate	14.00	....	....
Geo. L. Arps & Co.'s Big Yield Guano	8.00	1.65	2.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Acme Manufacturing Co., Wilmington, N. C.—			
Acme Acid Phosphate	16.00	....	....
Acme High Grade Acid Phosphate	14.00	....	....
Acme 13 Per Cent Acid Phosphate	13.00	....	....
Acme Bone and Potash	11.00	....	2.00
Acme Melon Grower	10.00	3.30	5.00
Acme Bone and Potash	10.00	....	4.00
Acme Bone and Potash	10.00	....	2.00
Acme Cotton Grower	9.00	2.27	2.00
Acme Plumb Good Fertilizer	8.00	3.30	6.00
Acme Special Fertilizer for Cotton	8.00	4.12	7.00
Acme Crop Grower	8.00	2.47	4.00
Acme Plant Food	8.00	2.47	2.50
Acme Fertilizer for Tobacco	8.00	2.47	2.50
Acme Fertilizer	8.00	2.47	2.50
Acme Special Grain Fertilizer	8.00	1.65	2.00
Acme Root Crop Guano	7.00	4.12	7.00
Acme Standard Truck Guano	7.00	4.12	5.00
Acme High Grade Guano	6.00	4.95	8.00
Acme Truck Guano	6.00	3.30	8.00
Acme Corn Guano	6.00	2.47	3.00
Acme Top Dresser	....	7.42	3.00
Gibson's Melon Grower	10.00	3.30	5.00
Quickstep Fertilizer	8.00	3.30	4.00
Quickstep Fertilizer for Tobacco	8.00	3.29	4.00
Currie's High Grade Fertilizer	8.00	2.47	4.00
Best's Fish Scrap Guano, 8-3-3	8.00	2.47	3.00
Pee Dee Special Fertilizer	8.00	2.47	3.00
Pee Dee Special for Tobacco	8.00	2.47	3.00
Tiptop Crop Grower	8.00	2.06	3.00
Tiptop Tobacco Grower	8.00	2.06	3.00
Lattimer's Complete Fertilizer	8.00	2.06	2.00
Best's Complete Fertilizer, 8-2½-2	8.00	2.06	2.00
Gem Fertilizer	8.00	1.65	2.00
Gem Fertilizer for Tobacco	8.00	1.65	2.00
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.85	....
12 Per Cent Tankage	....	9.85	....
Muriate of Potash	....	....	48.00
High Grade German Kainit	....	....	16.00
Pure German Kainit	....	....	12.00
Ashepoo Fertilizer Co., Charleston, S. C.—			
High Grade Ashepoo Dissolved Phosphate	16.00	....	....
High Grade Ashepoo Acid Phosphate	14.00	....	....
High Grade Ashepoo XXXX Acid Phosphate	14.00	....	....
H. G. Ashepoo Bone and Potash	12.00	....	2.00
H. G. Ashepoo Cantaloupe Guano	10.00	2.46	10.00
High Grade Ashepoo Watermelon Guano	10.00	3.29	5.00
High Grade Ashepoo Superpotash Acid Phosphate	10.00	....	4.00
High Grade Ashepoo Fruit Grower	8.00	3.91	2.75
High Grade Ashepoo Perfection Guano	8.00	3.29	6.00
High Grade Ashepoo Guano	8.00	3.29	4.00
High Grade Ashepoo Special Cotton-seed Meal Guano	8.00	2.46	4.00
High Grade Ashepoo Bird and Fish Guano	8.00	2.46	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
High Grade Ashepoo Meal Mixture	8.00	2.46	3.00
High Grade Ashepoo X Tobacco Fertilizer	8.00	2.46	3.00
High Grade Ashepoo Golden Tobacco Producer	8.00	2.46	3.00
High Grade Ashepoo Ammoniated Superphosphate	8.00	2.46	2.00
High Grade Ashepoo Farmers' Special	8.00	2.06	3.00
High Grade Ashepoo Truck Guano	7.00	4.12	5.00
High Grade Ashepoo Vegetable Guano	5.00	4.12	5.00
High Grade Ashepoo Nitrogenous Top Dressing	3.00	7.00	2.00
High Grade Eutaw Acid Phosphate	14.00	....	....
H. G. Eutaw Superpotash Acid Phosphate	10.00	....	4.00
High Grade Eutaw X Golden Fertilizer	8.00	2.46	4.00
High Grade Eutaw Special Cotton-seed Meal Guano	8.00	2.46	4.00
High Grade Taylor's Circle Guano	9.00	1.65	4.00
High Grade Carolina XXX Guano	8.00	2.46	3.00
Standard Ashepoo XXX Acid Phosphate	13.00	....	....
Standard Ashepoo Acid Phosphate and Potash,	12.00	....	1.00
Standard Ashepoo Dissolved Bone	12.00	....	....
Standard Ashepoo XX Acid Phosphate	12.00	....	....
Standard Ashepoo Potash and Acid Phosphate,	11.00	....	1.00
Standard Ashepoo Potash Compound	10.00	....	3.00
Standard Ashepoo Wheat and Oats Specific	9.50	1.65	1.00
Standard Ashepoo Fertilizer	9.00	1.85	1.00
Standard Ashepoo Harrow Brand Raw Bone Superphosphate	9.00	1.65	2.00
Standard Ashepoo Guano	8.50	2.06	1.00
Standard Ashepoo XX Guano	8.50	1.65	2.00
Standard Ashepoo Circle Guano	8.00	2.06	2.00
Standard Ashepoo XXX Guano	8.00	1.65	2.00
Standard Ashepoo Special Fertilizer	8.00	1.65	2.00
Standard Eutaw XXX Acid Phosphate	13.00	....	....
Standard Eutaw Acid Phosphate and Potash	12.00	....	1.00
Standard Eutaw XX Acid Phosphate	12.00	....	....
Standard Eutaw Potash Acid Phosphate	11.00	....	1.00
Standard Eutaw Fertilizer	9.00	1.85	1.00
Standard Eutaw XXX Guano	9.00	1.65	2.00
Standard Eutaw XX Guano	8.50	1.65	2.00
Standard Eutaw Circle Guano	8.00	2.06	2.00
Standard Carolina Acid Phosphate	13.00	....	....
Standard Circle Bone	13.00	....	....
Standard Coomassie Acid Phosphate	12.00	....	....
Standard Palmetto Potash Acid Phosphate	11.00	....	1.00
Standard Enorce Acid Phosphate and Potash,	10.00	....	2.00
Standard Coomassie Circle Fertilizer	8.00	1.65	2.00
Standard Carolina Guano	8.00	1.65	2.00
Standard P. D. Fertilizer	8.00	1.65	2.00
Standard Bronwood Acid Phosphate	8.00	....	4.00
Taylor's XX Ammoniated Dissolved Fertilizer,	10.00	.82	1.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	45.00
Nitrate of Potash	....	....	18.00
German Kainit	....	....	12.00
The Armour Fertilizer Works, Atlanta, Chicago and Wilmington—			
Armour's Raw Bone Meal.....Total	22.00	3.70	....
Armour's Slaughter House Fertilizer	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Armour's Special Top Dresser	....	7.82	1.00
17 Per Cent Acid Phosphate	17.00	....	....
16 Per Cent Acid Phosphate	16.00	....	....
Star Phosphate	14.00	....	....
13 Per Cent Acid Phosphate	13.00	....	....
12 Per Cent Acid Phosphate	12.00	....	....
Phosphoric Acid and Potash	10.00	....	5.00
Superphosphate and Potash	10.00	....	1.00
M. H. White & Co.'s Special Corn Mixture	10.00	....	2.00
Phosphate and Potash No. 1	10.00	....	2.00
Ammoniated Dissolved Bone and Potash	10.00	1.65	2.00
African Cotton Grower	9.00	2.47	3.00
Bone and Dissolved Bone with Potash	9.00	1.65	3.00
Bone, Blood and Potash	8.00	4.11	7.00
Van Lindley's Special	8.00	4.11	2.00
Fertilizer No. 846	8.00	3.30	6.00
Special Trucker	8.00	3.30	4.00
All Soluble	8.00	2.88	4.00
Truck and Berry Special	8.00	2.47	10.00
Fertilizer No. 836	8.00	2.47	6.00
Cotton Special	8.00	2.47	3.00
Tobacco Special	8.00	2.47	3.00
Carolina Cotton Grower	8.00	2.47	2.00
Berry King	8.00	2.06	4.00
Gold Medal for Tobacco	8.00	2.06	3.00
Sweet Potato Special	8.00	2.06	3.00
Champion	8.00	2.06	2.50
King Cotton	8.00	2.06	2.00
High Grade Potato	8.00	1.65	10.00
Fruit and Root Crop Special	8.00	1.65	5.00
Carolina Cotton Special	8.00	1.65	3.00
Standard Cotton Grower	8.50	1.65	2.00
General	8.00	1.65	2.00
Phosphate and Potash No. 2	8.00	....	5.00
Phosphate and Potash No. 3	8.00	....	4.00
7 Per Cent Trucker	6.00	5.76	5.00
5 Per Cent Trucker	6.00	4.12	7.00
Manure Substitute	6.00	3.30	4.00
Manure Substitute	6.00	3.30	4.00
10 Per Cent Trucker	5.00	8.24	3.00
Top Dresser	5.00	8.24	2.00
Special Formula for Tobacco	4.00	3.30	5.00
Harvey's Special	4.00	3.30	4.00
10 Per Cent Tankage	2.00	8.24	....
Nitrate of Soda	....	14.81	....
Dried Blood	....	13.16	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
American Fertilizing Co., Norfolk, Va.—			
American High Grade Acid Phosphate	16.00	....	....
American Standard Cotton Grower	10.00	1.65	2.00
American Formula for Wheat and Corn	10.00	....	5.00
American Bone Mixture	9.00	.83	2.00
American Nonpareil Tobacco Grower	8.00	3.29	4.00
American Eagle Guano	8.00	2.47	3.00
American No. 1 Fertilizer	8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
American No. 2 Fertilizer	8.00	1.65	2.00
American Special Potash Mixture for Wheat	8.00	....	4.00
American 7-7-7 for Irish Potatoes	7.00	5.76	7.00
American Fish Scrap Guano	7.00	3.29	4.00
American Standard Top Dresser	4.00	6.18	2.50
American High Grade Top Dresser	4.00	8.24	4.00
Bone Meal .....Total	22.50	3.71	....
Bone and Peruvian Guano	8.00	1.65	2.00
High Grade Acid Phosphate	14.00	....	....
Eagle Brand Acid Phosphate	13.00	....	....
Acid Phosphate	12.00	....	....
Double Extra Bone and Potash	12.00	....	5.00
Double Dissolved Bone and Potash	10.00	....	4.00
Dissolved Bone and Potash for Corn and Wheat	10.00	....	2.00
Strawberry and Asparagus Guano	9.00	2.88	9.00
Pitt County Special Fertilizer	9.00	2.88	5.00
Special Formula Guano for Yellow Leaf Tobacco	9.00	2.88	5.00
Blood and Bone Compound	8.50	2.06	1.00
Peruvian Mixture	8.50	1.65	1.50
Peruvian Mixture Guano Especially Prepared for Sweet Potatoes	8.00	3.29	5.00
N. C. and S. C. Cotton Grower	8.00	3.29	4.00
J. G. Miller & Co.'s Yellow Leaf Fertilizer	8.00	2.47	3.00
Bob White Fertilizer for Tobacco	8.00	2.06	1.50
A. L. Hanna's Special	8.00	1.65	2.00
Cooper's Genuine Eagle Island	8.00	1.65	2.00
10 Per Cent Ammoniated Guano	7.00	8.24	2.50
Standard 7 Per Cent Ammonia Guano	7.00	5.76	5.00
Special Potato Guano	7.00	4.12	7.00
Special Potato Guano	6.00	4.12	7.00
Kale, Spinach and Cabbage Guano	7.00	4.12	4.00
Stable Manure Substitute	7.00	2.47	4.00
Nitrate of Soda	....	14.83	....
Ground Fish Scraps	....	8.24	....
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Atlantic Fertilizer Co., Baltimore, Md.—			
Farmers' Alkaline Bone	10.00	....	2.00
American Agricultural Chemical Co., New York—			
A. A. C. Co.'s Fine Ground Bone.....Total	22.88	2.47	....
A. A. C. Co.'s Superphosphate	16.00	....	....
A. A. C. Co.'s New Rival Crop Producer	10.00	.82	1.00
A. A. C. Co.'s Fidelity Crop Grower	8.00	.82	3.00
A. A. C. Co.'s Palmetto Alkaline Phosphate	8.00	....	4.00
A. A. C. Co.'s Bull Head Potato and Vegetable Manure	6.00	4.11	7.00
A. A. C. Co.'s Nitrate of Soda	....	15.00	....
A. A. C. Co.'s Muriate of Potash	....	....	49.00
A. A. C. Co.'s Sulphate of Potash	....	....	48.00
A. A. C. Co.'s Genuine German Kainit	....	....	12.00
Baker's Tobacco Fertilizer	8.00	2.47	3.00
Canton Chemical Gem Phosphate	12.00	....	....
Canton Chemical Animal Bone Fertilizer	9.00	1.85	4.00
Canton Chemical Baker's Tobacco Fertilizer	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Canton Chemical Superior High Grade Fertilizer	8.00	2.47	3.00
Canton Chemical CCC Special Compound	8.00	2.06	6.00
Canton Chemical Baker's Standard High Grade Guano	8.00	2.06	3.00
Canton Chemical Virginia Standard Manure	8.00	2.06	2.00
Canton Chemical Baker's Fish Guano	8.00	1.65	2.00
Canton Chemical Game Guano	8.00	1.65	2.00
Canton Chemical Excelsior Trucker	7.00	4.11	5.00
Canton Chemical Truckers' Special 7 Per Cent.	6.00	5.76	5.00
Detrick's XXtra Acid Phosphate	14.00	....	....
Detrick's P. & B. Special Fertilizer	12.00	....	3.00
Detrick's Superior Animal Bone Fertilizer	9.00	1.85	4.00
Detrick's Special Tobacco Fertilizer	8.00	2.47	3.00
Detrick's Vegetator Ammoniated Superphosphate	8.00	2.06	3.00
Detrick's Kangaroo Komplete Kompound	8.00	1.65	3.00
Detrick's Royal Crop Grower	8.00	1.65	2.00
Detrick's Fish Mixture	8.00	1.65	2.00
Detrick's Special Trucker	7.00	4.11	5.00
Detrick's Gold Basis	6.00	5.76	5.00
Detrick's Gold Eagle	6.00	2.47	6.00
Holmes & Dawson Crop Maker	8.00	1.65	2.00
Holmes & Dawson Gold Dust Guano	9.00	1.65	2.00
Holmes & Dawson's Productive Cotton and Peanut Grower	9.00	2.47	2.00
Holmes & Dawson Triumph Soluble	8.00	1.65	2.00
Lazaretto Acid Phosphate	14.00	....	....
Lazaretto High Grade Dissolved Phosphate and Potash	12.00	....	5.00
Lazaretto Retriever Animal Bone Fertilizer	9.00	1.85	4.00
Lazaretto Peanut Grower	9.00	.82	3.00
Lazaretto Challenge Fertilizer	8.00	2.47	3.00
Lazaretto Special Tobacco and Potato Fertilizer	8.00	2.47	3.00
Lazaretto Climax Plant Food	8.00	2.06	3.00
Lazaretto Universal Compound	8.00	2.06	2.00
Lazaretto Crop Grower	8.00	1.65	2.00
Lazaretto Early Trucker	7.00	4.11	5.00
Lazaretto Truckers' Favorite	6.00	5.76	5.00
Pure Ground Bone.....Total	20.59	3.70	....
Reese Pacific Guano for Tobacco	8.50	2.47	2.50
Reese Pacific Guano	8.00	1.65	2.00
Savage, Son & Co. Purity Guano	8.00	1.65	2.00
Slingluff's British Mixture	8.00	2.06	2.50
Zell's Dissolved Phosphate	14.00	....	....
Zell's High Grade Potash Fertilizer	10.00	....	4.00
Zell's Electric Phosphate	10.00	....	2.00
Zell's Royal High Grade Fertilizer	9.00	2.06	2.00
Zell's Victoria Animal Bone Compound	9.00	1.85	4.00
Zell's Special Compound for Potatoes and Vegetables	8.00	2.47	4.00
Zell's Tobacco Fertilizer	8.00	2.47	4.00
Zell's Bright Tobacco Grower	8.00	2.47	3.00
Zell's Reliance High Grade Manure	8.00	2.47	3.00
Zell's Special Compound for Tobacco	8.00	1.65	2.00
Zell's Calvert Guano	8.00	1.65	2.00
Zell's Ammoniated Superphosphate	8.00	1.65	2.00
Zell's Fish Guano	8.00	1.65	2.00
Zell's Truck Grower	7.00	4.11	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Zell's 7 Per Cent Potato and Vegetable Manure	6.00	5.76	5.00
Zell's 10 Per Cent Trucker	5.00	8.23	3.00
The American Agricultural Chemical Co., Baltimore, Md.—			
Canton Chemical Baker's Dissolved S. C. Phosphate	14.00	....	....
Canton Chemical Soluble Alkaline Phosphate,	12.00	....	3.00
Canton's Chemical Soluble Phosphate and Potash	10.00	....	2.00
Detrick's Victory Alkaline Bone	12.00	....	5.00
Detrick's Soluble Phosphate and Potash	10.00	....	2.00
Detrick's Quickstep Phosphate for Potatoes and Tobacco	8.00	2.47	4.00
Lazaretto Alkaline Bone Phosphate	12.00	....	3.00
Lazaretto Dissolved Phosphate and Potash	10.00	....	2.00
Lazaretto Manure Substitute	8.00	3.29	4.00
The American Agricultural Chemical Co. Royal Alkaline Bone	10.00	....	4.00
The American Agricultural Chemical Co. Enterprise Alkaline Bone	8.00	....	5.00
The American Agricultural Chemical Co. Empire Trucker	7.00	3.29	4.00
Dry Ground Fish	6.00	8.23	....
Special H. G. Dried Blood	....	13.16	....
A. D. Adair & McCarty Bros., Atlanta, Ga.—			
Adair's High Grade Dissolved Bone, No. 16	16.00	....	....
Adair's High Grade Dissolved Bone	14.00	....	....
Adair's Dissolved Bone	12.00	....	....
Adair's H. G. Blood and Bone	10.00	2.47	3.00
Adair's Soluble Pacific Guano	10.00	1.65	2.00
Adair's Wheat and Grass Grower, No. 8	10.00	....	8.00
Adair's Wheat and Grass Grower, No. 6	10.00	....	6.00
Adair's Wheat and Grass Grower, No. 5	10.00	....	5.00
Adair's Wheat and Grass Grower	10.00	....	4.00
Adair's Blood, Bone and Tankage Guano	9.00	.82	2.00
Adair's Ammoniated Dissolved Bone	8.00	1.65	2.00
Adair's Special Potash Mixture, No. 6	8.00	....	6.00
Adair's Special Potash Mixture, No. 5	8.00	....	5.00
Adair's Special Potash Mixture	8.00	....	4.00
A. & M. 13-4	13.00	....	4.00
David Harum Extra High Grade Guano	10.00	3.30	4.00
H. G. Potash Compound, No. 8	10.00	....	8.00
H. G. Potash Compound, No. 6	10.00	....	6.00
H. G. Potash Compound, No. 5	10.00	....	5.00
High Grade Potash Compound	10.00	....	4.00
McCarty's Potash Formula, No. 5	12.00	....	5.00
McCarty's Potash Formula, No. 4	12.00	....	4.00
McCarty's Potash Formula	12.00	....	2.00
McCarty's High Grade Corn Grower	10.00	1.65	2.00
McCarty's High Grade Cotton Grower	10.00	1.65	2.00
McCarty's Wheat Special	10.00	.82	3.00
McCarty's Corn Special	10.00	.82	3.00
Special Wheat Compound	10.00	1.65	4.00
Special Corn Compound	10.00	1.65	4.00
Special Vegetable Compound	10.00	1.65	4.00
Special Potato Compound	10.00	1.65	4.00
Special Corn Grower	8.00	1.65	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Special Wheat Grower	8.00	1.65	6.00
Special Potato Grower	8.00	1.65	6.00
Special Vegetable Grower	8.00	1.65	6.00
Old Time Fish Scrap Guano	10.00	1.65	2.00
Standard Corn Grower	8.00	1.65	2.00
Planters' Soluble Fertilizer	8.00	1.65	2.00
Golden Grain Compound	8.00	.82	3.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	50.00
Asheville Packing Co., Asheville, N. C.—			
Asheville Packing Co.'s Extra H. G. Potash Mixture	13.00	....	4.00
Asheville Packing Co.'s Extra H. G. Fertilizer	10.00	3.30	4.00
Asheville Packing Co.'s Extra H. G. Blood and Bone	10.00	2.47	3.00
Asheville Packing Co.'s Extra H. G. Cotton Special	10.00	1.65	4.00
Asheville Packing Co.'s H. G. Wheat, Corn and Oat Special	10.00	1.65	2.00
Asheville Packing Co.'s High Grade Biltmore Wheat Grower	10.00	1.65	2.00
Asheville Packing Co.'s Standard Bone and Potash	10.00	.82	1.00
Asheville Packing Co.'s H. G. Special Potash Mixture	10.00	....	4.00
Asheville Packing Co.'s Special XXX Wheat Grower	10.00	....	2.00
Asheville Packing Co.'s Standard Potato	9.00	.82	2.00
Asheville Packing Co.'s Extra H. G. Vegetable Special	8.00	4.12	5.00
Asheville Packing Co.'s H. G. Special Tobacco and Vegetable Fertilizer	8.00	2.47	3.00
Asheville Packing Co.'s Extra H. G. Potato Special	8.00	1.65	6.00
Asheville Packing Co.'s Complete Fertilizer	8.00	1.65	2.00
Asheville Packing Co.'s Corn and Wheat	8.00	.82	3.00
Asheville Packing Co.'s Special Bone and Potash	8.00	....	4.00
Baugh & Sons Co., Phila., Pa., and Norfolk, Va.—			
Baugh's Raw Bone Meal, Warranted Pure, Total	21.50	3.70	....
Baugh's 16 Per Cent Acid Phosphate	16.00	....	....
Baugh's Pure Bone and Muriate of Potash Mixture .....Total	15.00	2.47	5.00
Baugh's High Grade Acid Phosphate	14.00	....	....
Baugh's Pure Dissolved Animal Bones	13.00	2.06	....
Baugh's High Grade Cotton and Truck Guano,	10.00	1.65	2.00
Baugh's High Grade Potash Mixture	10.00	....	4.00
Baugh's Soluble Alkaline Superphosphate	10.00	....	2.00
Baugh's Special Guano	8.00	3.30	6.00
Baugh's Fish, Bone and Potash	8.00	3.30	4.00
Baugh's Fruit and Berry Guano	8.00	2.47	10.00
Baugh's Special Tobacco Guano	8.00	2.47	5.00
Baugh's Grand Rapids High Grade Truck Guano	8.00	2.47	3.00
Baugh's Sweet Potato Guano for Sweet Potatoes, Peas and Melons	8.00	2.47	3.00
Baugh's High Grade Tobacco Guano	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Baugh's Complete Animal Base Fertilizer....	8.00	1.65	5.00
Baugh's Fish Mixture.....	8.00	1.65	2.00
Baugh's Animal Base and Potash Compound for All Crops.....	8.00	1.65	2.00
Baugh's Wheat Fertilizer for Wheat and Grass	8.00	1.65	2.00
Baugh's Southern States Excelsior Guano....	8.00	1.21	3.00
Baugh's Southern States Guano for Bright Tobacco	7.00	2.88	7.00
Baugh's Potato and Truck Special.....	7.00	2.88	7.00
Baugh's Fine Ground Fish.....	6.87	8.23	....
Baugh's 7 Per Cent Potato Guano.....	6.00	5.76	5.00
Baugh's Cabbage Guano.....	6.00	5.76	5.00
Baugh's Peruvian Guano Substitute for Potatoes and All Vegetables.....	6.00	4.12	5.00
Baugh's 5—6—5 Guano.....	6.00	4.12	5.00
Baugh's New Process 10 Per Cent Guano....	5.00	8.23	2.50
Baugh's Special Potato Manure.....	5.00	1.65	10.00
Baugh's Wrapper Leaf Brand for Seed Leaf Tobacco	3.50	3.30	5.00
Baugh's Soluble Top Dresser for All Crops..	....	8.23	3.00
Baugh's Fine Ground Tankage.....	....	7.40	....
Randolph's Bone and Potash Mixture for All Crops	10.00	....	3.00
Hassell's Tobacco Guano.....	9.00	2.26	2.00
Glover's Special Potato Guano.....	7.00	3.30	8.00
Wilson's Special for Tobacco.....	6.00	2.47	6.00
Sulphate of Ammonia.....	....	20.57	....
Nitrate of Soda.....	....	15.23	....
Fine Ground Blood.....	....	13.00	....
Muriate of Potash.....	....	....	48.00
High Grade Sulphate of Potash.....	....	....	48.00
Genuine German Kainit.....	....	....	12.00
M. J. Best & Sons, Goldsboro, N. C.			
Genuine German Kainit.....	....	....	12.00
W. G. Buie Co., Laurinburg, N. C.—			
Nitrate of Soda.....	....	14.85	....
J. A. Benton, Ruffin, N. C.—			
Benton's North Carolina Bright Fertilizer....	9.00	1.65	2.00
Baltimore Fertilizer Co., Baltimore, Md.—			
Honest Acid Phosphate.....	14.00	....	....
Honest Bone and Potash.....	10.00	....	2.00
Honest Sweet Potato Grower.....	8.00	2.40	4.00
Honest Ammoniated Bone.....	8.00	1.60	2.00
Honest Revenue	7.00	2.40	6.00
Honest Success	7.00	.82	4.00
Honest Dixie Trucker.....	6.00	4.00	7.00
Honest Trucker	6.00	4.00	5.00
Blackstone Guano Co., Inc., Blackstone, Va.—			
Blackstone Raw Bone.....Total	20.00	3.60	....
Blackstone Corn Fertilizer.....	10.00	1.03	1.00
Pure Animal Bone.....Total	20.00	3.30	....
B. G. Co., Inc., Acid Phosphate.....	14.00	....	....
B. G. Co., Inc., Bone and Potash.....	10.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
B. G. Co., Inc., Bone and Potash	10.00	....	2.00
Special Compost	11.00	1.03	....
Dissolved Bone	10.00	1.03	1.00
King of Corn Fertilizer	10.00	1.03	1.00
Blackstone Special for Tobacco	9.00	2.47	3.00
Old Bellefonte	8.00	3.30	2.00
King of Tobacco Fertilizer	8.00	3.30	2.00
Tobacco Special	8.00	2.47	3.00
Prize Winner	8.00	2.47	3.00
Wrapper Brand	8.00	2.47	3.00
Jim Crow for Tobacco	8.00	2.47	3.00
Bellefonte	8.00	2.47	2.00
Prize Winner	8.00	2.47	2.00
Hard Cash	8.00	2.06	2.00
Carolina Special for Tobacco	8.00	1.65	4.00
Standard Guano	8.00	1.65	2.00
Red Letter for Tobacco	8.00	1.65	2.00
Alliance for Tobacco	8.00	1.65	2.00
Leader for Tobacco	8.00	1.65	2.00
Peanut Special	8.00	1.03	6.00
John L. Bailey Co., Elm City, N. C.—			
Fairmont Guano	8.00	2.47	3.00
Stag Brand Fertilizer	8.00	1.65	2.00
C. J. Burton Guano Co., Baltimore, Md.—			
Acid Phosphate	14.00	....	....
High Grade Tobacco	8.00	3.29	4.00
Burton's Best	8.00	2.47	3.00
Burton's High Grade	8.00	2.06	3.00
Burton's Butcher Bone	8.00	1.65	2.00
Tobacco Queen	8.00	2.47	3.00
Bradley Fertilizer Co., Charleston, S. C.—			
High Grade Bradley's Dissolved Phosphate	16.00	....	....
High Grade Bradley's Acid Phosphate	14.00	....	....
High Grade Bradley's Potash Acid Phosphate,	10.00	....	4.00
High Grade Bradley's Circle Guano	8.00	3.29	4.00
High Grade Bradley's Guano	8.00	2.46	3.00
Standard Bradley's XXX Acid Phosphate	13.00	....	....
Standard Bradley's Acid Phosphate	12.00	....	....
Standard Bradley's Palmetto Acid Phosphate,	12.00	....	....
Standard Bradley's Wheat Grower	10.00	....	2.00
Standard Bradley's Bone and Potash	10.00	....	2.00
Standard Bradley's Ammoniated Dissolved Bone	9.00	1.85	1.00
Standard Bradley's Patent Superphosphate	9.00	1.85	1.00
Standard Bradley's Cereal Guano	8.00	1.65	2.00
Standard Bradley's X Guano	8.00	1.65	2.00
Standard B. D. Sea Fowl Guano	9.00	1.85	1.00
Standard Eagle Ammoniated Bone Superphosphate	9.00	1.85	1.00
German Kainit	....	....	12.00
The Bryant Fertilizer Co., Alexandria, Va.—			
Bryant's Fine Ground Raw Bone.....Total	22.50	3.70	....
Bryant's S. C. Dissolved Bone	14.00	....	....
Bryant's Bone and Potash Mixture	10.00	....	2.00
Bryant's Bone Mixture for Tobacco	9.00	2.06	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Bryant's "Challenge" Highest Grade Tobacco Mixture	9.00	2.47	3.00
Bryant's "Victor" Tobacco Fertilizer	8.00	2.47	3.00
Bryant's "Otter" Special Tobacco Fertilizer	8.00	2.06	3.00
Bryant's "Potomac" Bone Special for Tobacco,	8.00	1.65	2.00
The Berkley Chemical Co., Norfolk, Va.—			
Pure Ground Bone.....Total	20.00	3.70	....
Resolute Acid Phosphate	16.00	....	....
Berkley Acid Phosphate	14.00	....	....
Berkley Bone and Potash Mixture	11.00	....	2.00
Berkley Plant Food	10.00	....	4.00
Berkley Tobacco Guano	8.00	2.47	3.00
Laurel Potash Mixture	10.00	....	2.00
Monitor Animal Bone Fertilizer	9.00	1.85	4.00
Advance Crop Grower	8.00	2.47	3.00
Select Crop Grower	8.00	2.06	2.50
Brandon Superphosphate	8.00	1.65	2.00
Long Leaf Tobacco Grower	8.00	1.65	2.00
Berkley Peanut and Grain Grower	8.00	1.00	4.00
Superior Bone and Potash	8.00	....	4.00
Mascot Truck Guano	7.00	4.12	5.00
Victory Special Crop Grower	7.00	3.29	4.00
Royal Truck Grower	6.00	5.76	5.00
The Leader of the World	5.00	3.29	5.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Bragaw Fertilizer Co., Washington, N. C.—			
Palmetto Acid Phosphate	14.00	....	....
Long Acre Bone Phosphate	14.00	....	....
Farmers' Union Meal Mixture	9.00	2.26	2.00
Beaufort County Guano	8.00	2.47	3.00
Havana Tobacco Guano	8.00	2.47	3.00
Tuckahoe Tobacco Guano	8.00	2.06	3.00
Old Reliable Premium Guano	8.00	1.65	2.00
Tar Heel Guano	8.00	1.65	2.00
Pamlico Trucker	7.00	4.12	8.00
Riverview Potato Grower	6.00	5.76	5.00
Chocowinity Special Tobacco Guano	5.00	3.29	6.00
Sunrise Tobacco Guano	4.00	2.47	5.00
Genuine German Kainit	....	....	12.00
Conestee Chemical Co., Wilmington, N. C.—			
Conestee 16 Per Cent Acid Phosphate	16.00	....	....
Conestee High Grade Acid Phosphate	14.00	....	....
Conestee High Grade Guano	6.00	4.95	8.00
Conestee Acid Phosphate	13.00	....	....
Conestee Bone and Potash	11.00	....	2.00
Conestee Bone and Potash	10.00	....	2.00
Conestee Bone and Potash	10.00	....	3.00
Conestee Bone and Potash	10.00	....	4.00
Conestee Bone and Potash	8.00	....	4.00
Conestee Cotton Guano	9.00	2.27	2.00
Conestee Cotton Grower	9.00	2.26	2.00
Conestee Melon Grower	8.00	4.22	7.00
Conestee Melon Grower	8.00	4.12	7.00
Conestee P. D. Q. Fertilizer	8.00	3.30	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Conestee P. D. Q. Fertilizer for Tobacco	8.00	3.29	4.00
Conestee Special Fertilizer for Tobacco	8.00	2.47	3.00
Conestee Fertilizer for Tobacco	8.00	2.47	2.50
Conestee Fertilizer	8.00	2.47	2.50
Conestee Crop Guano	8.00	2.06	3.00
Conestee Tobacco Grower	8.00	2.06	3.00
Conestee Complete Fertilizer	8.00	2.06	2.00
Conestee Standard Guano	8.00	1.65	2.00
Conestee Root Crop Guano	7.00	4.10	7.00
Conestee Truck Grower	6.00	3.30	8.00
Conestee Corn Guano	6.00	2.47	3.00
Conestee Special Top Dresser	4.00	8.23	4.00
Conestee Pure German Kainit	....	....	12.00
Conestee Top Dresser	....	7.41	3.00
Nitrate of Soda	....	15.05	....
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
E. W. Brawley, Mooresville, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Leo	8.00	2.47	3.00
16 Per Cent Dried Blood	....	13.17	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Columbia Guano Co., Norfolk, Va.—			
Pure Raw Bone Meal.....Total	21.50	3.71	....
Columbia High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Columbia 14 Per Cent Acid Phosphate	14.00	....	....
Columbia Dissolved Bone	13.00	....	....
Columbia Acid Phosphate	12.00	....	....
Columbia 11 and 5 Bone and Potash Mixture,	11.00	....	5.00
Columbia 10-5 Bone and Potash Mixture	10.00	....	5.00
Columbia 10 and 4 Bone and Potash Mixture,	10.00	....	4.00
Columbia Bone and Potash for Grain	10.00	....	3.00
Columbia Bone and Potash Mixture	10.00	....	2.00
Columbia C. S. M. Special	9.00	2.27	2.00
Columbia Special Truck Guano	8.00	3.30	4.00
Columbia Special 4-8-3	8.00	3.30	3.00
Columbia Special Tobacco Guano	8.00	2.06	2.00
Columbia Special Wheat Fertilizer	8.00	1.65	2.00
Columbia Soluble Guano	8.00	1.65	2.00
Columbia 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Columbia Special 7 Per Cent Truck Guano	7.00	5.77	7.00
Columbia Potato Guano	7.00	4.12	5.00
Columbia Special Top Dresser	4.00	6.18	2.50
Columbia Side Dresser	4.00	8.22	4.00
Columbia Top Dresser	....	7.42	3.00
McRae's Special	9.00	4.12	7.00
McRae's High Grade Guano	8.00	3.30	7.00
Pelican Ammoniated Guano	9.00	3.30	4.00
Roanoke Ammoniated Guano	9.00	1.65	3.00
Carolina Soluble Guano	9.00	1.65	1.00
Trojan Tobacco Guano	8.00	3.30	4.00
Hayes' Special	8.00	3.30	3.00
Olympia Cotton Guano	8.00	2.47	3.00
Hyco Tobacco Guano	8.00	2.47	3.00
Our Best Meal Guano	8.00	2.47	3.00
Spinola Peanut Grower	8.00	1.02	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Crown Brand Peanut Guano	7.00	....	5.00
Crew's Special	5.85	4.49	10.00
Nitrate of Soda	....	15.22	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Cumberland Bone and Phosphate Co., Portland, Me., and Charleston, S. C.—			
Standard Cumberland Bone and Superphosphate of Lime	9.00	1.85	1.00
The Coe-Mortimer Co., Charleston, S. C.—			
Thomas Phosphate Ex. S.S. Richmond..Total	18.00	....	....
Halifax Guano	9.00	2.47	3.00
Maltassa Guano .....Total	4.40	5.26	3.80
Imported Ground Fish Guano, No. 3	2.00	9.03	....
Imported Ground Fish Guano, No. 2	2.00	8.46	....
Imported Ground Fish Guano, No. 1	2.00	8.23	....
High Grade Tankage	2.00	8.22	....
Nitrate of Soda	....	14.76	....
Dried Blood, No. 3	....	14.19	....
Dried Blood, No. 2	....	13.57	....
Dried Blood, No. 1	....	13.16	....
Nitrate of Potash	....	12.30	44.00
Muriate of Potash	....	....	56.00
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Muriate Mixture	....	....	20.00
Genuine German Kainit	....	....	12.00
Combahee Fertilizer Co., Charleston, S. C.—			
Dissolved Bone 16 Per Cent	16.00	....	....
Dissolved Bone 14 Per Cent	14.00	....	....
Dissolved Bone 13 Per Cent	13.00	....	....
Cantaloupe Fertilizer	10.00	2.46	1.00
Melon Fertilizer	10.00	3.30	5.00
K. M. S.	8.00	3.30	4.00
King Cotton	8.00	2.47	4.00
H. G. Cotton	8.00	2.47	3.00
H. G. Cotton	8.00	1.67	2.00
Nitrate of Soda	....	14.83	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Calder Bros., Wilmington, N. C.—			
Nitrate of Soda	....	14.80	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Craven Chemical Co., New Bern, N. C.—			
Jewel Acid Phosphate	14.00	....	....
Trent Bone and Potash	10.00	....	2.00
Halifax Guano	9.00	2.47	3.00
Prolix 9-2-3 Special Guano	9.00	1.65	3.00
Hanover Standard Guano	8.00	3.29	4.00
Duplin Tobacco Guano	8.00	2.47	3.00
Gaston High Grade Fertilizer	8.00	2.47	3.00
C. E. Foy High Grade Guano	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Marvel Great Crop Grower	8.00	2.06	3.00
Elite Cotton Guano	8.00	1.65	2.00
Pantego Potato Guano	7.00	4.12	7.00
Neuse Truck Grower	6.00	4.94	6.00
Craven Chemical Co.'s Truck Guano, 5-10-2½,	5.00	8.24	2.50
Genuine German Kainit	....	....	12.00
William H. Camp, Petersburg, Va.—			
Camp's Acid Phosphate	16.00	....	....
Camp's Acid Phosphate	14.00	....	....
Camp's Shepherd Brand Bone and Potash	10.00	....	4.00
Camp's Bone and Potash	10.00	....	2.00
Camp's Yellow Head Chemicals	8.00	2.87	7.50
Camp's Special for Tobacco	8.00	2.46	3.00
Camp's Red Head Chemicals	8.00	2.25	2.00
Camp's Green Head Chemicals, Irish Potato	7.00	6.15	10.00
Lion and Monkey, 8-2-2	8.00	1.65	2.00
Nitrate of Soda	....	14.75	....
German Kainit	....	....	12.00
Clayton Oil Mill, Clayton, N. C.—			
C. O. M. 16 Per Cent Acid Phosphate	16.00	....	....
C. O. M. 14 Per Cent Acid Phosphate	14.00	....	....
C. O. M. Bone and Potash	12.00	....	5.00
C. O. M. Special Corn Mixture	10.00	....	5.00
C. O. M. Wheat Compound	10.00	2.06	4.50
C. O. M. German Kainit	....	....	12.00
C. W. H. Special	8.00	4.13	5.00
Clayton Guano	8.00	2.47	3.00
Clayton Special Tobacco Grower	8.00	2.47	3.00
Clayton Oil Mill C. O. M. Planters' Favorite,	8.00	2.47	3.00
Cotton Queen	8.00	1.65	2.00
Summer Queen	8.00	1.65	2.00
Perfection Top Dresser	....	9.85	4.00
Cowell, Swan & McCotter Co., Bayboro, N. C.—			
Bone Phosphate	14.00	....	....
Standard Cotton Grower	8.00	3.30	3.00
Champion Guano	8.00	2.47	3.00
Cowell's Great Tobacco Grower	8.00	2.47	3.00
Quick Grower Guano	8.00	2.06	3.00
Rust Proof Cotton Guano	8.00	1.65	3.00
Crop Guano	8.00	1.65	2.00
Great Cabbage and Potato Guano	7.00	5.77	7.00
Oriental Trucker	7.00	4.12	8.00
Aurora Trucker	7.00	4.12	7.00
High Grade Truck Guano	7.00	4.12	5.00
Potato Favorite Guano	7.00	3.30	7.00
Cowell, Swan & McCotter Co.'s Cabbage Guano	5.00	8.25	2.50
German Kainit	....	....	12.00
Chickamauga Fertilizer Works, Atlanta, Ga.—			
Chickamauga High Grade Dissolved Bone, No. 16	16.00	....	....
Chickamauga High Grade Dissolved Bone	14.00	....	....
Chickamauga High Grade Fertilizer	10.00	1.65	2.00
Chickamauga High Grade Plant Food	10.00	1.65	2.00
Chickamauga 13-4	13.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Chickamauga Potash Special, No. 4	12.00	....	4.00
Chickamauga Potash Special	12.00	....	2.00
Chickamauga Dissolved Bone	12.00	....	....
Chickamauga Very Best	10.00	3.30	4.00
Chickamauga Fish Scrap Guano	10.00	1.65	2.00
Chickamauga Wheat Special	10.00	.82	3.00
Chickamauga Corn Special	10.00	.82	3.00
Chickamauga Wheat and Corn Grower, No. 6.	10.00	....	6.00
Chickamauga Wheat and Corn Grower, No. 5.	10.00	....	5.00
Chickamauga Wheat and Corn Grower	10.00	....	4.00
Chickamauga Bone and Potash	10.00	....	2.00
Chickamauga Blood, Bone and Tankage Guano.	9.00	.82	2.00
Chickamauga Complete Fertilizer	8.00	1.65	2.00
Chickamauga Standard Corn Grower	8.00	1.65	2.00
Chickamauga Standard Wheat Grower	8.00	1.65	2.00
Chickamauga Alkaline Bone, No. 6	8.00	....	6.00
Chickamauga Alkaline Bone, No. 5	8.00	....	5.00
Ben Hur H. G. Guano	10.00	2.47	3.00
Old Glory Mixture	10.00	.82	1.00
Special Wheat Compound	10.00	1.65	4.00
Special Wheat Grower	8.00	1.65	6.00
Special Vegetable Compound	10.00	1.65	4.00
Special Vegetable Grower	8.00	1.65	6.00
Special Corn Compound	10.00	1.65	4.00
Special Corn Grower	8.00	1.65	6.00
Georgia Home Guano	8.00	1.65	2.00
No. 3 Bone, Tankage and Potash Mixture	8.00	.82	3.00
Canton Fertilizer Co., Canton, Ga.—			
H. G. Dissolved Bone	16.00	....	....
H. G. Dissolved Bone	14.00	....	....
R. T. Jones Extra H. G.	10.00	2.47	3.00
North Georgia High Grade	10.00	2.06	3.00
Jemco High Grade	10.00	1.65	2.00
Jemco Standard Grade	8.60	1.65	2.00
Southern King High Grade	10.00	1.65	2.00
Southern King Standard Grade	8.00	1.65	2.00
Quickstep Wheat and Grain Grower	10.00	.82	3.00
Special Potash Mixture	10.00	....	4.00
Dissolved Bone and Potash	8.00	....	4.00
Cumbahee Fertilizer Co., Charleston, S. C.—			
Melon Fertilizer	10.00	3.30	5.00
Cantaloupe Fertilizer	10.00	2.46	10.00
Nitrate of Soda	....	14.83	....
The Chesapeake Chemical Co., Baltimore, Md.—			
Prolific Top Dresser	....	7.00	3.50
Caralcigh Phosphate and Fertilizer Works, Raleigh, N. C.—			
16 Per cent Acid Phosphate	16.00	....	....
Climax Dissolved Bone	14.00	....	....
Sterling Acid Phosphate	13.00	....	....
Stable Acid Phosphate	12.00	....	....
Horne & Son's High Grade Bone and Potash	11.00	....	5.00
Special Bone and Potash Mixture	10.00	....	4.00
Morris & Scarboro's Special Bone and Potash.	10.00	....	3.00
Electric Bone and Potash Mixture	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Pacific Tobacco and Cotton Grower	9.00	2.26	2.00
Horne's Best	8.00	2.47	3.00
Eclipse Ammoniated Guano	8.00	2.47	2.00
Planters' Pride	8.00	2.06	3.00
Caraleigh Special Tobacco Guano	8.00	2.06	3.00
Ely Ammoniated Fertilizer	8.00	1.65	2.00
Crown Ammoniated Guano	8.00	1.65	2.00
Comet Guano	8.00	.82	3.00
Buncombe Wheat Grower	8.00	....	4.00
Buncombe Corn Grower	8.00	....	4.00
Caraleigh Top Dresser	3.00	8.24	4.00
Nitrate of Soda	....	15.65	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
W. B. Cooper, Wilmington, N. C.—			
Nitrate of Soda	....	15.76	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Contentnea Guano Co., Wilson, N. C.—			
Contentnea 16 Per Cent Acid	16.00	....	....
High Grade 14 Per Cent Acid	14.00	....	....
Bone and Potash Mixture	10.00	....	4.00
Special Formula Fertilizer	9.00	2.06	5.00
Special Formula	8.00	2.47	6.00
Special Formula 8-4-5	8.00	3.29	5.00
Special Formula for Tobacco	8.00	3.28	7.00
Special Formula Fertilizer	8.00	3.29	4.00
Special Formula for Tobacco	8.00	2.88	5.00
Special Formula	8.00	2.47	4.09
Special Tobacco Formula	8.00	2.06	6.00
Special Formula	8.00	2.05	5.00
Special Formula for Cotton	7.00	2.47	3.25
8-4½-7 for Tobacco	8.00	3.70	7.00
8-4½-7 for Cotton	8.00	3.70	7.00
Howard & Williams' Cotton Special	8.00	2.47	5.00
Pick Leaf	8.00	2.47	3.00
Top Notch	8.00	2.47	3.00
Contentnea Cotton Grower	8.00	2.47	2.50
Contentnea Corn Special	5.00	1.65	5.00
Contentnea Top Dresser	3.00	8.23	5.00
Blood and Bone Cotton Compound	8.00	1.65	2.00
Howard & Williams' Tobacco Special	8.00	2.90	5.00
Whitehead Farm Cotton Grower	6.00	2.47	5.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	50.00
German Kainit	....	....	12.00
Dunn Oil Mills Co., Dunn, N. C.—			
Dunn Oil Mills Hustler	8.00	2.47	3.00
Sampson Cotton Grower	8.00	1.65	2.00
C. P. Dey, Beaufort, N. C.—			
Ground Fish Scrap	6.00	9.37	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Dixie Guano Co., Savannah, Ga.—			
High Grade	10.00	1.85	2.75
High Grade	8.00	3.30	4.00
Phosphoric Acid	16.00	....	....
Phosphoric Acid	14.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
Bone and Potash	8.00	....	4.00
Blood and Bone	9.00	1.64	3.00
Blood, Bone and Potash	8.75	1.64	2.00
Farmers' Favorite H. G. Fertilizer	8.00	2.47	3.00
Standard Grade Fertilizer	8.00	1.64	4.00
Standard Grade	8.00	1.64	2.00
Beats All	9.00	1.64	2.00
Dixie Guano Co., Durham, N. C.—			
Dixie 16 Per Cent Acid Phosphate	16.00	....	....
Dixie 14 Per Cent Acid Phosphate	14.00	....	....
Dixie Champion for Wheat and Corn	10.50	....	1.50
Dixie Star Ammoniated	9.00	1.65	1.00
Dixie Corn Fertilizer	9.00	.82	3.00
Dixie Tobacco Fertilizer	8.00	2.46	3.00
Dixie Cotton Fertilizer	8.00	1.65	2.00
Jeff Davis Special	9.00	2.26	2.00
Radium Brand Guano	8.00	3.28	5.00
Carolina Special Ammoniated	8.00	2.46	3.00
Sulky Plow Brand Guano	8.00	2.46	2.00
Battle's Blood and Bone Fertilizer	8.00	2.05	3.00
Niagara Soluble Bone	8.00	2.05	2.00
Old Plantation Superphosphate	8.00	1.65	2.00
J. L. Everett, Rockingham, N. C.—			
Hard Salts	....	....	16.00
Etiwan Fertilizer Co., Charleston, S. C.—			
Etiwan 16 Per Cent Acid Phosphate	16.00	....	....
Etiwan High Grade Acid Phosphate	14.00	....	....
Etiwan Dissolved Bone	13.00	....	....
Etiwan Acid Phosphate with Potash	11.00	....	1.00
Etiwan Potash Bone	10.00	....	4.00
Etiwan Soluble Bone with Potash	10.00	....	3.00
Etiwan Blood and Bone Guano	9.00	2.06	1.00
Etiwan 9-2-3 Per Cent Ammoniated Fertilizer,	9.00	1.65	3.00
Etiwan Superior Cotton Fertilizer	8.00	3.30	6.00
Etiwan Special Cotton Fertilizer	8.00	3.30	4.00
Etiwan Cotton Compound	8.00	2.47	3.00
Etiwan High Grade Cotton Fertilizer	8.00	2.47	2.00
Etiwan Ammoniated Fertilizer	8.00	1.65	2.00
Etiwan Special Potash Mixture	8.00	....	4.00
Diamond Soluble Bone	13.00	....	....
Plow Brand Acid Phosphate with Potash	11.00	....	1.00
Plow Brand Raw Bone Superphosphate	9.00	2.06	1.00
Plow Brand Ammoniated Dissolved Bone	8.75	1.65	2.00
Plow Brand Special Tobacco Fertilizer	8.00	3.30	4.00
Plow Brand Ammoniated Fertilizer	8.00	1.65	2.00
Diamond Soluble Bone with Potash	10.00	....	2.00
XX Acid Phosphate with Potash	10.00	....	2.00
Special for Cotton	9.00	2.47	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Special Formula for Tobacco	8.00	2.47	5.00
Special Formula	7.00	2.05	6.00
Genuine German Kainit	....	....	12.00
Eastern Cotton Oil Co., Hertford, N. C.—			
Acid Phosphate	16.00	....	....
Mat White Special	8.00	3.30	4.00
Rain-proof Cotton Grower	8.00	2.47	2.00
Perquimans Favorite	8.00	1.65	2.00
Nun-Such Potato Grower	6.00	4.12	7.00
Genuine German Kainit	....	....	12.00
Farmers' Fertilizer Co., Spartanburg, S. C.—			
Phosphoric Acid	16.00	....	....
Phosphoric Acid	14.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
High Grade	10.00	3.30	4.00
High Grade	10.00	1.85	2.75
High Grade	10.00	1.65	2.00
High Grade	8.00	3.30	4.00
Beats All 9-2-2	9.00	1.64	2.00
Blood and Bone	9.00	1.64	3.00
Blood, Bone and Potash	8.75	1.64	2.00
Farmers' Favorite H. G. Fertilizer	8.00	2.47	3.00
Standard Grade Fertilizer	8.00	1.64	4.00
Standard Grade	8.00	1.64	2.00
Bone and Potash	8.00	....	4.00
Farmers Guano Co., Raleigh, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Farmers' Acid Phosphate	13.00	....	....
Farmers' Formula	7.00	2.47	3.25
Farmers' Top Dresser	3.00	8.24	4.00
Special Bone and Potash Mixture	10.00	....	4.00
Century Bone and Potash Mixture	10.00	....	2.00
Golden Grade Guano	8.00	2.47	3.00
Big Crop Guano	8.00	2.06	3.00
Toco Tobacco Guano	8.00	2.06	3.00
State Standard Guano	8.00	1.65	2.00
Special Bone and Potash	8.00	....	4.00
Nitrate of Soda	....	15.65	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Floradora Guano Co., Laurinburg, N. C.—			
Rocky Ford	10.00	2.47	7.00
Humus	10.00	3.29	5.00
Florena	8.00	3.29	4.00
Floradora	8.00	3.29	4.00
Oceola	8.00	2.47	3.00
Rob Roy	8.00	2.47	3.00
Red Raven	8.00	1.65	3.00
Scotland Special	6.40	2.13	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Fremont Oil Mills, Fremont, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Carolina C. S. M. Compound	9.00	2.26	2.00
Fomco	8.00	3.20	4.00
Fremont H. G. Guano	8.00	3.29	4.00
Fremont Oil Mill Co.'s Special for Tobacco	8.00	2.47	5.00
Fremont Tobacco Guano	8.00	2.47	5.00
Fremont Standard Fertilizer	8.00	2.47	3.00
Y. & W. Tobacco Special	8.00	2.47	5.00
Wayne County Standard	8.00	2.47	3.00
Square Deal	8.00	2.47	3.00
Nahunta Special	8.00	2.47	3.00
A. A. Special Formula	8.00	2.06	3.00
Up-to-date	8.00	1.65	2.00
Home Run	8.00	1.65	2.00
Y. & W. Cotton Compound	8.00	1.65	2.00
F. O. M. Co. Corn Mixture	7.50	2.05	3.50
C. O. M. Co. Top Dresser	3.00	7.40	5.00
Nitrate of Soda	....	14.85	....
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
Farmers Cotton Oil Co., Wilson, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
Bonum Acid Phosphate	14.00	....	....
Contentnea Acid Phosphate	13.00	....	....
Washington's Corn Mixture Guano	10.00	.82	5.00
Xtra Good Bone and Potash	10.00	....	2.00
Dean's Special Guano	8.00	3.70	7.00
Regal Tobacco Guano	8.00	2.88	5.00
Newsome's Tobacco Special	8.00	2.47	4.00
J. D. Farrior's Special Guano	8.00	2.47	3.00
Graves' Cotton Grower Guano	8.00	2.47	3.00
Golden Gem Guano	8.00	2.47	3.00
Wilson High Grade Guano	8.00	2.27	2.00
Planters' Friend Guano	8.00	2.06	3.00
Carolina Choice Tobacco Guano	8.00	2.06	3.00
Crop King Guano	8.00	1.65	2.00
Farmers' Special Guano	8.00	1.65	2.00
Rogers' Truck Grower	7.00	5.76	7.00
Wilson Top Dresser	2.00	9.05	4.00
Perfect Top Dresser	2.00	8.23	5.00
Sulphate of Ammonia	....	20.57	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Franklin Cotton Oil and Fertilizer Co., Inc., Franklin, Va.—			
Pretlow & Co.'s H. G. Acid Phosphate	16.00	....	....
Pretlow & Co.'s H. G. Truck Fertilizer	8.00	4.12	5.00
Pretlow & Co.'s Cotton-seed Meal Mixture	8.00	2.47	3.00
Pretlow & Co.'s Champion Guano	8.00	1.65	2.00
Pretlow & Co.'s Peanut Grower	8.00	1.00	4.00
Pretlow & Co.'s Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Griffith & Boyd Co., Baltimore, Md.—			
High Grade Acid Phosphate	14.00	....	....
Ammoniated Bone Phosphate	8.00	1.65	2.00
Spring Crop Grower	6.50	1.65	4.50
Seven Per Cent Guano	5.00	5.77	5.00
Netro Crop Feeder	....	7.40	2.50
Genuine German Kainit	....	....	12.00
Germofert Manufacturing Co., Charleston, S. C.—			
Germofert Patented Standard Cotton Grower	8.00	1.65	2.00
Germofert Patented Special Cotton Grower	6.00	2.47	3.00
Germofert Patented Extra Special Cotton Grower	4.00	3.29	4.00
Germofert Patented Tobacco Grower	2.00	3.29	6.00
R. C. Gilliam, Norfolk, Va.—			
Gilliam's 7 Per Cent Potato Guano	6.00	5.76	7.00
Gilliam's Special Potato Guano	6.00	5.76	6.00
German Kali Works, New York, N. Y.—			
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00
Griffith & Turner Company, Baltimore, Md.—			
H. G. Acid Phosphate	14.00	....	....
Animal Bone Phosphate	10.00	2.06	1.50
Home Fertilizer and Chemical Co., Baltimore, Md.—			
Champion Dissolved Phosphate	16.00	....	....
Home High Grade Acid Phosphate	14.00	....	....
Home Bone and Potash	10.00	....	5.00
Home Alkaline Bone	10.00	....	2.00
Home Ammoniated Bone	9.00	1.65	3.00
Home H. G. Ammoniated Compound	9.00	.82	5.00
Home Standard Guano	8.00	4.12	6.00
Home Potato Special	8.00	1.65	10.00
Home Vegetable Fertilizer	6.00	4.12	6.00
Home Potato Grower	6.00	3.30	4.00
Home Fertilizer	....	5.77	7.00
Boykin's Dissolved Animal Bone	12.00	1.65	....
Everybody's Fertilizer	9.00	.82	2.00
Special C. & C. Compound	8.00	2.48	3.00
Zancey's Formula for Yellow Leaf Tobacco	8.00	2.48	2.00
Phœnix Crop Grower	8.00	2.48	2.00
Matchless Guano	8.00	1.65	4.00
Boykin's Cereal Fertilizer	8.00	1.65	2.00
Ammoniated Bone Manure	7.00	1.65	5.00
Farmers' Choice	7.00	.82	4.00
Truckers' Special Compound	6.00	5.77	5.00
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.27	....
Cerealite Top Dresser	....	7.43	3.00
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Hadley, Harris & Co., Wilson, N. C.—			
Hadley's Special 8-4½-7 Mixture	8.00	3.70	7.00
Hadley's Tobacco and Cotton Special	8.00	2.47	5.00
Hadley Ross Guano	8.00	2.26	2.50
Golden Weed Tobacco Grower	8.00	2.47	3.00
Daisy Fish Mixture	8.00	1.65	2.00
Top dressing	2.00	8.23	5.00
Nitrate of Soda	....	15.60	....
German Kainit	....	....	12.00
Hampton Guano Co., Norfolk, Va.—			
Pure Ground Bone	20.00	3.70	....
Supreme Acid Phosphate	16.00	....	....
Hampton Acid Phosphate	14.00	....	....
Hampton Bone and Potash Mixture	11.00	....	2.00
Hampton Crop Grower	10.00	....	4.00
Hampton Tobacco Guano	8.00	2.47	3.00
Hampton Special Grain and Peanut Fertilizer	8.00	1.00	4.00
Dauntless Potash Mixture	10.00	....	2.00
Arlington Animal Bone Fertilizer	9.00	1.85	4.00
Alpha Crop Grower	8.50	2.06	2.50
P. P. P. (Princess Prolific Producer)	8.00	2.47	3.00
Extra Tobacco Guano	8.00	1.65	2.00
Shirley's Superphosphate	8.00	1.65	2.00
Excelsior Bone and Potash	8.00	....	4.00
Reliance Truck Guano	7.00	4.11	5.00
Little's Favorite Crop Grower	7.00	3.29	4.00
Virginia Truck Grower	6.00	5.76	5.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.60
Genuine German Kainit	....	....	12.00
S. B. Harrell & Co., Inc., Norfolk, Va.—			
Harrell's Acid Phosphate	14.00	....	....
Harrell's Eclipse	9.00	2.26	2.00
Harrell's Champion Cotton and Peanut Grower	8.00	1.65	2.00
Harrell's Truck Guano	6.00	5.76	5.00
M. P. Hubbard & Co., Baltimore, Md.—			
Hubbard's Soluble S. C. Phosphate	16.00	....	....
Hubbard's Havana Special for Tobacco	8.00	2.48	3.00
Hubbard's Celebrated Phosphate for General Use	8.00	1.66	2.00
Hubbard's Cannon Ball	7.00	5.74	7.00
Hubbard's Maryland Special Vegetable Grower	7.00	4.13	5.00
Hubbard's Special Cotton and Corn Fertilizer	7.00	1.65	5.00
Hubbard's 7 Per Cent Bermuda Guano	6.00	5.78	5.00
Nitrate of Soda	....	15.60	....
Ground Fish	....	8.25	....
Muriate of Potash	....	....	50.00
The Hubbard Fertilizer Co., Baltimore, Md.—			
Hubbard's 14 Per Cent Phosphate	14.00	....	....
Hubbard's Special Mixture	10.00	....	4.00
Hubbard's B. and P. Phosphate	10.00	....	2.00
Hubbard's Blood, Bone and Potash	8.00	3.32	7.00
Hubbard's Noxall	8.00	3.32	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Hubbard's Royal Ensign	8.00	2.49	4.00
Hubbard's Yellow Wrapper	8.00	2.49	3.00
Hubbard's Fish Compound	8.00	1.65	3.00
Hubbard's Exchange Guano	8.00	1.65	2.00
Hubbard's Cannon Ball	7.00	5.74	7.00
Hubbard's Southern Leader	7.00	3.32	5.00
Hubbard's 5 Per Cent Royal Seal	6.00	4.15	5.00
Hubbard's New Process Top Dresser	....	7.60	3.00
Hubbard's Pure German Kainit	....	....	12.00
L. Harvey & Son Co., Kinston, N. C.—			
Nitrate of Soda	....	15.00	....
Harby & Co., Sumter, S. C.—			
Nitrate of Soda	....	14.84	....
Muriate of Potash	....	....	48.00
German Kainit	....	....	12.00
Interstate Chemical Co., Charleston, S. C.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Acid Phosphate with Potash	11.00	....	1.00
Acid Phosphate with Potash	10.00	....	4.00
Acid Phosphate with Potash	10.00	....	2.00
Acid Phosphate with Potash	8.00	....	4.00
Complete Fertilizer	9.00	2.06	1.00
Favorite Crop Grower	9.00	1.65	2.00
H. G. Ammoniated Fertilizer	8.00	3.30	4.00
Planters' Preference Guano	8.00	2.47	3.00
Challenge Brand Guano	8.00	2.06	2.00
Ammoniated Guano	8.00	1.64	2.00
Nitrate of Soda	....	14.80	....
Muriate of Potash	....	....	49.00
German Kainit	....	....	12.00
The Imperial Co., Norfolk, Va.—			
Imperial 17 Per Cent Acid Phosphate	17.00	....	....
Imperial H. G. Tennessee Acid Phosphate	16.00	....	....
Imperial High Grade Acid Phosphate	14.00	....	....
Imperial Catawba Wheat Grower	10.00	....	4.00
Imperial Carolina Wheat Mixture	10.00	....	3.00
Imperial Virginia Grain Mixture	10.00	....	2.00
Imperial Bone and Potash	10.00	....	2.00
Imperial Martin County Special Crop Grower,	9.00	2.26	2.00
Imperial Snowflake Cotton Grower	8.00	3.29	4.00
Imperial Tobacco Grower	8.00	3.29	4.00
Imperial Tobacco Grower	8.00	3.29	4.00
Imperial X. L. O. Cotton Guano	8.00	2.47	3.00
Imperial Tobacco Guano	8.00	2.47	3.00
Imperial Yellow Bark Sweet Potato Guano	8.00	2.47	3.00
Imperial F. and B. Cotton Guano	8.00	2.06	3.00
Imperial Bright Tobacco Guano	8.00	2.06	3.00
Imperial Peanut Guano	8.00	1.65	4.00
Imperial Tennessee Tobacco Guano	8.00	1.65	8.00
Imperial Cotton Grower	8.00	1.65	2.00
Imperial Peanut and Corn Guano	8.00	1.65	2.00
Imperial Champion Guano	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Imperial Cisco Soluble Guano	8.00	1.65	2.00
Imperial Standard Premium	8.00	1.65	2.00
Imperial Fish and Bone Grain Grower	8.00	.82	4.00
Imperial Yadkin Wheat Grower	8.00	....	4.00
Imperial 7—7—7 Potato Guano	7.00	5.76	7.00
Imperial High Grade Irish Potato Guano	7.00	4.11	8.00
Imperial Dawson's Cotton Grower	7.00	2.67	2.75
Imperial Roanoke Crop Grower	7.00	2.47	2.00
Imperial Asparagus Mixture	6.00	4.94	7.00
Imperial 5—6—7 Potato Guano	6.00	4.11	7.00
Imperial Williams' Special Potato Guano	6.00	4.11	5.00
Imperial Fish and Bone	6.00	3.29	4.00
Imperial Sweet Potato Guano	6.00	1.65	6.00
Imperial 10 Per Cent Guano	5.00	8.23	2.50
Imperial Special 7 Per Cent for Potatoes	5.00	5.76	5.00
Imperial Special Tobacco Guano	5.00	3.29	9.00
Imperial Laughinghouse Special Tobacco Guano	4.00	3.29	6.00
Imperial Conetoe Cotton Grower	4.00	3.29	4.00
Imperial Cubanola Tobacco Guano	4.00	2.47	5.00
Imperial Top Dresser for Cotton	2.00	8.23	....
Imperial Nitrate of Soda	....	15.00	....
Imperial Muriate of Potash	....	....	49.00
Imperial Manure Salt	....	....	20.00
Imperial Genuine German Kainit	....	....	12.00
R. L. Kirkwood, Bennettsville, S. C.—			
Hard Salts	....	....	16.00
Lister's Agricultural Chemical Works, Newark, N. J.—			
Lister's Standard Pure Bone Superphosphate of Lime	9.00	1.65	2.00
Lister's Ammoniated Dissolved Bone Phosphate	8.00	2.06	2.00
Lister's Success Fertilizer	8.00	1.65	2.00
A. S. Lee & Sons Co. (Inc.), Richmond, Va.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Lee's Special Wheat Fertilizer	10.00	....	2.00
Lee's H. G. Bone and Potash	9.00	....	4.00
Lee's Natural Tobacco Grower	8.00	1.64	2.00
John F. McNair, Laurinburg, N. C.—			
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
E. H. & J. A. Meadows Co., New Bern, N. C.—			
Meadows' Diamond Acid Phosphate	14.00	....	....
Meadows' Dissolved Bone and Potash Compound	10.00	....	2.00
Meadows' Lobos Guano	8.00	4.11	5.00
Meadows' Ideal Tobacco Guano	8.00	3.29	4.00
Meadows' Gold Leaf Tobacco Guano	8.00	2.47	3.00
Meadows' Roanoke Guano	8.00	2.05	3.00
Meadows' All Crop Guano	8.00	2.05	2.50
Meadows' Cotton Guano	8.00	1.64	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Meadows' Great Cabbage Guano	7.00	5.76	7.00
Meadows' Great Potato Guano	7.00	4.11	8.00
Meadows' 10 Per Cent Guano	6.00	8.23	2.50
Meadows' German Kainit	....	....	12.00
Diamond Acid Phosphate	16.00	....	....
Brooks' Special Tobacco Grower	8.00	2.47	5.00
Parker's Special Tobacco Guano	8.00	2.47	4.00
Dixon's High Grade Tobacco Guano	8.00	2.47	3.00
Hookerton Cotton Guano	8.00	1.64	2.00
The Miller Fertilizer Co., Baltimore, Md.—			
Miller's 16 Per Cent Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Ground Bone .....Total	13.70	2.47	....
Corn and Peanut Grower	10.50	....	2.25
The Miller Fertilizer Co.'s 10 and 4 Per Cent	10.00	....	4.00
Clinch	10.00	....	2.00
Trucker	8.00	4.12	5.00
No. 1 Potato and Vegetable Grower	8.00	3.71	7.00
Miller's Irish Potato	8.00	3.29	4.00
4 Per Cent Tobacco	8.00	3.29	4.00
Everett's Special Cotton Grower	8.00	3.29	4.00
Standard Phosphate	8.00	2.47	3.00
Standard Potato	8.00	2.47	3.00
Tobacco King	8.00	2.47	3.00
Harmony	8.00	2.06	3.00
Special Tobacco Grower	8.00	1.65	4.00
Potato and Vegetable Guano	8.00	1.65	4.00
Ammoniated Dissolved Bone	8.00	1.65	2.00
Profit	8.00	1.65	2.00
Farmers' Profit	8.00	1.65	2.00
Miller's 7 Per Cent	7.00	5.77	7.00
High Grade Potato	6.00	4.12	7.00
Nitrate of Soda	....	15.05	....
Ground Fish	....	8.23	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00
The Mapes Formula and Peruvian Guano Co., 143 Liberty Street, New York—			
Mapes' Complete Manure, "A" Brand	10.00	2.47	2.50
Mapes' Corn Manure	8.00	2.47	6.00
Mapes' Vegetable or Complete Manure for Light Soils	6.00	4.94	6.00
Mapes' Economical Potato Manure	4.00	3.29	8.00
D. B. Martin Co., Richmond, Va.—			
Pure Ground Bone.....Total	22.00	2.46	....
Raw Bone Meal.....Total	21.00	3.70	....
Animal Bone Potash Compound	16.00	1.65	2.50
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Pure Dissolved Animal Bone	12.00	1.65	2.00
Pure Dissolved Animal Bone	12.00	1.64	....
Potash and Soluble Bone	12.00	....	5.00
Potash and Soluble Bone	12.00	....	3.00
Potash and Soluble Bone	10.00	....	5.00
Potash and Soluble Bone	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Martin's Tobacco Compound	9.00	2.26	2.00
Dissolved Organic Compound	9.00	1.00	2.00
Martin's H. G. Guano	8.75	2.00	2.00
Martin's H. G. Guano	8.75	1.65	2.00
Martin's Cotton Guano	8.00	3.28	4.00
Martin's Red Star Brand	8.00	3.28	4.00
Martin's Blue Ribbon Brand Fertilizer	8.00	3.28	2.00
Martin's Bull Head Fertilizer	8.00	2.46	3.00
Martin's Tobacco Special	8.00	2.46	3.00
Martin's Cotton Guano	8.00	2.06	....
Corn and Cereal Special	8.00	1.65	2.00
Carolina Special for Tobacco	8.00	1.65	2.00
Martin's Carolina Cotton	8.00	1.64	2.00
Old Virginia Favorite	8.00	1.64	2.00
Martin's Special Potato Manure	8.00	1.00	5.00
One-Eight-Four	8.00	1.00	4.00
Martin's Peanut Grower	8.00	1.00	4.00
Gilt Edge Potato Manure	7.00	2.46	10.00
Claremont Vegetable Grower	7.00	2.46	5.00
Martin's Top Dresser	7.00	8.22	2.50
Martin's Animal Organic Compound	8.00	1.64	3.00
Martin's Animal Bone Potato Guano	6.00	4.10	7.00
Martin's 7 Per Cent Guano	6.00	5.74	5.00
Early Truck and Vegetable Grower	6.00	3.28	8.00
Martin's Top Dresser	5.00	8.22	2.50
Nitrate of Soda	....	15.58	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Marietta Fertilizer Co., Atlanta, Ga.—			
Langford's Special Guano	10.00	1.65	4.00
Lion Power Guano	10.00	1.65	2.00
Royal Seal Guano	10.00	1.65	2.00
Cooper's High Grade Guano	10.00	1.65	2.00
Lion H. G. Guano	10.00	1.65	2.00
Lion Crop Producer	10.00	....	4.00
Dissolved Bone and Potash	10.00	....	2.00
Marsh-Lee & Co., Marshville, N. C.—			
Marsh's Acid	16.00	....	....
Marsh's Acid	14.00	....	....
Marsh's Special High Grade	8.00	2.47	3.00
Marsh's Cotton Fertilizer	8.00	1.65	2.00
Marsh's Guano for Corn	8.00	1.65	2.00
The MacMurphy Co., Charleston, S. C.—			
H. G. Acid Phosphate	16.00	....	....
High Grade Acid Phosphate, 14 Per Cent	14.00	....	....
Acid Phosphate	13.00	....	....
Special 9-3-3 Guano	9.00	2.47	3.00
Special Cotton and Corn 8.75-2-3	8.75	1.65	2.00
Special 8-3-3 Guano	8.00	2.47	3.00
Special 8-2-2 Cotton and Corn Guano	8.00	1.65	2.00
Special 8-4-6	8.00	3.29	6.00
Special Cotton 8-4-4	8.00	3.29	4.00
Wilcox & Gibbs Co.'s Manipulated Guano	9.00	2.26	2.00
Nitrate of Soda	....	14.82	....
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
Pure German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Martin & White Co., Norfolk, Richmond and Baltimore—			
Phosphate and Potash	12.00	....	5.00
Phosphate and Potash	12.00	....	3.00
Phosphate and Potash	10.00	....	5.00
Phosphate and Potash	10.00	....	4.00
Phosphate and Potash	10.00	....	2.00
H. G. Cotton and Tobacco Guano	8.00	3.28	4.00
Organic Cotton Grower	8.00	2.46	3.00
Special Peanut Grower	8.00	1.05	4.00
Special Seven Per Cent Trucker	6.00	5.74	5.00
Special Potato Guano	6.00	4.10	7.00
Fish Guano	8.00	1.65	3.00
Fruit Special	8.00	1.65	2.00
Big Crop Grower	8.00	1.65	2.00
Blood, Bone and Potash	7.00	4.10	8.00
Virginia Trucker	6.00	3.38	4.00
Nitrate of Soda	....	15.48	....
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
North Carolina Cotton Oil Co., Wilmington, N. C.—			
Wilmington Mortgage Lifter	9.00	2.27	2.00
Wilmington Prolific Crop Grower	9.00	2.27	2.00
Wilmington's Pride	8.00	4.12	7.00
Wilmington Truck Grower	8.00	3.30	4.00
Wilmington High Grade	8.00	2.47	3.00
Wilmington Standard	8.00	2.47	2.50
Wilmington Tobacco Grower	8.00	2.06	3.00
Wilmington Banner	8.00	1.65	3.00
Wilmington Cotton Grower	8.00	1.65	2.00
Wilmington Special	8.00	1.65	2.00
John's Special	8.00	2.47	4.00
L. P. B. Special	8.00	2.47	3.00
Lewis' Special	8.00	2.47	3.00
Carter's Lifter	8.00	2.47	3.00
Pate's Special	8.00	2.47	2.00
Clark's Special	8.00	1.65	3.00
Nitrate of Soda	....	14.82	....
North Carolina Cotton Oil Co., Raleigh, N. C.—			
Raleigh Standard Guano	8.00	2.26	2.00
North Carolina Cotton Oil Co., Charlotte, N. C.—			
Dixie Standard	8.00	2.48	3.00
Majestic	8.00	1.65	2.00
North Carolina Cotton Oil Co., Henderson, N. C.—			
Henderson Tobacco Fertilizer	9.00	2.47	3.00
Henderson Cotton Grower	8.00	1.65	2.00
Franklin Tobacco Fertilizer	9.00	2.47	3.00
Franklin Cotton Grower	8.00	1.65	2.00
Pride of Vance	9.00	2.47	3.00
Uneedit Tobacco Fertilizer	9.00	2.47	3.00
McKinne Mixture	8.00	2.26	3.25
Brewer's Special	8.00	2.26	2.00
Uneedit Cotton Grower	8.00	1.65	2.00
Vance Cotton Grower	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate Agencies Co., New York, Baltimore, Savannah, Charleston and Norfolk—			
Nitrate of Soda, 95 Per Cent	....	15.65	....
Nitrate of Soda	....	14.85	....
Muriate of Potash	....	....	50.00
Kainit	....	....	12.00
New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
14 Per Cent Acid Phosphate	14.00	....	....
Special Corn and Peanut Grower	11.00	....	2.00
High Grade Bone and Potash	10.00	....	4.00
High Grade Fish Scrap	....	8.25	....
Carteret Bone and Potash	10.00	....	2.00
Oriole Tobacco Grower	8.00	3.30	4.00
Foy's High Grade Fertilizer	8.00	2.47	3.00
Lenoir Bright Leaf Tobacco Grower	8.00	2.47	3.00
Pitt's Prolific Golden Tobacco Guano	8.00	2.47	3.00
Favorite Cotton Grower C. S. M.	8.00	2.27	2.00
Onslow Farmers' Reliance Guano	8.00	2.06	3.00
Jones County Premium Crop Grower	8.00	2.06	3.00
Craven Cotton Guano	8.00	1.65	2.00
Greene County Standard Fertilizer	8.00	1.65	2.00
Dunn's Standard Truck Grower	7.00	5.77	7.00
Ives' Irish Potato Guano	7.00	4.12	7.00
Eureka Tobacco Fertilizer	6.00	3.30	7.00
Pamlico Electric Top Dresser	5.00	8.25	2.50
Sulphate of Ammonia	....	20.62	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.67	....
Dried Blood	....	13.25	....
Muriate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Norfolk Fertilizer Co., Norfolk, Va.—			
Oriana 16 Per Cent Acid Phosphate	16.00	....	....
Oriana 14 Per Cent Acid Phosphate	14.00	....	....
Oriana Wheat Grower	10.00	....	4.00
Oriana Bone and Potash	10.00	....	2.00
Oriana C. S. M. Special	9.00	2.26	2.00
Oriana First Step Tobacco Guano	8.00	3.29	4.00
Oriana Tobacco Guano	8.00	2.47	3.00
Oriana for Cotton	8.00	2.47	3.00
Oriana Cotton Guano	8.00	1.65	2.00
Oriana Crop Grower	8.00	1.65	2.00
Oriana H. G. Tobacco Guano	6.00	3.29	4.00
Whitney High Grade Acid Phosphate	16.00	....	....
Iola Acid Phosphate	13.00	....	....
Shenandoah Wheat Mixture	10.00	....	3.00
Young's Grain Grower	10.00	....	2.00
Mayodan Valley Wheat Grower	8.00	....	4.00
Pine Top Special Crop Grower	5.00	1.65	6.00
Nitrate of Soda Mixture for Top Dressing Cotton	2.00	8.23	....
Genuine German Kainit	....	....	12.00
Navassa Guano Co., Wilmington, N. C.			
Navassa Acid Phosphate	16.00	....	....
Navassa 14 Per Cent Acid Phosphate	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Navassa Dissolved Bone	13.00	....	....
Navassa Acid Phosphate	12.00	....	....
Navassa Special Wheat Mixture	12.00	....	4.00
Navassa Gray Land Mixture	12.00	....	4.00
Navassa Wheat Mixture	10.00	....	2.25
Navassa Wheat and Grass Grower	10.00	....	4.00
Navassa Dissolved Bone with Potash	10.00	....	2.00
Navassa Fish Guano	9.00	2.47	3.00
Navassa Manipulated Guano	9.00	2.26	2.00
Navassa Complete Fertilizer	9.00	1.65	1.00
Navassa Universal Fertilizer	8.50	2.06	1.00
Navassa Special Trucker Guano	8.00	3.30	4.00
Navassa High Grade Tobacco Guano	8.00	2.47	10.00
Navassa Carib Guano	8.00	2.47	10.00
Navassa Blood and Meal Mixture	8.00	2.47	5.00
Navassa High Grade Guano	8.00	2.47	3.00
Navassa Cotton Seed Meal Special 3 Per Cent Guano	8.00	2.47	2.00
Navassa Strawberry Top Dressing	8.00	2.06	4.00
Navassa Guano for Tobacco	8.00	2.06	2.00
Navassa Fruit Growers' Fertilizer	8.00	1.65	6.00
Navassa Dissolved Bone with Potash	8.00	....	4.00
Navassa Grain Fertilizer	8.00	1.65	2.00
Navassa Cotton Seed Meal Guano	8.00	1.65	2.00
Navassa Cotton Fertilizer	8.00	1.65	2.00
Navassa Root Crop Fertilizer	7.00	4.12	7.00
Navassa Creole Guano	6.00	4.12	7.00
Navassa H. G. Top Dresser	4.00	7.82	4.00
Navassa Top Dresser	4.00	6.17	2.50
Maxim Guano	10.00	2.47	2.00
Corona Guano	10.00	1.65	2.00
Osceola Guano	9.00	1.65	3.00
Harvest Queen Fertilizer	9.00	1.65	2.00
Coree Tobacco Guano	8.00	3.29	4.00
Orton Guano	8.00	2.47	4.00
Clarendon Tobacco Guano	8.00	2.47	3.00
Mogul Guano	8.00	2.06	3.00
Ammoniated Soluble Navassa Guano	8.00	2.06	2.00
Brooks' Ammoniated Guano	8.00	2.06	1.50
Harvest King Guano	8.00	1.65	3.00
Clark's Special Cotton-seed Meal Guano	8.00	1.65	3.00
Occoneechee Tobacco Guano	8.00	1 65	2.00
Sulphate of Ammonia	....	20.59	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.82	....
Blood	....	13.15	....
Fish Scrap	....	8.24	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
The Nitrate Agencies Co., Savannah, Ga.—			
Nitrate of Soda, 95 Per Cent	....	15.65	....
The Nitrate Agencies Co., Norfolk, Va.—			
Nitrate of Soda	....	14.85	....
Ocean Fisheries Co., Wilmington, N. C.—			
Fish Scrap	3.40	5.30	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
G. Ober & Sons Co., Baltimore, Md.—			
Pure Raw Bone Meal.....Total	21.00	3.71	....
Ober's High Grade Phosphate.....	16.00	....	....
Ober's Dissolved Bone Phosphate.....	14.00	....	....
Ober's Standard Potash Compound.....	12.00	....	5.00
Ober's Dissolved Animal Bone.....	10.00	2.47	....
Ober's Dissolved Bone, Phosphate and Potash.	10.00	....	2.00
Ober's Special High Grade Fertilizer.....	9.00	2.47	3.00
Ober's Special Ammoniated Dissolved Bone..	9.00	1.65	2.00
Ober's Farmers' Mixture.....	9.00	.82	2.00
Ober's H. G. Fertilizer.....	8.00	3.30	4.00
Ober's Special Compound for Tobacco.....	8.00	2.47	3.00
Ober's Standard Tobacco Fertilizer.....	8.00	1.65	2.00
Ober's Special Cotton Compound.....	8.00	1.65	2.00
Ober's Soluble Ammoniated Superphosphate of Lime	8.00	1.65	2.00
Ober's Stag Guano.....	8.00	.82	4.00
Ober's Acid Phosphate with Potash.....	8.00	....	4.00
Ober's Complete Fertilizer.....	6.00	4.12	6.00
Ober's Special Potash Compound for Tobacco,	6.00	2.47	7.00
Ober's Special Tobacco Bed Fertilizer, 10 Per Cent	4.00	8.25	3.00
Acid Phosphate with Potash.....	10.00	....	4.00
Cooper's Pungo Guano.....	8.00	2.06	2.00
Nitrate of Soda.....	....	15.50	....
Muriate of Potash.....	....	....	48.00
Kainit	....	....	12.00
The Pocomoke Guano Co., Norfolk, Va.—			
Pure Ground Bone.....Total	20.00	3.70	....
Superb Acid Phosphate.....	16.00	....	....
Peerless Acid Phosphate.....	14.00	....	....
Alkali Bone	11.00	....	2.00
Pocomoke Bone and Potash Mixture.....	10.00	....	4.00
Pocomoke Superphosphate	8.50	1.65	2.00
Pocomoke Wheat, Corn and Peanut Manure..	8.00	1.00	4.00
Pocomoke Defiance Bone and Potash.....	8.00	....	4.00
10-2 Potash Mixture.....	10.00	....	2.00
Monticello Animal Bone Fertilizer.....	9.00	1.85	4.00
Cinco Tobacco Guano.....	8.50	2.06	2.50
Electric Crop Grower.....	8.50	1.65	2.00
Garrett's Grape Grower.....	8.00	3.29	10.00
Harvey's' High Grade Monarch.....	8.00	2.47	3.00
Monarch Tobacco Grower.....	8.00	2.47	3.00
C. C. C. (Crescent Complete Compound).....	8.00	1.65	3.00
Pamlico Superphosphate	8.00	1.65	2.00
Standard Truck Guano.....	7.00	4.11	5.00
Faultless Ammoniated Superphosphate.....	7.00	3.29	4.00
Freeman's 7 Per Cent Irish Potato Grower...	6.00	5.76	5.00
Seaboard Popular Trucker.....	6.00	5.76	5.00
Coast Line Truck Guano.....	5.00	8.23	3.00
Smith's Special Formula.....	4.00	3.29	6.00
Nitrate of Soda.....	....	15.00	....
Ground Fish	....	8.23	....
Muriate of Potash.....	....	....	49.00
Genuine German Kainit.....	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Pamlico Chemical Co., Washington, N. C.—			
Pamlico 16 Per Cent Acid Phosphate	16.00	....	....
Pamlico Bone Phosphate	14.00	....	....
Pamlico 8-4-4 Guano	8.00	3.30	4.00
Pamlico High Grade Tobacco Grower	8.00	2.47	5.00
Pamlico Success Guano	8.00	2.47	3.00
Pamlico Bone and Fish Guano	8.00	1.65	2.00
Pamlico Cotton Guano	8.00	1.65	2.00
Pamlico 7-7-7 Guano	7.00	5.77	7.00
Pamlico Special Irish Potato Guano	7.00	4.12	7.00
Pamlico Special Sweet Potato Guano	7.00	4.12	5.00
Pamlico 6-3-6	6.00	2.47	6.00
Pamlico Cereal Side Dresser	2.50	7.42	2.50
Pamlico Ground Fish	....	8.25	....
Dissolved Bone and Potash Compound	10.00	....	2.00
Blount's Special Cotton Grower	9.00	2.27	2.00
Blount's Special Tobacco Grower	8.00	2.47	3.00
Blount's H. G. Potato Grower	7.00	4.12	5.00
Prosperity Cotton Grower	9.00	2.26	2.00
Cowell's Great Potato Grower	8.00	4.12	7.00
Bull's Eye Tobacco Grower	8.00	3.30	4.00
Tobacco Growers' Friend	8.00	2.47	3.00
Staton, Taylor & Mayo's Special Cotton Grower	8.00	2.26	2.00
Farmers' Best Guano	8.00	2.06	3.00
Faulkland H. G. Tobacco Guano	6.00	2.47	6.00
Cowell's Great Cabbage Grower	5.00	8.25	2.50
Acidulated Fish Scrap	5.50	7.82	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Planters Fertilizer and Phosphate Co., Charleston, S. C.—			
Planters' High Grade Acid Phosphate	14.00	....	....
Planters' H. G. Tobacco Fertilizer	8.00	2.47	3.00
Planters' H. G. Top Dresser	4.00	6.18	2.50
Planters' Soluble Bone	13.00	....	....
Planters' Soluble Guano	8.00	2.47	3.00
Planters' Bone and Potash	12.00	....	1.00
Planters' Bone and Potash	10.00	....	2.00
Planters' Bone and Potash	8.00	....	4.00
Planters' Special Meal Mixture	10.00	1.65	2.00
Planters' Special Mixture	9.00	.82	3.00
Planters' Special Mixture	8.00	4.12	5.00
Planters' Special Cotton Fertilizer	8.00	3.29	4.00
Planters' Grain Grower	10.00	.82	3.00
Planters' Acid and Potash	10.00	....	4.00
Planters' Blood, Bone and Fish Guano	9.00	1.65	3.00
Planters' Bright Tobacco Fertilizer	8.00	3.29	4.00
Planters' Cotton and Corn Fertilizer	8.00	2.47	4.00
Planters' Fertilizer	8.00	2.06	2.00
Planters' Standard Fertilizer	8.00	1.65	2.00
Planters' Muriate of Potash	....	....	48.00
Planters' German Kainit	....	....	12.00
Excelsior H. G. Acid Phosphate	14.00	....	....
Special Mixture	8.00	3.29	6.00
Nitrate of Soda	....	14.83	....
Sulphate of Potash	....	....	48.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Peruvian Guano Corporation, Charleston, S. C.—			
Peruvian Guano, Ex. S.S. Celia.....Total	18.00	2.88	3.25
Peruvian Guano, Ex. S.S. Chipana.....Total	12.00	4.58	2.50
Peruvian Guano, S.S. Chipana.....Total	12.00	2.88	2.00
Peruvian Guano, Ex. S.S. Chipana.....Total	12.00	2.88	2.00
Peruvian Guano, Ex. S.S. Chipana.....Total	11.50	5.96	2.75
Peruvian Guano, Ex. S.S. Chipana.....Total	11.00	5.76	2.50
Peruvian Top Dresser.....Total	8.00	7.00	3.50
16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
13 Per Cent Acid Phosphate.....	13.00	....	....
12 Per Cent Acid Phosphate.....	12.00	....	....
S. S. Chipana.....Total	14.00	3.29	2.00
S. S. Condon.....Total	14.00	2.46	2.00
S. S. Capac.....Total	13.00	4.93	2.25
Sulphate of Ammonia.....	....	20.56	....
Sulphate of Potash.....	....	....	48.00
Nitrate of Soda.....	....	14.80	....
Dried Blood	....	13.16	....
Fish Scrap	....	8.22	....
Muriate of Potash.....	....	....	49.00
Kainit	....	....	12.00
Pearsall & Co., Wilmington, N. C.—			
H. G. Acid Phosphate.....	16.00	....	....
H. G. Acid Phosphate.....	14.00	....	....
High Grade Tobacco.....	8.00	2.47	3.00
Pearsall's Bone and Potash.....	10.00	....	4.00
Pearsall's Berry Guano	8.00	2.47	10.00
Pearsall's Potato and Truck Guano.....	6.00	4.12	7.00
Pearsall's Top Dresser.....	....	7.42	3.00
Fish and Potash Compound.....	8.00	3.29	4.00
Bone Meal and Fish.....Total	8.00	3.29	4.00
F. F. F. G.....	8.00	2.47	3.00
Corn Guano	8.00	1.65	3.00
Eagle	8.00	1.65	2.00
Fernside	6.00	4.12	7.00
Nitrate of Soda.....	....	14.25	....
Sulphate of Potash.....	....	....	48.00
Muriate of Potash.....	....	....	48.00
Genuine German Kainit.....	....	....	12.00
Pacific Guano Co., Charleston, S. C.—			
Standard Pacific Acid Phosphate.....	12.00	....	....
Standard Soluble Pacific Guano.....	8.50	1.65	2.00
High Grade Pacific Fertilizer.....	8.00	2.46	3.00
Powhatan Chemical Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	20.00	3.29	....
Magic Dissolved Bone Phosphate.....	16.00	....	....
Magic Corn Grower.....	10.00	.82	1.00
Magic Crop Grower.....	10.00	.82	1.00
Magic Bone and Potash Mixture.....	10.00	....	4.00
Magic Mixture	9.00	1.65	1.00
Magic Wheat Grower.....	9.00	.82	2.00
Magic Fertilizer	8.00	2.47	4.00
Magic Cotton Grower.....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Magic Special Fertilizer	8.00	1.65	2.00
Magic Tobacco Grower	8.00	1.65	2.00
Magic Peanut Special	8.00	.82	4.00
Magic Peanut Grower	8.00	....	4.00
Magic Grain and Grass Grower	8.00	....	4.00
High Grade Acid Phosphate	14.00	....	....
High Grade Bone and Potash Mixture	12.00	....	5.00
Powhatan Acid Phosphate	13.00	....	....
Powhatan Special Fertilizer	9.00	1.65	2.00
Powhatan Bone and Potash Mixture	8.00	....	4.00
Powhatan Trucker	7.00	4.94	5.00
Virginia Dissolved Bone	12.00	....	....
Bone and Potash Mixture	10.00	....	2.00
Guilford Special Tobacco Fertilizer	9.00	2.47	6.00
Economic Cotton Grower	9.00	2.26	2.00
Johnson's Best Fertilizer	9.00	2.06	5.00
Johnson's Special Fertilizer	8.00	2.47	3.00
Holt's Magic Fertilizer	9.00	2.06	5.00
King Trucker	8.00	4.11	5.00
King Brand Fertilizer	8.00	2.06	3.00
North State Special	8.00	3.29	4.00
P. C. Co.'s Hustler	8.00	2.47	3.00
White Leaf Tobacco Fertilizer	8.00	2.06	3.00
Sulphate of Ammonia	....	19.75	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Pure German 16 Per Cent Potash Salts	....	....	16.00
Pure German Kainit	....	....	12.00
Pine Level Oil Mill Co., Pine Level, N. C.—			
Pine Level 14 Per Cent Acid Phosphate	14.00	....	....
Pine Level High Grade	8.00	2.47	3.00
Sutton's Potato Guano	9.00	2.88	5.00
Oliver's Truck Grower Guano	8.00	3.30	4.00
Hale's Special for Tobacco	8.00	2.47	4.00
Cotton Grower for All Crops	8.00	1.65	2.00
H. G. Top Dresser	3.00	6.03	6.00
Nitrate of Soda	....	15.22	....
Muriate Potash	....	....	48.00
Patapsco Guano Co., Baltimore, Md.—			
Patapsco Pure Ground Bone.....Total	20.59	3.70	....
Patapsco Pure Dissolved S. C. Phosphate	14.00	....	....
Patapsco High Grade Phosphate and Potash	11.00	....	5.00
Patapsco 10 and 4 Potash Mixture	10.00	....	4.00
Patapsco Soluble Bone and Potash	10.00	....	2.00
Patapsco Guano for Tobacco	9.25	2.06	2.00
Patapsco Guano	9.25	2.06	2.00
Patapsco Tobacco Fertilizer	9.00	2.47	3.00
Patapsco Cotton and Tobacco Special	8.00	3.29	4.00
Patapsco Plant Food for Tobacco, Potatoes and Truck	8.00	2.47	5.00
Patapsco Special Tobacco Mixture	8.00	2.06	3.00
Patapsco 7-7-7 Truck Guano	7.00	5.76	7.00
Patapsco Trucker for Early Vegetables	7.00	4.11	5.00
Patapsco Potato Guano	6.00	4.11	7.00
Patapsco Crop Dresser	4.00	3.30	4.00
Patapsco Crop Dresser	4.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Sulphate of Ammonia	....	19.75	....
Florida Soluble Phosphate	16.00	....	....
Baltimore Soluble Phosphate	11.00	....	2.00
Coon Brand Guano	9.00	.82	3.00
Choctaw Guano	8.00	2.47	3.00
Unicorn Guano	8.00	2.06	3.00
Swanson's Gold Leaf Special	8.00	2.06	2.00
Planters' Favorite	8.00	1.65	2.00
Seagull Ammoniated Guano	8.00	1.65	2.00
Grange Mixture	8.00	1.65	2.00
Money Maker Guano	7.00	3.70	6.00
Nitrate of Soda	....	15.00	....
Ground Fish	....	8.23	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00
Pocahontas Guano Co., Lynchburg, Va.—			
Fine Ground Bone Meal.....Total	23.00	2.47	....
Pure Raw Bone Meal.....Total	22.00	3.71	....
Carrington's S. C. Phosphate, Waukesha Brand	16.00	....	....
Imperial Dissolved S. C. Phosphate	14.00	....	....
Wabash Wheat Mixture	10.00	....	4.00
Carrington's Superior Grain Compound	10.00	....	2.00
Pocahontas Special Tobacco Fertilizer	9.00	2.47	3.00
High Grade 4 Per Cent Tobacco Compound, Mohawk King	9.00	1.85	4.00
Yellow Tobacco Special	9.00	1.65	2.00
Standard Tobacco Guano, Old Chief Brand	9.00	1.65	2.00
Indian Tobacco Grower	8.00	2.47	4.00
Farmers' Favorite Apex Brand	8.00	2.47	3.00
Special Truck Grower, Eagle Mount Brand	8.00	2.06	6.00
Spot Cash Tobacco Compound	8.00	2.06	3.00
Carrington's Banner Brand Guano	8.00	1.65	2.00
A. A. Complete Champion Brand	8.00	1.03	3.00
Cherokee Grain Special	8.00	....	4.00
Planters Cotton Seed Oil Co., Rocky Mount, N. C.—			
Royal Cotton Grower	9.00	2.20	2.00
Tar River Special	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Tobacco Guano	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Cotton Guano	8.00	1.65	2.00
Eagle Guano	8.00	1.65	2.00
Braswell's Special for Tobacco	7.00	2.26	3.50
E. L. D. Special	6.50	2.47	3.00
Planters' Top Dresser	3.50	7.84	3.00
Piedmont-Mt. Airy Guano Co., Baltimore, Md.—			
Piedmont Bone Meal.....Total	21.00	3.29	....
Piedmont Bone and Peruvian Mixture	8.00	1.65	2.00
Piedmont High Grade S. C. Bone Phosphate	14.00	....	....
Piedmont High Grade Ammoniated Bone and Potash	8.00	2.47	3.00
Piedmont High Grade Guano for Cotton	8.00	2.47	3.00
Piedmont Special Potash Mixture	10.00	....	5.00
Piedmont Special Farmers' Tobacco Guano	8.40	2.47	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Piedmont Special for Cotton, Corn and Peanuts	8.00	1.65	2.00
Piedmont Special Truck	6.00	5.76	5.00
Piedmont Special Potato Guano	6.00	4.94	7.00
Piedmont Farmers' Bone and Potash	10.00	....	2.00
Piedmont Farmers' Standard	9.00	1.65	2.00
Piedmont Farmers' Cotton Grower	9.00	.82	3.00
Piedmont Farmers' Favorite	8.00	.82	4.00
Piedmont Essential Tobacco Compound	9.00	1.65	2.00
Piedmont Raw and Dissolved Bone Compound	9.00	1.00	2.00
Piedmont Unexcelled Guano	8.00	3.29	4.00
Piedmont Guano for Tobacco	8.00	2.06	3.00
Piedmont Guano for All Crops	8.00	2.06	3.00
Piedmont Red Leaf Tobacco Guano	8.00	1.65	2.00
Piedmont Cultivator Brand	8.00	1.65	2.00
Piedmont Guano for Wheat	8.00	1.65	....
Piedmont Star Bone and Potash	8.00	....	5.00
Piedmont's 7-7-7 Truck Guano	7.00	5.76	7.00
Piedmont 5-7-5 Guano	7.00	4.12	5.00
Piedmont Early Vegetable Manure	6.00	4.12	7.00
Piedmont Early Trucker	6.00	4.12	5.00
Piedmont Vegetable Compound	6.00	3.29	8.00
Piedmont Potato Producer	5.00	2.47	6.00
Levering's Potashed Bone	10.00	....	4.00
Levering's Ammoniated Bone	9.00	.82	3.00
Levering's Reliable Tobacco Guano	8.00	2.47	3.00
Levering's Standard	8.00	1.65	3.00
Stowe Brothers' Select	8.00	3.29	4.00
Salsbury's H. G. Ammoniated Guano	8.00	2.47	3.00
Salsbury's Special for Cotton, Corn and Peanuts	8.00	1.65	2.00
Hunter & Dunn's Special Guano	8.00	2.47	3.00
Hunter & Dunn's Ammoniated Fertilizer	8.00	1.65	2.00
Bailey's Buck Brand	8.00	1.65	2.00
Haynes' Cultivator Brand Guano	8.00	1.65	2.00
Sulphate of Ammonia	....	20.58	....
Sulphate of Potash	....	....	50.00
Nitrate of Soda	....	15.23	....
Boykin's Top Dresser	....	7.41	3.00
Muriate of Potash	....	....	48.00
The Quinnepiac Co., Charleston, S. C.—			
Standard Quinnepiac Acid Phosphate	13.00	....	....
Standard Quinnepiac Pine Island Ammoniated Superphosphate	9.00	1.85	1.00
The Robertson Fertilizer Co., Norfolk, Va.—			
Robertson's Raw Bone Meal.....Total	20.00	3.71	....
Robertson's Soluble H. G. Guano	8.00	2.47	4.00
Robertson's X-(T) Tobacco Grower	8.00	2.06	2.00
Robertson's 5-6-7	6.00	4.13	7.00
Robertson's 7 Per Cent for Truck	5.00	5.78	5.00
Robertson's 10 Per Cent Truck Guano	2.00	8.25	2.00
High Peak Acid Phosphate	16.00	....	....
Scepter Brand Acid Phosphate	14.00	....	....
J. W. S. Special Bone and Potash Mixture	12.00	....	5.00
J. W. S. Alkaline Bone	10.00	....	5.00
Skyscraper Bone and Potash Compound	10.00	....	4.00
Level Run Dissolved Bone and Potash	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Dodson's Choice H. G. Complete Manure	9.00	2.47	3.00
Beaver Brand Soluble Guano	9.00	1.85	4.00
Beaver Brand Soluble Tobacco Guano	9.00	1.85	4.00
Beaver Brand Bright Tobacco Special	9.00	1.85	4.00
P. M. C. High Grade Soluble Guano	8.00	4.12	7.00
Wood's Winner H. G. Guano	8.00	3.30	4.00
Big Cropper High Grade Guano	8.00	2.47	3.00
Double Dollar Soluble Guano	8.00	1.65	2.00
Double Dollar Soluble Cotton Grower	8.00	1.65	2.00
Double Dollar Soluble Tobacco Guano	8.00	1.65	2.00
Ten Strike Soluble Crop Producer	8.00	1.00	4.00
M. C. Special Bone and Potash Mixture	8.00	....	4.00
Nitrate of Soda	....	14.85	....
Dried Blood	....	13.20	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
F. S. Royster Guano Co., Norfolk, Va.—			
Pure Raw Bone Meal.....Total	21.50	3.71	....
Royster's H. G. 17 Per Cent Acid Phosphate	17.00	....	....
Royster's H. G. 16 Per Cent Acid Phosphate	16.00	....	....
Royster's 14 Per Cent Acid Phosphate	14.00	....	....
Royster's Dissolved Bone	13.00	....	....
Royster's XX Acid Phosphate	12.00	....	....
Royster's Bone and Potash Mixture	11.00	....	5.00
Royster's Bone and Potash for Grain	10.00	....	3.00
Royster's Bone and Potash Mixture	10.00	....	2.00
Royster's Soluble Guano	10.00	1.65	2.00
Royster's 10-5 Bone and Potash Mixture	10.00	....	5.00
Royster's 10 and 4 Bone and Potash Mixture	10.00	....	4.00
Royster's 4-9-5 Special	9.00	3.30	5.00
Royster's Meal Mixture	9.00	2.26	2.00
Royster's Cotton Grower	9.00	2.26	2.00
Royster's Special 1-9-2 Guano	9.00	.82	2.00
Royster's Special 4-8-3	8.00	3.30	3.00
Royster's Special Sweet Potato Guano	8.00	2.47	3.00
Royster's Special Wheat Fertilizer	8.00	1.65	2.00
Royster's Special 7 Per Cent Truck Guano	7.00	5.77	7.00
Royster's Special 10 Per Cent Truck Guano	5.00	8.24	3.00
Royster's Special Top Dresser	4.00	6.18	2.50
Royster's Best Guano	8.00	3.71	7.00
Royster's Complete Guano	8.00	1.65	2.00
Royster's 8 and 4 Bone and Potash Mixture	8.00	....	4.00
Royster's Early Truck Guano	7.00	4.12	8.00
Royster's Peanut Special	7.00	....	5.00
Royster's Irish Potato Guano	6.00	4.12	7.00
Royster's 2-6-5 Special	6.00	1.65	5.00
Royster's Cabbage Guano	5.00	8.23	2.50
Royster's Potato Guano	5.00	4.94	7.00
Royster's 4-6-4 Special	4.00	4.94	4.00
Tomlinson's Special	9.00	2.47	5.00
Watkins' Special	9.00	2.06	5.00
Haynes' Special	9.00	2.06	3.00
Viking Ammoniated Guano	9.00	1.65	3.00
Special Compound	9.00	1.65	1.00
Cobb's High Grade for Tobacco	8.00	3.30	5.00
Trucker's Delight	8.00	3.30	4.00
Milo Tobacco Guano	8.00	3.30	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Jupiter High Grade Guano	8.00	3.30	4.00
Black Wrapper Special Tobacco Guano	8.00	3.30	2.00
Eagle's Special Tobacco Guano	8.00	2.47	5.00
Bonanza Tobacco Guano	8.00	2.47	3.00
Marlborough High Grade Cotton Guano	8.00	2.47	3.00
Williams' Special Guano	8.00	2.06	5.00
Orinoco Tobacco Guano	8.00	2.06	3.00
Special Tobacco Compound	8.00	2.06	2.00
Corbett & Moore's Special	8.00	1.65	3.50
Farmers' Bone Fertilizer	8.00	1.65	2.00
Webb's Korn King	8.00	1.65	2.00
Farmers' Bone Fertilizer for Tobacco	8.00	1.65	2.00
Jumbo Peanut Grower	8.00	1.02	4.00
Royal Special Potato Guano	7.00	4.12	7.00
Royal Potato Guano	7.00	4.12	5.00
Ballentine's Potato Guano	6.00	5.77	7.00
Arrow Potato Guano	6.00	5.77	5.00
Oakley's Special Tobacco Guano	6.00	3.30	4.00
McDowell's Cotton Grower	6.00	3.30	2.00
Humphrey's Special for Tobacco	6.00	2.55	3.20
Wiggins' Special	5.50	3.30	3.00
Harvey's Cabbage Guano	5.00	6.59	3.00
Phillips' Special	5.00	1.65	6.00
Presto Top Dresser	4.00	8.22	4.00
Dry Fish .....Total	3.50	8.64	....
Nitrate of Soda	....	15.22	....
Magic Top Dresser	....	7.42	3.00
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Genuine German Kamit	....	....	12.00
Rowe Brothers & Sons Co., Inc., Hampton, Va.—			
Crab Scrap.....Total	3.25	5.33	....
J. H. Roberson & Co., Robersonville, N. C.—			
Roberson's Cotton Grower	9.00	2.26	2.00
Roberson's Special for Bright Tobacco	8.00	2.06	3.00
Roberson's Special Potato Grower	7.00	5.77	7.00
Roberson's Potato Guano	6.00	5.77	5.00
Richmond Guano Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	20.00	3.29	....
Rex Dissolved Bone Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
High Grade Wheat and Grass Fertilizer	14.00	....	....
Premium Bone and Potash Mixture	13.00	....	3.00
Premium Dissolved Bone	13.00	....	....
Premium Corn Grower	10.00	.82	1.00
Premium Cotton Grower	9.00	.82	3.00
Premium Wheat Grower	9.00	.82	2.00
Premium Tobacco Fertilizer	8.00	1.65	2.00
Premium Brand Fertilizer	8.00	1.65	2.00
Premium Peanut Special	8.00	.82	4.00
Premium Peanut Grower	8.00	....	4.00
Hunter & Dunn's Dissolved Bone	13.00	....	....
Hunter & Dunn's Special Ammoniated Fertilizer	9.00	2.47	2.25
Hunter & Dunn's Ammoniated Fertilizer	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
H. G. Bone and Potash Mixture	12.00	....	5.00
Old Homestead Dissolved Bone	12.00	....	....
Dissolved S. C. Phosphate	12.00	....	....
Bone Mixture	10.00	.82	1.00
Rex Bone and Potash Mixture	10.00	....	4.00
Bone and Potash Mixture	10.00	....	2.00
Bone Mixture	9.00	1.65	1.00
Sanders' Special Formula for Bright Tobacco,	9.00	2.88	5.00
Rollings' Special Fertilizer	9.00	2.47	2.00
Collins' Special Fertilizer	9.00	2.47	2.00
Carolina Cotton Grower	9.00	2.26	2.00
Burton's Special Tobacco Fertilizer	9.00	2.06	3.00
Lowery's Special Fertilizer	9.00	1.65	3.00
Cracker Jack Fertilizer	9.00	1.65	2.00
Southern Trucker	8.00	4.11	5.00
Perfection Special	8.00	3.29	4.00
Carolina Bright Tobacco Fertilizer	8.00	2.47	3.00
Gilt Edge Fertilizer	8.00	2.47	3.00
Carolina Bright Special Tobacco Fertilizer	8.00	2.26	2.50
Tip Top Fertilizer	8.00	2.06	3.00
Carolina Bright for Cotton	8.00	2.06	1.50
Special Premium Brand for Tobacco	8.00	1.85	2.25
Special Premium Brand for Plants	8.00	1.85	2.25
Special High Grade for Truck	7.00	4.94	5.00
Benson's Favorite Fertilizer	8.00	1.65	10.00
Beeson's Special Fertilizer	8.00	1.65	6.00
Rex Tobacco Fertilizer	8.00	1.65	4.00
Parker & Hunt's Special Tobacco Fertilizer	8.00	1.65	2.00
Parker & Hunt's Special Fertilizer	8.00	1.65	2.00
Parker & Hunt's Corn Fertilizer	8.00	.82	3.00
Edgecombe Cotton Grower	8.00	1.65	2.00
Tip Top Bone and Potash Mixture	8.00	....	4.00
Winter Grain and Grass Grower	8.00	....	4.00
Clark's Special Formula	7.00	4.94	6.00
10 Per Cent Cabbage Guano	6.00	8.23	2.00
Carter's Special for Tobacco	4.00	2.47	6.00
Smith's Special Fertilizer	4.00	1.65	7.00
Sulphate of Ammonia	....	19.75	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Pure German Kainit	....	....	12.00
Red Cross Guano Co., Lynchburg, Va.—			
Red Cross Bone Meal.....Total	22.00	3.00	....
Red Cross Bone and Potash	10.00	....	2.00
Red Cross Standard Phosphate	14.00	....	....
Red Cross H. G. Phosphate	16.00	....	....
Red Cross Grain Grower	10.00	....	4.00
Red Cross for Tobacco and Truck	9.00	1.85	4.00
Red Cross for Bright Tobacco	9.00	1.65	2.00
Red Cross Special for Tobacco	8.00	2.47	3.00
Red Cross Tobacco Guano	8.00	2.06	3.00
Red Cross Crop Grower	8.00	1.65	2.00
Raisin-Monumental Co., Baltimore, Md.—			
Raisin 16 Per Cent Acid Phosphate	16.00	....	....
Raisin 14 Per Cent Acid Phosphate	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Raisin 13 Per Cent Acid Phosphate	13.00	....	....
Raisin Special Bone and Potash	10.00	....	5.00
Raisin's 10-4 Bone and Potash	10.00	....	4.00
Raisin Bone and Potash	10.00	....	2.00
Raisin Dixie Guano	9.00	1.65	2.00
Raisin Gold Standard	8.00	2.47	3.00
Raisin's Indian Brand for Tobacco	8.00	2.47	3.00
Raisin's General Tobacco Grower	8.00	2.06	3.00
Raisin Empire Guano	8.00	1.65	2.00
Baltimore Special Mixture	9.00	.82	2.00
Read Phosphate Co., Charleston, S. C.—			
Read's H. G. Dissolved Bone	16.00	....	....
Read's H. G. Acid Phosphate	14.00	....	....
Read's H. G. Guano	8.00	3.30	4.00
Read's H. G. Tobacco Leaf	8.00	2.47	3.00
Read's H. G. Cotton Grower	8.00	2.47	3.00
Read's Bone and Potash	10.00	....	4.00
Read's Alkaline Bone	10.00	....	2.00
Read's Manipulated Guano	9.00	1.65	3.00
Read's Ammoniated Dissolved Bone	8.00	3.30	6.00
Read's Soluble Fish Guano	8.00	1.65	2.00
Read's Blood and Bone Fertilizer	8.00	1.62	2.00
Read's Special Potash Mixture	8.00	....	4.00
German Kainit	....	....	12.00
Reidsville Fertilizer Co., Reidsville, N. C.—			
Reidsville Acid Phosphate	16.00	....	....
Bone and Potash	10.00	....	4.00
Bone and Potash	10.00	....	2.00
Bone and Potash	8.00	....	4.00
Lion Brand Fertilizer	9.00	2.47	6.00
Reidsville Hustler	9.00	.82	2.00
Royal Fertilizer	8.00	2.47	3.00
Climax Fertilizer	8.00	2.06	3.00
Broad Leaf Tobacco Guano	8.00	1.85	2.50
Banner Fertilizer	8.00	1.65	2.00
Champion Guano	8.00	1.65	2.00
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
Swift Fertilizer Works, Atlanta, Ga., and Wilmington, N. C.—			
Swift's Pure Bone Meal.....Total	25.00	2.47	....
Swift's Pure Raw Bone Meal.....Total	23.00	3.71	....
Swift's Pure Nitrate of Soda	....	14.82	....
Swift's Special High Grade Acid Phosphate	16.00	....	....
Swift's Special High Grade Phosphate and Potash	12.00	....	6.00
Swift's Special High Grade Guano	9.50	4.12	3.00
Swift's Special Blood Guano for Cotton or Tobacco, H. G.	8.00	2.06	3.00
Swift's Special Peanut Grower Standard Grade Guano	8.00	.82	4.00
Swift's Special Trucker H. G.	6.00	5.76	5.00
Swift's Special Potato Grower H. G. Guano	6.00	4.12	7.00
Swift's Cultivator High Grade Acid Phosphate,	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Harrow Standard Grade Acid Phosphate	13.00	....	....
Swift's Atlanta High Grade Phosphate and Potash	12.00	....	4.00
Swift's Chattahoochee Standard Grade Acid Phosphate	12.00	....	....
Swift's Farmers' Home High Grade Phosphate and Potash	10.00	....	4.00
Swift's Corn and Cotton Grower H. G. Guano,	10.00	2.47	3.00
Swift's Eagle High Grade Guano	10.00	1.65	2.00
Swift's Plow Boy Guano	10.00	.82	1.00
Swift's Field and Farm Standard Grade Phosphate and Potash	10.00	....	2.00
Swift's Wheat Grower Standard Grade Phosphate and Potash	10.00	....	2.00
Swift's Blood, Bone and Potash High Grade Guano	9.50	3.29	7.00
Swift's Cotton King High Grade Guano	9.00	2.47	2.00
Swift's Cotton Plant Standard Grade Guano	9.00	1.65	1.00
Swift's Farmers' Favorite High Grade Guano,	9.00	1.65	3.00
Swift's Cape Fear Truck Guano, H. G.	8.00	4.12	2.00
Swift's Monarch H. G. Guano Vegetable Grower	8.00	3.29	4.00
Swift's Strawberry Grower H. G. Guano	8.00	2.47	10.00
Swift's Carolina Tobacco Grower H. G. Guano,	8.00	2.47	3.00
Swift's Ruralist High Grade Guano	8.00	2.47	3.00
Swift's Pioneer High Grade Guano Tobacco Grower	8.00	1.65	2.00
Swift's Red Steer Standard Grade Guano	8.00	1.65	2.00
Swift's Golden Harvest Standard Grade Guano	8.00	1.65	2.00
Swift's Plantation Standard Grade Phosphate and Potash	8.00	....	4.00
Swift's Carolina 7 Per Cent Special Trucker H. G. Guano	7.00	5.76	7.00
Swift's Special Irish Potato Grower H. G. Guano	7.00	4.12	8.00
Swift's Early Trucker H. G. Guano	7.00	4.12	5.00
High Grade Swift's No. 1 Ground Tankage	6.00	8.24	....
Swift's Favorite Truck Guano H. G.	6.00	4.94	6.00
Swift's Special 10 Per Cent Blood and Bone Trucker H. G. Guano	5.00	8.23	3.00
Swift's Excelsior Top Dresser H. G. Guano	4.00	6.18	2.00
Swift's Ground Dried Blood	....	13.18	....
Swift's Muriate of Potash	....	....	50.00
Swift's German Kainit	....	....	12.00
Southern Chemical Co., Inc., Roanoke, Va.—			
Southern Queen	8.00	2.47	10.00
Success	8.00	2.47	3.00
Valley Queen	8.00	1.65	10.00
Farmers' Joy	8.00	1.65	4.00
Our Favorite	8.00	1.65	2.00
Spartanburg Fertilizer Co., Spartanburg, S. C.—			
Tiger Brand Acidulated Phosphate	14.00	....	....
West's Potash Acid	13.00	....	3.00
Gosnell's Plant Food	10.50	2.46	2.00
Corn Formula	10.50	1.65	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
N. C. Special	10.50	1.65	8.00
Dana's Best	10.00	....	4.00
Melrose	10.00	....	2.00
Boll Buster	9.00	1.65	2.00
Cotton Compound	8.75	1.65	2.00
Glencoe	8.00	2.46	3.00
Potato Guano	7.00	2.46	7.00
Nitrate of Soda	....	14.81	....
Muriate of Potash	....	....	50.00
Scotland Neck Guano Co., Scotland Neck, N. C.—			
Our 16 Per Cent Acid Phosphate	16.00	....	....
Our 14 Per Cent Acid Phosphate	14.00	....	....
Our Bone and Potash Mixture	10.00	....	4.00
Our Favorite Cotton Seed Meal Guano	9.00	1.65	2.00
Our Bright Tobacco Guano	8.00	2.47	3.00
Our Cotton Grower	8.00	1.65	2.00
Our Best Peanut Guano	5.50	1.23	5.50
Noah Biggs Truck Guano	9.00	4.10	5.00
Biggs Cotton Seed Meal Fish Scrap Guano	9.00	3.30	4.00
Josey's Cotton Seed Meal and Fish Scrap Tobacco Guano	9.00	2.47	3.00
Old Halifax Cotton Seed Meal and Fish Scrap Tobacco Guano	9.00	2.47	3.00
Scotland Neck's Favorite Cotton Seed Meal and Fish Scrap Guano	9.00	2.05	2.50
Josey's Cotton Seed Meal and Fish Scrap Cotton Grower	9.00	2.05	2.50
K. Elite Top Dressing	3.00	7.40	3.50
Nitrate of Soda	....	15.50	....
Sulphate of Potash	....	....	48.00
Muriate of Potash	....	....	48.00
Our Genuine German Kainit	....	....	12.00
The Southern Exchange Co., Maxton, N. C.—			
S. E. C. Acid Phosphate	16.00	....	....
S. E. C. Acid Phosphate	14.00	....	....
S. E. C. Potash Mixture	10.00	....	4.00
S. E. C. Bone and Potash Mixture	10.00	....	2.00
Juicy Fruit Fertilizer	9.00	1.85	4.00
The Walnut Fertilizer	8.50	2.06	2.50
Melon Grower	8.00	4.12	7.00
McKimmon's Special Truck Formula	8.00	4.12	7.00
Southern Exchange Co.'s Bright Tobacco Formula	8.00	2.47	4.00
That Big Stick Guano	8.00	2.47	4.00
Bull of the Woods Fertilizer	8.00	2.47	4.00
Jack's Best Fertilizer	8.00	2.47	3.00
Correct Cotton Compound	8.00	2.47	3.00
R. M. C. Special Crop Grower	8.00	2.47	3.00
Southern Exchange Co.'s Special Tobacco Fertilizer	8.00	1.65	3.00
Currie's Crop Lifter	8.00	1.65	3.00
The Racer Guano	8.00	1.65	3.00
The Coon Guano	8.00	1.65	2.00
Two Fours Guano	8.00	3.30	4.00
Nitrate of Soda	....	15.00	....
Muriate of Potash	....	....	49.00
Genuine German Kainit	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
The Southern Cotton Oil Co., Charlotte District, Concord, Charlotte, Davidson, Shelby, Gibson, Monroe and Wadesboro—			
Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
Gold Seal	14.00	....	....
Silver King	13.00	....	....
Conqueror Bone and Potash	10.00	....	4.00
Magnolia Bone and Potash	10.00	....	2.00
Uncle Sam	9.00	2.47	3.00
Home Made	9.00	2.05	3.00
Razem	9.00	1.65	3.00
King Bee	8.65	1.65	2.00
Choice	8.00	3.30	6.00
Conqueror	8.00	3.30	4.00
Canto	8.00	3.29	6.00
Melonite	8.00	3.29	4.00
Peacock	8.00	2.47	3.00
Moon	8.00	2.47	3.00
Red Bull	8.00	2.06	2.00
All-to-Good	8.00	2.05	3.00
Gloria	8.00	1.65	2.00
Double Two	8.00	1.65	2.00
Dandy Top Dresser	4.00	9.07	2.50
Nitrate of Soda	....	15.65	....
Nitrate of Soda	....	13.20	....
Labi	....	8.99	17.00
Muriate of Potash	....	....	48.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Southern Cotton Oil Co., Goldsboro, Fayetteville, Rocky Mount and Wilson—			
Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
Southern Cotton Oil Co.'s 14 Per Cent Acid Phosphate	14.00	....	....
Southern Cotton Oil Co.'s Special Mixture	8.00	3.30	4.00
Southern Cotton Oil Co.'s Special Cotton Grower	8.00	2.47	3.00
Southern Cotton Oil Co.'s Peanut Grower	8.00	1.65	4.00
Best & Thompson's Special Cotton Grower	9.00	2.27	2.00
Best & Thompson's High Grade	8.00	2.47	3.00
Goldsboro Cotton Grower	9.00	2.26	2.00
Goldsboro Oil Mill Special Mixture	8.00	3.30	4.00
Goldsboro Oil Mill Special Cotton Grower	8.00	2.47	3.00
Goldsboro Oil Mill High Grade	8.00	2.26	2.50
Goldsboro Oil Mill Standard	8.00	1.65	2.00
Fayetteville Oil Mill Special Mixture	8.00	3.30	4.00
Fayetteville Oil Mill Special Cotton Grower	8.00	2.47	3.00
Fayetteville Oil Mill High Grade	8.00	2.26	2.50
Fayetteville Oil Mill Standard	8.00	1.65	2.00
Wilson Oil Mill Special Mixture	8.00	3.30	4.00
Wilson Oil Mill Special Cotton Grower	8.00	2.47	3.00
Wilson Oil Mill High Grade	8.00	2.26	2.50
Wilson Oil Mill Standard	8.00	1.65	2.00
Rocky Mount Oil Mill Special Mixture	8.00	3.30	4.00
Rocky Mount Oil Mill Special Cotton Grower,	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Rocky Mount Oil Mill High Grade	8.00	2.26	2.50
Rocky Mount Oil Mill Standard	8.00	1.65	2.00
B. G. Thompson's Special Cotton and Tobacco Guano	8.00	2.47	3.00
The Southern Cotton Oil Co.'s Special Tobacco Grower	8.00	2.47	3.00
The Southern Cotton Oil Co. High Grade	8.00	2.26	2.50
The Southern Cotton Oil Co. Standard	8.00	1.65	2.00
Edgerton's Old Reliable	8.00	2.47	3.00
Morning Glory	8.00	2.47	3.00
Echo	8.00	2.06	3.00
Southern Special for Tobacco	6.00	2.90	6.00
Southern Special for Tobacco	6.00	2.89	6.00
Statesville Oil and Fertilizer Co., Statesville, N. C.—			
16 Per Cent Acid Phosphate	16.00	....	....
H. G. Acid Phosphate	14.00	....	....
Bone and Potash, 10-4	10.00	....	4.00
Bone and Potash, 10-2	10.00	....	2.00
833 Soluble Guano	8.00	2.47	3.00
King Cotton Soluble Guano	8.00	2.47	3.00
Grasoir	8.00	1.65	2.00
822 Statesville Oil and Fertilizer Co.	8.00	1.65	2.00
Tidewater Guano Co., Norfolk, Va.—			
Tidewater Raw Bone Meal.....Total	20.00	3.71	....
Top Rail Acid Phosphate	16.00	....	....
Buster Brown Acid Phosphate	14.00	....	....
Bully Boy Dissolved Bone and Potash	10.00	....	2.00
Diamond Brand Bone and Potash Compound	10.00	....	2.00
High Tide Soluble Guano	8.00	3.30	4.00
Sho Nuf Guano, H. G	8.00	2.48	3.00
Hawk Eye Soluble Guano	8.00	2.06	2.00
Soil King Special H. G. Guano	8.00	1.86	4.00
Double Action Soluble Guano	8.00	1.65	2.00
Genuine German Kainit	....	....	12.00
Tuscarora Fertilizer Co., Atlanta, Ga., and Wilmington, N. C.—			
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Tuscarora Alkaline Bone	10.00	....	5.00
Tuscarora Acid and Potash	10.00	....	4.00
Tuscarora Bone and Potash	10.00	....	2.00
Tuscarora Bone and Potash	8.00	....	4.00
Tuscarora Trucker	8.00	4.12	7.00
Tuscarora Champion	8.00	2.06	2.50
Tuscarora Champion Tobacco Grower	8.00	2.06	2.50
Tuscarora Fruit and Potato	8.00	1.65	10.00
Tuscarora Fertilizer No. 8-2-5	8.00	1.65	5.00
Tuscarora Standard	8.00	1.65	2.00
Tuscarora Standard Tobacco Grower	8.00	1.65	2.00
Manure Substitute	6.00	3.30	4.00
Fertilizer No. 844	8.00	3.30	4.00
Tobacco Special	8.00	2.47	3.00
Cotton Special	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Berry King	8.00	2.06	4.00
King Cotton	8.00	2.06	2.00
Big Four (4) Fertilizer	7.00	1.65	4.00
Nitrate of Soda	....	14.81	....
Sulphate of Potash	....	....	50.00
Muriate of Potash	....	....	48.00
Kainit	....	....	12.00
B. G. Thompson, Goldsboro, N. C.—			
Genuine German Kainit	....	....	12.00
Union Guano Co., Winston-Salem, N. C.—			
Raw Animal Bone Meal.....Total	23.00	2.47	....
Pure Animal Bone Meal.....Total	22.50	3.71	....
Pure Animal Bone Meal.....Total	22.50	2.47	....
Union 16 Per Cent Acid Phosphate	16.00	....	....
Union 12-6 Bone and Potash	12.00	....	6.00
Union 12-5 Bone and Potash	12.00	....	5.00
Union 12-4 Bone and Potash	12.00	....	4.00
Union 12-3 Bone and Potash	12.00	....	3.00
Union 12 Per Cent Acid Phosphate	12.00	....	....
Union 10-6 Bone and Potash	10.00	....	6.00
Union 10-5 Bone and Potash	10.00	....	5.00
Union 10-4 Bone and Potash	10.00	....	4.00
Union 8-5 Bone and Potash	8.00	....	5.00
Union High Grade Acid Phosphate	14.00	....	....
Union Dissolved Animal Bone.....Total	13.00	2.06	....
Union Dissolved Bone	13.00	....	....
Union Prolific Cotton Compound	10.00	3.29	4.00
Union Special Formula for Cotton	10.00	2.47	3.00
Union Mule Brand Guano	10.00	1.65	2.00
Union Bone and Potash	10.00	....	2.00
Union Perfect Cotton Grower	9.00	2.26	2.00
Union Complete Cotton Mixture	9.00	1.65	3.00
Union Approved Crop Grower	8.75	1.65	2.00
Union Guano for Cotton and Tobacco	8.00	3.29	6.00
Union Premium Guano	8.00	3.29	4.00
Union Homestead Guano	8.00	2.47	3.00
Union Water Fowl Guano	8.00	2.06	3.00
Union Standard Tobacco Grower	8.00	2.06	2.00
Union Potato Mixture	8.00	1.65	10.00
Union Superlative Guano	8.00	.82	4.00
Union Wheat Mixture	8.00	....	4.00
Union Vegetable Compound	7.00	4.12	8.00
Union Truck Guano	7.00	3.29	5.00
Liberty Bell Crop Grower	10.50	....	1.50
Quakers' Grain Mixture	10.00	....	4.00
Giant Phosphate and Potash	10.00	....	3.00
Finch & Harris' Special Bone and Potash Mixture	10.00	....	3.00
Farmers' Blood and Bone Guano	9.00	1.65	3.00
Q and Q (Quality and Quantity) Guano	9.00	1.65	1.00
"B. S." Ammoniated Guano	9.00	.82	3.00
Victoria High Grade Tobacco Guano	8.00	2.47	3.00
Sparger's Special Tobacco Grower	8.00	1.65	3.00
Old Honesty Guano	8.00	1.65	2.00
Old Honesty Tobacco Guano	8.00	1.65	2.00
Fish Brand Ammoniated Guano	8.00	1.65	2.00
Sunrise Ammoniated Guano	8.00	.82	3.00
Nitrate of Soda	....	14.83	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Muriate of Potash	....	....	49.00
Sulphate of Potash	....	....	48.00
Genuine German Kainit	....	....	12.00
Union Abattoir Co., Baltimore, Md., and Richmond, Va.—			
Pure Bone and Potash Compound	16.00	1.64	2.50
Pure Dissolved Animal Bone	12.00	1.64	....
Potash and Soluble Bone (Red Star)	12.00	....	3.00
Red Star Acid Phosphate	16.00	....	....
Red Star Acid Phosphate	14.00	....	....
Red Star Potash and Soluble Bone	12.00	....	5.00
Red Star Potash and Soluble Bone	10.00	....	5.00
Red Star Potash and Soluble Bone	10.00	....	2.00
Red Star Brand Tobacco Compound	9.00	3.27	2.00
Red Star Brand Cotton Guano	8.00	3.29	4.00
Red Star Early Truck and Tobacco Guano	8.00	3.28	4.00
Red Star Cotton and Tobacco Guano	8.00	2.46	3.00
Red Star Cotton Guano	8.00	1.64	2.00
Red Star Tobacco Fertilizer	8.00	2.05	2.00
Red Star Standard	8.00	1.65	2.00
Red Star Grain and Grass	8.00	1.00	4.00
Red Star Peanut Grower	8.00	1.00	4.00
Red Star Potato Manure	7.00	2.46	10.00
Red Star Special Guano	7.00	2.46	5.00
Red Star 7 Per Cent Guano	6.00	5.74	5.00
Early Potato and Truck Guano	6.00	4.10	7.00
Nitrate of Soda	....	15.58	....
Muriate of Potash	....	....	50.00
German Kainit	....	....	12.00
R. L. Upshur, Norfolk, Va.—			
Upshur's 16 Per Cent Acid Phosphate	16.00	....	....
Upshur's High Grade Acid Phosphate	14.00	....	....
Upshur's Wheat Compound	12.00	....	5.00
Upshur's Bone and Potash Guano	10.00	....	2.00
Upshur's O. P. (Old Plantation)	9.00	1.65	2.00
Upshur's 8-3-3 Cotton	8.00	2.47	3.00
Upshur's High Grade Tobacco Guano	8.00	2.47	3.00
Upshur's Special 2½-8-3	8.00	2.05	3.00
Upshur's F. F. V. (Favorite Fertilizer of Virginia)	8.00	1.65	2.00
Upshur's Peanut Guano	8.00	1.65	2.00
Upshur's G., G. & C. Guano	8.00	1.65	2.00
Upshur's Fish, Bone and Potash	8.00	1.64	4.00
Upshur's Formula, No. 1	7.00	6.58	11.00
Upshur's Formula, No. 2	7.00	6.58	5.00
Upshur's Special Truck Guano	7.00	4.11	8.00
Upshur's F. F. (Farmers' Favorite)	7.00	4.11	6.00
Upshur's F. C. (Farmers' Challenge)	6.00	5.76	6.00
Upshur's 7 Per Cent Irish Potato Guano	6.00	5.76	5.00
Upshur's 4-6-4	6.00	3.69	4.00
Upshur's Top Dresser Guano	5.00	8.23	2.00
Upshur's Norfolk Special 10 Per Cent	5.00	8.23	3.00
Upshur's Special Potato Guano	5.00	5.76	5.00
Upshur's 5 Per Cent	5.00	4.11	5.00
Cotton-seed Meal Mixture	9.00	2.26	2.00
Premo Cotton Guano	8.00	1.65	2.00
Nitrate of Soda	....	15.22	....
Ground Fish	....	8.23	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Ground Tankage	....	6.58	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
Venable Fertilizer Co., Richmond, Va.—			
Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone.....Total	20.00	3.29	....
Venable's Best Acid Phosphate	16.00	....	....
Venable's Alliance Acid Phosphate	14.00	....	....
Venable's Dissolved Bone	13.00	....	....
Venable's Standard Acid Phosphate	12.00	....	....
Venable's Corn, Wheat and Grass Fertilizer	10.00	.82	1.00
Venable's B. B. P. Manure	9.00	1.65	1.00
Venable's 5 Per Cent Trucker	8.00	4.11	5.00
Venable's 4 Per Cent Trucker	8.00	3.29	4.00
Venable's H. G. Tobacco Fertilizer	8.00	2.47	3.00
Venable's Alliance Tobacco Manure, No. 1	8.00	2.06	3.00
Venable's Alliance Tobacco Manure, No. 2	8.00	1.65	2.00
Venable's Alliance Bone and Potash Mixture	8.00	....	4.00
Venable's Cotton Grower	8.00	2.06	3.00
Venable's Roanoke Special	8.00	2.06	3.00
Venable's Ideal Manure	8.00	1.65	5.00
Venable's Meal Mixture	8.00	1.65	2.00
Venable's Peanut Special	8.00	.82	4.00
Venable's Peanut Grower	8.00	....	4.00
Venable's 10 Per Cent Trucker	6.00	8.23	2.00
Venable's 6-6-6 Manure	6.00	4.94	6.00
High Grade Bone and Potash Mixture	10.00	....	4.00
Bone and Potash Mixture	10.00	....	2.00
Roanoke Mixture	9.00	2.26	2.00
Roanoke Meal Mixture	9.00	2.26	2.00
Ballard's Choice Fertilizer	8.00	2.47	3.00
Our Union Tobacco Fertilizer	8.00	1.65	4.00
Our Union Special Fertilizer	8.00	1.65	2.00
Planters' Bone Fertilizer	8.00	1.65	2.00
Nitrate of Soda	....	15.63	....
Special Top Dresser	....	7.30	3.00
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Pure German Kainit	....	....	12.00
Virginia-Carolina Chemical Co., Richmond, Va.—			
V.-C. C. Co.'s 16 Per Cent Acid Phosphate	16.00	....	....
V.-C. C. Co.'s 14 Per Cent Acid Phosphate	14.00	....	....
V.-C. C. Co.'s Special High Grade Potash Mixture	12.00	....	6.00
V.-C. C. Co.'s H. G. Potash Mixture	12.00	....	5.00
V.-C. C. Co.'s 12-4 Grain Grower	12.00	....	4.00
V.-C. C. Co.'s Special Crop Grower	12.00	....	3.00
V.-C. C. Co.'s Grain Special	10.00	....	6.00
V.-C. C. Co.'s Standard Bone and Potash	10.00	....	5.00
V.-C. C. Co.'s Special Potash Mixture	10.00	....	4.00
V.-C. C. Co.'s Dissolved Bone and Potash	10.00	....	2.00
V.-C. C. Co.'s Cotton Grower	9.00	2.26	2.00
V.-C. C. Co.'s Farmers' Choice	8.00	3.29	4.00
V.-C. C. Co.'s Special	8.00	3.29	4.00
V.-C. C. Co.'s High Grade Tobacco Fertilizer	8.00	2.47	10.00
V.-C. C. Co.'s Monarch Brand	8.00	1.65	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s Corn and Peanut Special	8.00	1.65	2.00
V.-C. C. Co.'s Special Peanut Grower	8.00	1.00	4.00
V.-C. C. Co.'s Peanut Grower	8.00	.82	4.00
V.-C. C. Co.'s Potash Mixture for Peanuts	8.00	....	4.00
V.-C. C. Co.'s Truck Crop Fertilizer	7.00	4.12	7.00
V.-C. C. Co.'s Potash Potato Producer	7.00	3.29	8.00
V.-C. C. Co.'s Formula 44 for Bright Wrappers and Smokers	7.00	2.55	3.30
V.-C. C. Co.'s Special Truck Guano	6.00	4.12	7.00
V.-C. C. Co.'s High Grade Top Dresser	4.00	6.17	2.50
V.-C. C. Co.'s 10 Per Cent Top Dresser Extra H. G.	4.00	8.24	4.00
Johnston's Best	20.00	4.94	6.00
Sludge Acid Phosphate	14.00	....	....
Fulp's Acid Phosphate	13.00	....	....
Goodman's Special Potash Mixture	12.00	....	5.00
Battle's Crop Grower	12.00	....	3.00
Almont Acid Phosphate	12.00	....	....
Virginia 11-5 Bone and Potash	11.00	....	5.00
Sovereign Crop Producer	10.00	1.65	2.00
Ford's Wheat and Corn Guano	10.00	.82	2.50
Great Texas Cotton Grower Soluble Guano	9.00	2.47	4.00
Jeffreys' High Grade Guano	9.00	2.47	3.00
Southern Cotton Grower	9.00	2.29	2.00
Best's Special Cotton Grower	9.00	2.26	2.00
Best's H. G. Cotton and Tobacco Grower	8.00	2.47	3.00
Powell's Special H. G. C. S. M.	9.00	2.26	3.00
Prolific Cotton Grower	9.00	2.26	2.00
White Stem C. S. M.	9.00	2.26	2.00
Bumper Crop Grower	9.00	2.06	5.00
Star Brand Special H. G.	9.00	2.06	5.00
Cock's Soluble Guano High Grade Animal Bone	9.00	1.85	3.00
Reliable Cotton Brand Fertilizer	9.00	1.65	3.00
North State Guano C. S. M.	9.00	1.65	1.00
Bigelow's Crop Guano	9.00	.82	3.00
Burnhardt's Grain and Crop Guano	9.00	.82	3.00
McCormick's Wheat and Grain Guano	9.00	.82	3.00
Little Giant Grain and Grass Grower	9.00	.82	2.00
Farmers' Friend Favorite Fertilizer Special	8.50	1.65	2.00
Farmers' Success	8.00	2.47	4.00
Powhatan Crop Mixture	8.50	1.65	1.50
Pelican Truck Grower (1,000 pounds Peruvian Guano to the ton)	8.00	4.12	5.00
Carr's 8-4-4 Crop Grower	8.00	3.29	4.00
Jumbo Crop Grower (1,000 pounds Peruvian Guano to the ton)	8.00	2.48	3.00
Lion's High Grade Tobacco Fertilizer	8.00	2.47	4.00
Oldham's Special Compound for Tobacco, H. G.	8.00	2.47	3.00
Blake's Best	8.00	2.47	3.00
Royal High Grade Fertilizer	8.00	2.47	3.00
Special High Grade Tobacco Fertilizer	8.00	2.47	3.00
Adams' Special	8.00	2.47	3.00
Peruvian H. G. Tobacco Guano	8.00	2.47	3.00
Red Chief H. G. Cotton Grower	8.00	2.47	3.00
Zeno Special Compound for Tobacco, H. G.	8.00	2.47	3.00
Gold Medal H. G. Tobacco Guano	8.00	2.47	3.00
Atlas Guano C. S. M.	8.00	2.47	2.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Admiral	8.00	2.47	2.50
Good Luck C. S. M.	8.00	2.47	2.50
Split Silk C. S. M.	8.00	2.47	2.50
Myatt's Special High Grade Fertilizer	8.00	2.29	3.00
Orange Grove Guano	8.00	2.26	2.50
Delta C. S. M.	8.00	2.26	2.50
Royal Crown	8.00	2.26	2.00
Pace's Special 5 Per Cent Potato Guano	8.00	2.06	5.00
Blue Star C. S. M.	8.00	2.06	3.00
Superlative C. S. M. Guano	8.00	2.06	3.00
Smith's Irish Potato Guano	8.00	1.65	10.00
Parker & Hunter's Special	8.00	1.65	4.00
Winston Special for Cotton	8.00	1.65	2.00
Diamond Dust C. S. M.	8.00	1.65	2.00
Plant Food C. S. M.	8.00	1.65	2.00
Wilson's Standard C. S. M.	8.00	1.65	2.00
Ajax C. S. M. Guano	8.00	1.65	2.00
Farmers' Favorite Fertilizer C. S. M.	8.00	1.65	2.00
Charlotte Oil and Fertilizer Co.'s The Leader B. G.	8.00	1.65	2.00
Jones' Grain Special	8.00	....	4.00
Konqueror H. G. Truck Fertilizer	7.00	4.12	5.00
Pasquotank Trucker	7.00	3.29	8.00
Invincible High Grade Fertilizer	6.00	4.12	7.00
Dewberry's Special	4.00	6.59	....
Sulphate of Ammonia	....	20.59	....
Sulphate of Potash	....	....	48.00
Nitrate of Soda	....	14.82	....
Fish Scrap	....	8.24	....
Muriate of Potash	....	....	49.00
Manure Salts	....	....	20.00
Genuine German Kainit	....	....	12.00
Allison & Addison's Fulton Acid Phosphate	14.00	....	....
Allison & Addison's I. X. L. Acid Phosphate	13.00	....	....
Allison & Addison's Standard Acid Phosphate	12.00	....	....
Allison & Addison's Rocket Acid Phosphate	12.00	....	....
Allison & Addison's B. P. Potash Mixture	10.00	....	2.00
Allison & Addison's McGavock's Special Potash Mixture	10.00	....	2.00
Allison & Addison's Star Special Tobacco Manure	9.00	2.26	2.00
Allison & Addison's Star Brand Special H. G.	9.00	2.06	5.00
Allison & Addison's Star Brand Guano	9.00	1.65	1.00
Allison & Addison's Little Giant Grain and Grass Grower	9.00	.82	2.00
Allison & Addison's A. A. Guano	8.00	2.47	3.00
Allison & Addison's Anchor Brand Tobacco Fertilizer	8.50	2.26	2.00
Allison & Addison's Star Vegetable Brand Guano	8.00	3.71	4.00
Allison & Addison's Anchor Brand Fertilizer	8.00	1.65	2.00
Allison & Addison's Old Hickory Guano	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate	16.00	....	....
Atlantic and Virginia Fertilizer Co.'s Valley of Virginia Phosphate	14.00	....	....
Atlantic and Virginia Fertilizer Co.'s Crenshaw Acid Phosphate	13.00	....	....
Atlantic and Virginia Fertilizer Co.'s Our Acid Phosphate	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Atlantic and Virginia Fertilizer Co.'s Eureka Bone and Potash Compound	10.00	....	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone Special for Tobacco	9.00	2.06	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Complete Manure	9.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Virginia Truckers	8.00	4.12	5.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Special for Tobacco	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Carolina Truckers	7.00	5.76	7.00
Charlotte Oil and Fertilizer Co.'s 15 Per Cent Acid Phosphate	15.00	....	....
Charlotte Oil and Fertilizer Co.'s Catawba Bone Phosphate	14.00	....	....
Charlotte Oil and Fertilizer Co.'s Charlotte Acid Phosphate	13.00	....	....
Charlotte Oil and Fertilizer Co.'s Dayvault's Special	12.00	....	6.00
Charlotte Oil and Fertilizer Co.'s Charlotte Dissolved Bone	12.00	....	....
Charlotte Oil and Fertilizer Co.'s Oliver's Perfect Wheat Grower	11.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s 10-2 Bone and Potash	10.00	....	2.00
Charlotte Oil and Fertilizer Co.'s High Grade Special Tobacco Fertilizer	9.00	2.06	2.00
Charlotte Oil and Fertilizer Co.'s Queen of the Harvest C. S. M.	9.00	1.65	2.00
Charlotte Oil and Fertilizer Co.'s McCrary's Diamond Bone and Potash	9.00	....	3.00
Charlotte Oil and Fertilizer Co.'s Groom's Special Tobacco Fertilizer	8.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s Catawba Guano B. G.	8.00	2.47	3.00
Charlotte Oil and Fertilizer Co.'s Special 3 Per Cent Guano C. S. M.	8.00	2.47	2.00
Charlotte Oil and Fertilizer Co.'s Charlotte Ammoniated Guano B. G.	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s Charlotte Ammoniated Guano C. S. M.	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s King Cotton Grower	8.00	1.65	2.00
Davie & Whittle's Owl Brand High Grade Acid Phosphate	16.00	....	....
Davie & Whittle's Owl Brand High Grade Dissolved Bone	14.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate,	13.00	....	....
Davie & Whittle's Owl Brand Dissolved Bone.	12.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate with Potash	10.00	....	2.00
Davie & Whittle's Owl Brand High Grade 3 Per Cent Soluble Guano	9.00	2.06	3.00
Davie & Whittle's Owl Brand Special Tobacco Guano	9.00	2.06	2.00
Davie & Whittle's Owl Brand Truck Guano..	8.00	4.94	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Davie & Whittle's Owl Brand Guano for Tobacco	8.00	2.47	3.00
Davie & Whittle's Vinco Guano	8.00	1.65	3.00
Davie & Whittle's Owl Brand Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Durham Best Acid Phosphate	16.00	....	....
Durham Fertilizer Co.'s Standard High Grade Acid Phosphate	14.00	....	....
Durham Fertilizer Co.'s Excelsior Dissolved Bone Phosphate	14.00	....	....
Durham Fertilizer Co.'s Blacksburg Dissolved Bone	13.00	....	....
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official Acid Phosphate	13.00	....	....
Durham Fertilizer Co.'s Double Bone Phosphate	13.00	....	....
Durham Fertilizer Co.'s Durham Acid Phosphate	12.00	....	....
Durham Fertilizer Co.'s Great Wheat and Corn Grower	10.50	....	1.50
Durham Fertilizer Co.'s Diamond Wheat Mixture	10.00	....	3.00
Durham Fertilizer Co.'s Standard Wheat and Corn Grower	10.00	....	2.00
Durham Fertilizer Co.'s Blue Ridge Wheat Grower	10.00	....	2.00
Durham Fertilizer Co.'s Standard Wheat Grower	10.00	....	2.00
Durham Fertilizer Co.'s Durham Bone and Potash Mixture	10.00	....	2.00
Durham Fertilizer Co.'s L. & N. Special	9.00	2.47	2.00
Durham Fertilizer Co.'s Standard Guano	9.00	1.65	2.00
Durham Fertilizer Co.'s Durham Ammoniated Fertilizer	9.00	1.65	1.00
Durham Fertilizer Co.'s Special Plant and Truck Fertilizer	8.00	4.12	3.00
Durham Fertilizer Co.'s Durham High Grade.	8.00	3.29	4.00
Durham Fertilizer Co.'s Gold Medal Brand Guano	8.00	2.47	3.00
Durham Fertilizer Co.'s Yellow Leaf Tobacco Guano	8.00	2.47	3.00
Diamond Cotton-seed Meal Guano	8.00	2.47	3.00
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official Guano	8.00	2.06	3.00
Durham Fertilizer Co.'s Pride of Durham Tobacco Grower	8.00	2.06	3.00
Durham Fertilizer Co.'s Raw Bone Superphosphate for Tobacco	8.00	2.06	2.00
Durham Fertilizer Co.'s Raw Bone Superphosphate	8.00	2.06	1.50
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Genuine Bone and Peruvian Tobacco Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Blacksburg Soluble Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Progressive Farmer Guano	8.00	1.65	2.00
Durham Fertilizer Co.'s Carr's Special Wheat Grower	8.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Durham Fertilizer Co.'s Best Potato Manure.	7.00	5.76	7.00
Lynchburg Guano Co.'s Ironside Acid Phosphate	16.00	....	....
Lynchburg Guano Co.'s Lynchburg High Grade Acid Phosphate	14.00	....	....
Lynchburg Guano Co.'s Arvonia Acid Phosphate	13.00	....	....
Lynchburg Guano Co.'s Spartan Acid Phosphate	12.00	....	....
Lynchburg Guano Co.'s Alpine Mixture	10.00	....	5.00
Lynchburg Guano Co.'s S. W. Special Bone and Potash Mixture	10.00	....	4.00
Lynchburg Guano Co.'s Dissolved Bone and Potash	10.00	....	2.00
Lynchburg Guano Co.'s Independent Standard,	8.50	1.65	2.00
Lynchburg Guano Co.'s Bright Belt Guano	8.00	2.47	3.00
Lynchburg Guano Co.'s Solid Gold Tobacco	8.00	2.26	4.00
Lynchburg Guano Co.'s New Era	8.00	1.65	3.00
Lynchburg Guano Co.'s Lynchburg Soluble	8.00	1.65	2.00
Lynchburg Guano Co.'s Lynchburg Soluble for Tobacco	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Reliable Acid Phosphate	14.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Best Acid Phosphate	13.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Soluble Bone	12.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Bone and Potash	10.00	....	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Trucker and Tomato Grower	8.00	4.12	5.00
Norfolk and Carolina Chemical Co.'s Amazon High Grade Manure	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Grower	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Amazon H. G. Special Tobacco Guano	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Cooper's Bright Tobacco Fertilizer	8.00	2.06	3.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Made Especially for Tobacco	8.00	2.06	2.00
Norfolk and Carolina Chemical Co.'s Crescent Brand Ammoniated Fertilizer	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s High Grade Acid Phosphate	14.00	....	....
Old Dominion Guano Co.'s Bone Phosphate	13.00	....	....
Old Dominion Guano Co.'s Royster's Acid Phosphate	12.00	....	....
Old Dominion Guano Co.'s Obelisk Brand Bone and Potash	10.00	....	4.00
Old Dominion Guano Co.'s Planters' Bone and Potash Mixture	10.00	....	3.00
Old Dominion Guano Co.'s Old Dominion Alkaline Bone and Potash	10.00	....	2.00
Old Dominion Guano Co.'s Horne's Cotton Fertilizer	9.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Old Dominion Guano Co.'s Standard Raw Bone Soluble Guano	9.00	1.65	1.00
Old Dominion Guano Co.'s Farmers' Friend High Grade Fertilizer	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Friend Special Tobacco Fertilizer	8.00	2.47	3.00
Old Dominion Guano Co.'s Osceola Tobacco Guano	8.00	2.06	3.00
Old Dominion Guano Co.'s Farmers' Friend Fertilizer	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Special Wheat Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Tobacco Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Guano	8.00	1.65	2.00
Old Dominion Guano Co.'s Bullock's Cotton Grower	8.00	1.65	2.00
Old Dominion Guano Co.'s Millers' Special Wheat Mixture	8.00	....	4.00
Old Dominion Guano Co.'s Old Dominion 7-7-7 Truck Guano	7.00	5.76	7.00
Old Dominion Guano Co.'s Old Dominion Potato Manure	7.00	4.12	8.00
Old Dominion Guano Co.'s 7 Per Cent Truck Fertilizer	6.00	5.76	6.00
Old Dominion Guano Co.'s Old Dominion 6-7-5 Truck Guano	6.00	5.76	5.00
Old Dominion Guano Co.'s Old Dominion Special Sweet Potato Guano	6.00	1.65	6.00
Old Dominion Guano Co.'s 10 Per Cent Truck Fertilizer	5.00	8.24	2.50
Powers, Gibbs & Co.'s Almont High Grade Acid Phosphate	14.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Best Acid Phosphate	13.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate	12.00	....	....
Powers, Gibbs & Co.'s Acid Phosphate and Potash	10.50	....	1.50
Powers, Gibbs & Co.'s Almont Wheat Mixture.	10.00	....	3.00
Powers, Gibbs & Co.'s Dissolved Bone and Potash	10.00	....	2.00
Powers, Gibbs & Co.'s Cotton Seed Meal Standard Guano	9.00	2.47	2.00
Powers, Gibbs & Co.'s Truck Farmers' Special Ammoniated Guano	8.00	3.29	5.00
Powers, Gibbs & Co.'s Cotton Brand Ammoniated Dissolved Bone	8.00	3.29	4.00
Powers, Gibbs & Co.'s Old Kentucky High Grade Manure	8.00	2.47	3.00
Powers, Gibbs & Co.'s Cotton Belt Ammoniated Guano	8.00	2.47	2.00
Powers, Gibbs & Co.'s Carolina Golden Belt Ammoniated Guano for Tobacco	8.00	2.06	3.00
Powers, Gibbs & Co.'s Powers' Ammoniated Guano	8.00	2.06	2.00
Powers, Gibbs & Co.'s Gibbs' Ammoniated Guano	8.00	2.06	1.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Powers, Gibbs & Co.'s Almont Soluble Ammoniated Guano	8.00	1.65	2.00
Powers, Gibbs & Co.'s Cotton Seed Meal Soluble Ammoniated Guano	8.00	1.65	2.00
Powers, Gibbs & Co.'s Eagle Island Ammoniated	8.00	1.65	2.00
Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate	16.00	....	....
Southern Chemical Co.'s Chick's 16 Per Cent Acid Phosphate	16.00	....	....
Southern Chemical Co.'s Red Cross 14 Per Cent Acid Phosphate	14.00	....	....
Southern Chemical Co.'s Victor Acid Phosphate	13.00	....	....
Southern Chemical Co.'s Chatham Acid Phosphate	13.00	....	....
Southern Chemical Co.'s Reaper Grain Application	12.00	....	3.00
Southern Chemical Co.'s Tar Heel Acid Phosphate	12.00	....	....
Southern Chemical Co.'s Horseshoe Acid Phosphate	12.00	....	....
Southern Chemical Co.'s Quickstep Bone and Potash	11.00	....	5.00
Southern Chemical Co.'s Solid South	10.00	....	6.00
Southern Chemical Co.'s Winner Grain Mixture	10.00	....	4.00
Southern Chemical Co.'s Farmers' Pride Bone and Potash	10.00	....	3.00
Southern Chemical Co.'s Winston Bone and Potash Compound	10.00	....	2.00
Southern Chemical Co.'s Mammoth Corn Grower	10.00	....	2.00
Southern Chemical Co.'s Mammoth Wheat and Grass Grower	10.00	....	2.00
Southern Chemical Co.'s Sun Brand Guano	9.00	2.06	5.00
Southern Chemical Co.'s George Washington Plant Bed Fertilizer for Tobacco	8.00	2.47	2.50
Southern Chemical Co.'s Pilot Ammoniated Guano Special for Tobacco	8.00	2.06	3.00
Southern Chemical Co.'s Electric Tobacco Guano	8.00	1.65	2.00
Southern Chemical Co.'s Electric Standard Guano	8.00	1.65	2.00
Southern Chemical Co.'s Yadkin Complete Fertilizer	8.00	1.65	2.00
Southern Chemical Co.'s Chick's Special Wheat Compound	8.00	....	4.00
J. G. Tinsley & Co.'s Powhatan Acid Phosphate	14.00	....	....
J. G. Tinsley & Co.'s Tinsley's Dissolved S. C. Bone	13.00	....	....
J. G. Tinsley & Co.'s Stonewall Brand Acid Phosphate	12.00	....	....
J. G. Tinsley & Co.'s Tinsley's Bone and Potash Mixture	10.00	....	2.00
J. G. Tinsley & Co.'s Tinsley's Tobacco Fertilizer	8.00	3.29	2.50
J. G. Tinsley & Co.'s Richmond Brand Guano	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
J. G. Tinsley & Co.'s Killickinick Tobacco Mixture	8.00	2.06	3.00
J. G. Tinsley & Co.'s Lee Brand Guano	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Brand Guano,	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Tobacco Guano,	8.00	1.65	2.00
J. G. Tinsley & Co.'s Tinsley's Special Irish Potato Guano	6.00	5.76	6.00
J. G. Tinsley & Co.'s Tinsley's 7 Per Cent Ammoniated Guano for Beans, Peas, Cabbage, Strawberries, etc	6.00	5.76	6.00
J. G. Tinsley & Co.'s Tinsley's Irish Potato Guano	6.00	4.94	6.00
J. G. Tinsley & Co.'s Tinsley's Strawberry Grower	6.00	3.29	4.00
J. G. Tinsley & Co.'s Tinsley's Top Dresser	5.00	9.06	....
J. G. Tinsley & Co.'s Tinsley's 10 Per Cent Truck Guano	5.00	8.24	2.50
S. W. Travers & Co.'s Champion Acid Phosphate	16.00	....	....
S. W. Travers & Co.'s Travers' Dissolved Acid Phosphate	14.00	....	....
S. W. Travers & Co.'s Standard Dissolved S. C. Bone	13.00	....	....
S. W. Travers & Co.'s Capital Dissolved Bone,	12.00	....	....
S. W. Travers & Co.'s Capital Bone and Potash Compound	10.00	....	2.00
S. W. Travers & Co.'s Capital Truck Fertilizer	8.00	3.29	3.00
S. W. Travers & Co.'s Capital Tobacco Fertilizer	8.00	3.29	3.00
S. W. Travers & Co.'s Big Leaf Tobacco Grower, H. G.	8.00	2.47	3.00
S. W. Travers & Co.'s Capital Cotton Fertilizer	8.00	2.06	2.00
S. W. Travers & Co.'s National Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s National Special Tobacco Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s Beef, Blood and Bone Fertilizer	8.00	1.65	2.00
S. W. Travers & Co.'s Travers' Special Wheat Compound	8.00	....	4.00
S. W. Travers & Co.'s Travers' 7 Per Cent Truck Fertilizer	6.00	5.76	5.00
Virginia State Fertilizer Co.'s Bull Run Acid Phosphate	16.00	....	....
Virginia State Fertilizer Co.'s Gilt Edge Brand Acid Phosphate	14.00	....	....
Virginia State Fertilizer Co.'s Clipper Brand Acid Phosphate	13.00	....	....
Virginia State Fertilizer Co.'s Lurich Acid Phosphate	12.00	....	....
Virginia State Fertilizer Co.'s Alps Brand Acid Phosphate	12.00	....	....
Virginia State Fertilizer Co.'s Mountain Top Bone and Potash	10.00	....	5.00
Virginia State Fertilizer Co.'s XX Potash Mixture	10.00	....	4.00
Virginia State Fertilizer Co.'s Virginia State Dissolved Bone and Potash	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia State Fertilizer Co.'s Number One Soluble Guano	9.00	1.65	2.00
Virginia State Fertilizer Co.'s Highland King,	9.00	1.65	1.00
Virginia State Fertilizer Co.'s Gamecock Special for Tobacco	8.50	1.65	2.00
Virginia State Fertilizer Co.'s Virginia State High Grade Tobacco Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Bull Dog Soluble Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Dunnington's Special Formula for Tobacco	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Peerless Tobacco Guano	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Buffalo Guano,	8.00	2.06	3.00
Virginia State Fertilizer Co.'s Austrian Tobacco Grower	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Gilt Edge Special Tobacco Guano	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Virginia State Guano	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Battle Axe Tobacco Guano	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Gilt Edge Brand Dissolved Bone and Potash	8.00	....	4.00
Thomas Wakefield, Friendship, N. C.—			
Bone Meal .....Total	21.73	4.12	....
Williams & Clark Fertilizer Co., Charleston, S. C.—			
Standard Americus Ammoniated Bone Superphosphate	9.00	1.85	1.00
Winborne Guano Co., Norfolk, Va.—			
Standard 16 Per Cent Acid Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
Soluble Bone and Potash	10.00	....	2.00
Winborne's 3-8-4 Guano	8.00	2.47	4.00
Winborne's Tobacco Guano	8.00	2.47	3.00
Winborne's Excelsior Guano	8.00	1.65	2.00
Winborne's Eureka Guano	8.00	1.65	2.00
Winborne's Triumph Guano	8.00	1.65	2.00
Winborne's Special Peanut Guano	8.00	.82	4.00
Winborne's 7 Per Cent Guano	5.00	5.75	5.00
King Taminy Guano	8.00	2.47	3.00
Farmers' Select Guano	8.00	2.06	3.00
Nitrate of Soda	....	15.65	....
Muriate of Potash	....	....	50.00
Genuine German Kainit	....	....	12.00
T. W. Wood & Sons, Richmond, Va.—			
Wood's Pure Animal Bone.....Total	23.00	2.47	....
Standard H. G. Acid Phosphate	16.00	....	....
Standard High Grade Acid Phosphate	14.00	....	....
Standard Corn Fertilizer	10.00	.82	1.00
Standard Bone and Potash Mixture	10.00	....	2.00
Standard Crop Grower	9.00	.82	2.00
Standard Wheat Fertilizer	9.00	.82	2.00
Standard High Grade Trucker Fertilizer	8.00	4.94	6.00
Standard Vegetable Fertilizer	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Standard Potash Fertilizer	8.00	1.65	5.00
Standard Grain and Grass Fertilizer	8.00	1.65	2.00
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Wood's Lawn Enricher	6.00	2.47	3.00
Nitrate of Soda	....	15.63	....
Muriate of Potash	....	....	50.00
Sulphate of Potash	....	....	48.00
Kainit	....	....	12.00
Wessel, Duval & Co., New York—			
Nitrate of Soda	....	14.85	....
The J. R. Young Fertilizer Co., Norfolk, Va.—			
High Grade 16 Per Cent Acid Phosphate	16.00	....	....
Bone and Potash	10.00	....	2.00
J. R. Young's 2¾-9-2 Special Guano	9.00	2.26	2.00
J. R. Young's Special 3-8-3 Guano for Cotton	8.00	2.47	3.00
J. R. Young's New Process 3-8-3 Guano for Tobacco	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Cotton, Corn and Peanuts	8.00	1.65	2.00
J. R. Young's Special Guano for Potatoes	6.00	4.11	5.00
J. R. Young's Improved Fish and Bone Manure for All Crops	6.00	3.29	4.00
J. R. Young's Top Dresser	5.00	5.76	3.00
J. R. Young's 4-4-6 Special for Tobacco	4.00	3.29	6.00
Genuine German Kainit	....	....	12.00
Fremont H. G. Guano	8.00	3.29	4.00

LEAF TOBACCO SALES FOR JUNE, 1910.

Pounds sold for producers, first hand	226,633
Pounds sold for dealers	22,490
Pounds resold for warehouses	72,902
Total	322,025

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH.

Volume 31. No. 8. AUGUST, 1910. Whole No. 139.

I. FERTILIZER EXPERIMENTS WITH COTTON ON PIEDMONT RED CLAY LOAM SOIL

AND

II. VARIETIES, CULTURE AND FERTILIZATION OF COTTON ON THIS SOIL.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE.

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF.

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.
G. B. Walker	Assistant to Director Test Farms.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, August 10, 1910.

SIR:—I submit in manuscript a report covering experiments with cotton on the Iredell Test Farm for the years 1903-'09, inclusive, together with a discussion of the results. B. W. Kilgore and C. B. Williams are responsible for the plans and conduct of the work in 1903-'07; B. W. Kilgore and G. M. MacNider 1907-'09. F. T. Meacham had charge of the culture and handling of the crop and E. L. Worthen, G. B. Walker, and W. C. Etheridge did the main work in putting the results in tabular form. B. W. Kilgore is responsible for the form of the report, the conclusions, and the writing of it.

The JUNE BULLETIN contained a like report of experiments with cowpeas on the Iredell Test Farm, and similar reports are to follow, covering the work on the Iredell Test Farm with corn, and on the Edgecombe Test Farm with corn and cotton.

I recommend the publication of this report as the AUGUST BULLETIN.

Respectfully,

B. W. KILGORE,
Director of Test Farms.

To HON. W. A. GRAHAM,
Commissioner of Agriculture.

I. FERTILIZER EXPERIMENTS WITH COTTON ON PIEDMONT RED CLAY LOAM SOIL

AND

II. VARIETIES, CULTURE, AND FERTILIZATION OF COTTON ON PIEDMONT RED CLAY LOAM, RED CLAY, AND VALLEY SOILS.

Being a Report of Work with Cotton on the Iredell Test Farm in 1903-'09, Inclusive.

By B. W. Kilgore, C. B. Williams, G. M. MacNider, and F. T. Meacham.

GENERAL SUMMARY OF RESULTS OF FERTILIZER TESTS.

1. The proper fertilization of cotton pays large profits, larger ones than any other staple crop generally grown in the State. What this fertilization should be on this and similar soils is shown by the results of our experiments as given on the following pages.

2. For the production of cotton on this land nitrogen alone was used at a loss; potash alone gave small increase in yields and profits; potash and nitrogen combined were less effective than potash alone, indicating that potash is more important than nitrogen, though neither is very effective, and should not be used alone or combined for cotton on this soil.

3. Phosphoric acid alone produced decidedly increased yields at good profits in all cases. Nitrogen combined with phosphoric acid did not increase the yields very much over phosphoric acid alone, while potash added to phosphoric acid produced profitable results. Nitrogen, phosphoric acid, and potash combined in a complete fertilizer yielded larger returns and profits than either one of the three constituents or two of them combined, the indications being that practically two-thirds of the increased yields and profits were the result of phosphoric acid, and one-third of potash and nitrogen together, potash being rather more important than nitrogen.

The experiments as a whole show that phosphoric acid is the predominant or controlling constituent for increasing yields and adding to profits in growing cotton on this soil.

4. The average results show that lime alone was used at very small profit, while in combination with nitrogen, phosphoric acid, and potash to make a complete fertilizer, the application was at a loss, the complete fertilizer without lime producing larger yield and greater profit than when lime was used in connection with them. It might be well to bear in mind that lime alone on the plat in Field C, where peas have been grown four years, gave good returns, though even here lime in combination with a complete fertilizer gave less returns than the fertilizer without the lime.

On a whole, the indications are that this soil does not need lime for cotton production.

5. The amount of nitrogen in the normal fertilizer (400 pounds per acre), applied in the cotton experiments, was 2½ per cent, or 10 pounds to the acre. This amount was varied so as to give 5, 10, 20, and 30 pounds of nitrogen per acre. The yields and profits did not increase for the larger quantities of nitrogen. On an average, the largest profit was obtained from the smallest amount of nitrogen, or 5 pounds per acre, though 20 pounds per acre produced the largest increased yield. Five pounds of nitrogen would be supplied by 38½ pounds of 13 per cent dried blood and 10 pounds by 77 pounds of blood.

6. The amount of potash in the normal fertilizer (400 pounds per acre) used was 2½ per cent or 10 pounds per acre. Varying this amount so as to apply 5, 10, 20, and 30 pounds per acre respectively, showed as an average of the results that 10 pounds of potash per acre, or 2½ per cent in the mixture, gave the most profitable returns. Five pounds of potash would be supplied by 25 pounds of 20 per cent manure salt and 10 pounds by 50 pounds of manure salt.

7. The amount of phosphoric acid in the normal fertilizer (400 pounds per acre) was 7 per cent, or 28 pounds per acre. This quantity was varied so as to apply 14, 28, 56, and 84 pounds respectively of phosphoric acid per acre. The most profitable yield was from 28 pounds, though the largest yield came from an application of 84 pounds per acre. These amounts of phosphoric would be supplied by 100, 200, 400, and 600 pounds respectively of 14 per cent acid phosphate.

8. Varying the amounts of the normal fertilizer application from 200 to 1,000 pounds per acre gave increased yield and profits for all

the applications, the results being quite uniform in this regard and the averages, after paying for the fertilizer, showed the following net profits:

200 pounds of fertilizer per acre gave a profit of $16.00;
400 pounds of fertilizer per acre gave a profit of 27.61;
600 pounds of fertilizer per acre gave a profit of 32.30;
800 pounds of fertilizer per acre gave a profit of 33.84;
1,000 pounds of fertilizer per acre gave a profit of 36.86.

Putting this in a slightly different way, the first 200 pounds of fertilizer yielded a net profit (after paying for cost of fertilizer) of $8 for each 100 pounds of fertilizer; the application of 400 pounds yielded $6.70 per 100 pounds; 600 pounds yielded $5.38 per 100 pounds; 800 pounds yielded $4.23 per 100 pounds, and 1,000 pounds yielded a profit of $3.69 per 100 pounds of fertilizer.

9. Comparisons of dried blood and nitrate of soda as sources of nitrogen show no special advantage one over the other in the production of cotton on this soil. In the tests nitrate of soda was applied one-half at planting and one-half about July first, on one plat; one-half was applied about July first, the other half of the nitrogen coming from dried blood, which was applied before planting, on another plat, and on a third plat nitrate of soda furnished one-fifth of the nitrogen, the balance coming from dried blood, all being applied before planting. The blood was applied one-half at planting and one-half about July first on one plat; one-half at planting, the rest of the nitrogen coming from nitrate of soda which was applied July first on another plat, and on a third plat four-fifths of the nitrogen was supplied by blood and one-fifth by nitrate of soda. The most economical method of application and the one which yielded as large profits as any, is to put all of the fertilizer in the drill before planting, using either all blood or part blood and part nitrate of soda. It is possible that nitrate of soda as the sole source of nitrogen, put out before planting, will give as good results as where a part of the nitrogen comes from blood; but this was not tested.

10. When 400 pounds of fertilizer were applied each in the drill before planting, broadcast before planting, and divided into two equal parts, one-half being applied in the drill before planting and the other half as a side dressing about July first, the broadcast application yielded about two-thirds the increased yield and profit that the other

two methods of application did. The other two methods of application were practically equal in increased yields and profits.

11. Where 400 pounds is used to the acre the best and most economical method of application is in the drill before planting.

12. Our soil analyses of the various soils of the State indicate that these results will apply to the red (cecil) clay loams or red (cecil) clays and valley soils of the Piedmont section of the State.

13. For the production of cotton on these soils, taking the results here reported as a whole, it is recommended that at least 400 pounds of fertilizer be used and as much more as can be afforded up to 1,000 pounds per acre. The fertilizer can be most profitably applied in the drill before planting, though there is no objection to dividing the application into two parts, putting out one-half in the drill before planting and the other half as a side dressing about July first, according to season. The fertilizer mixture should contain about 10 per cent phosphoric acid and 2 per cent each of nitrogen and potash. The nitrogen may be all derived from blood, tankage, cotton-seed meal, or similar products, or in part from one or all of these, and in part (up to one-half) from nitrate of soda.

Kainit, manure salt, sulphate or muriate of potash may furnish the potash, and acid phosphate the phosphoric acid.

Four hundred pounds of the above mixture would contain 40 pounds of available phosphoric acid and 8 pounds each of nitrogen and potash, and 1,000 pounds would contain 100 pounds of available phosphoric acid and 20 pounds each of nitrogen and potash. The required amounts of phosphoric acid in 400 and 1,000 pounds respectively of this mixture would be supplied by 286 pounds and 715 pounds of 14 per cent acid phosphate; the nitrogen by 61.5 pounds and 154 pounds of 13 per cent dried blood; and the potash by 40 pounds and 100 pounds of manure salt. Other materials or other grades of these same materials may be used, and it will not be difficult, knowing just what they contain, to use such quantities of them as will be necessary to furnish the quantities of plant food, having in mind that it is the specific number of pounds of phosphoric acid, nitrogen and potash that is desired, rather than a given weight of mixed fertilizer.

I. FERTILIZER EXPERIMENTS WITH COTTON ON PIEDMONT RED CLAY LOAM SOIL.

This is the second of a series of Bulletins giving the results of experiments to determine the fertilizer needs of different crops on different type soils. The first report, issued as the JUNE (1910) BULLETIN, gave the "Results of Fertilizer and Variety Experiments with Cowpeas on Piedmont Red Clay Loam Soil."

WORK REPORTED.

Cotton is our leading money crop. More commercial fertilizer is used in fertilizing and growing this crop than any other. It responds readily and profitably to proper fertilization. Some ten years ago systematic experiments were begun to determine the fertilizer or plant-food requirements for the most economical production of cotton on our different cotton soils.

On the following pages are recorded the results of seven years' fertilizer and variety tests of cotton on the Iredell Test Farm of this Department, extending through the years 1903-1909, both inclusive. The work is being continued to collect further data, when cotton is grown as it has been in the work here recorded, as well as in rotations with other staple crops and soil-improving crops.

LOCATION OF FARM AND CHARACTER OF SOIL.

The Iredell Test Farm is located near Statesville, in Iredell County, well up in the Piedmont (foothill) section of the State, the elevation being 950 feet above sea-level. The main type of soil on the farm is red (cecil) clay loam, the subsoil being a moderately heavy clay, but the surface soil has sufficient sand in it to make it a clay loam rather than a clay, though when freshly plowed it would to a casual observer be looked upon as red clay. The main types of soil in the Piedmont are cecil sandy loam (gray land), red (cecil) clay loam, and red (cecil) clay, the latter two being the predominating types. The clay and clay-loam types are rich in potash, very poor in phosphoric acid, the amount of nitrogen depending on the organic matter in the soil. Analyses of samples of soil from the unfertilized plats, on which these experiments were conducted, show that the soil contains about the following number of pounds of plant food per acre (to a depth of ten inches, estimating the weight of this ten-inch acre soil to be three million pounds):

Nitrogen (N)	2,010 pounds.
Phosphoric Acid (P_2O_5)	2,280 pounds.
Potash (K_2O)	12,540 pounds.
Lime (CaO)	12,840 pounds.

THE PLATS.

The plats on which these experiments were conducted were embraced in Fields A, B, and C. Fields A and B had been long in cultivation and were badly run down when work was started in 1903. The plats in Field A were laid off in two series parallel to each other, there being twenty plats to the series, with a driveway or turn-row between plats. The plats are one-tenth acre in size, or 217.8 by 20 feet, with space between plats sufficient for two rows of cotton or other crops, the row on either side of each plat being fertilized like the plat which it adjoins.

The plats in Field B were laid out in a similar way and were of the same size.

The plats in Field C were part of an old field, covered with broomsedge, small briars, and small pines in 1903. The pines were grubbed out and the other growth turned under with a two-horse plow in the spring of 1903 and cultivated in corn that year, with a fertilizer application of 300 pounds per acre of the normal corn mixture. In the fall of 1903 crimson clover was sown, but no stand was obtained. The land was prepared in the spring of 1904 and laid off in plats of one-twentieth acre each, the size being 108.9 feet by 20 feet, with space between plats for two extra rows, the rows nearest the plats being fertilized in each case like the plats they adjoin. There is a four-foot space at the ends of the plats. There are two series of sixteen plats each in this field, with driveway or turn-row between.

In the case of all plats on this farm there is a four-foot extra space at the ends of plats.

Field A.—These plats were used for fertilizer experiments with cotton in 1903-'4-'6; for fertilizer experiments with corn in 1905-'7; for general crop of oats without fertilizer in the fall and spring of 1908; for fertilizer experiments with peas in the summer of 1908, and for fertilizer experiments with cotton in 1909. In case of each of the three crops the same plan or system of fertilization was followed. By this is meant that plat one in all cases received only nitrogen, plat two phosphoric acid, plat three potash, and so on, though the quantities actually applied varied with the three crops. The fertilization of the cotton plats was based on a normal application of 400 pounds per acre of a mixture containing 7 per cent available phosphoric acid and 2 per cent each of nitrogen and potash. The fertilization for corn was on basis of 300 pounds per acre of a mixture containing 7 per cent available phosphoric acid, 3 per cent nitrogen, and 1½ per cent potash. For peas the fertilization was based on a normal application of 300 pounds per acre of a mixture containing 8 per cent available phosphoric acid, 1 per cent nitrogen, and 4 per cent potash.

Field B.—These plats were used for fertilizer experiments with corn in 1903, 1904, 1906, and 1908; for fertilizer experiments with cotton in 1905 and 1907; for a general crop of oats without fertilizer in the fall and spring of 1909, and for fertilizer experiments with peas in the summer of 1909.

Field C.—These plats were used for fertilizer experiments with peas in 1904, 1905, 1906, and 1907, a grain crop without fertilization preceding the pea crop in each year except 1904; for fertilizer experiments with cotton in 1908; and for fertilizer experiments with corn in 1909.

PREPARATION AND CULTIVATION.

The land in all cases was well prepared by breaking with a two-horse turning plow in the winter, usually January and February, to a depth of 8 to 10 inches, and allowed to remain this way until just before planting, when it was cut up thoroughly with a disk harrow. The rows were run off 3½ feet apart, the fertilizer distributed in the drill and covered to a slight ridge, usually with one furrow of disk or other cultivator. This was done some time prior to planting, so as to give the ground time to settle before planting. Except the first year (1903), when Culpepper's Improved was used, King's Improved was the variety of cotton grown. The cotton was planted as soon as the weather would permit in the spring, on the slight ridge made in covering the fertilizer, but which was usually brought to a level, or almost to a level, by the cotton planter. The cotton was well cultivated with weeders, harrows, Planet Jr. and two-horse cultivators, requiring not exceeding two furrows to row, making the cultivation deep at beginning and shallow toward the close of the season, when root development of the plants was well extended into the soil. The cultivation was repeated each ten days or two weeks during the season, the crop being laid by between the 15th of July and August 1st, according to season. The cotton was thinned as nearly as possible to one stalk in the hill every 15 inches.

FERTILIZATION AND FERTILIZER MATERIALS USED.

As already stated, the fertilizer was applied in the drill just before planting the cotton, the exact quantity of material for each row being weighed out separately so that each row would get its proper amount of the several fertilizer constituents. Acid phosphate was used as the source of phosphoric acid; dried blood as the source of nitrogen, except where there was a comparison of different nitrogen-furnishing materials, or where nitrate of soda was used as a part of the nitrogen; manure salt as the source of potash, and rock or building lime for lime. The fertilizer materials were analyzed each year and applications made on basis of actual analyses, so as to give the exact quantities of nitrogen, phosphoric acid, and potash required for each plat. For the sake of simplicity and convenience in presenting the results of a number of years' experiments, the fertilizer applications are

expressed in terms of acid phosphate containing 14 per cent available phosphoric acid, dried blood containing 13 per cent nitrogen, nitrate of soda containing 14.8 per cent nitrogen, and manure salt containing 20 per cent potash, which figures represent the average composition of these materials. The fertilizer applications in the fertilizer experiments are on basis of 400 pounds per acre for the normal plat (N P K) of a mixture containing 7 per cent available phosphoric acid and 2 per cent each of nitrogen and potash. Lime is applied at the rate of 500 pounds rock or building lime, or 1,000 pounds slaked lime. The fertilizer applications in the tables, in addition to being represented in terms of acid phosphate, dried blood, nitrate of soda, and manure salt, are also expressed in terms of the symbols, N P K and L, which have the following significance:

N equals nitrogen at the rate of 10 pounds per acre, or 77 pounds of 13 per cent dried blood;

P equals phosphoric acid at the rate of 28 pounds per acre, or 200 pounds of 14 per cent acid phosphate;

K equals potash at the rate of 10 pounds per acre, or 50 pounds 20 per cent manure salt;

L equals lime at the rate of 500 pounds rock or 1,000 pounds slaked lime per acre.

There are columns in the tables showing the exact weights in pounds of phosphoric acid, nitrogen, and potash applied to each plat (expressed on acre basis), which will enable any one to use these same amounts of fertilizer constituents in other materials if desired.

The following average prices which fairly represent the cost of the several materials to the farmer for the period under experimentation have been assumed for the materials used:

14 per cent Acid Phosphate	$14.00 per ton.
13 per cent Dried Blood	60.00 per ton.
14.8 per cent Nitrate of Soda (18 per cent Ammonia)	50.00 per ton.
20 per cent Manure Salt	20.00 per ton.
Rock Lime	10.00 per ton.

The arrangements of the plats and the scheme of fertilizer application is shown by the following:

Normal fertilizer application, 400 pounds per acre of mixture containing—

Phosphoric Acid	7 per cent.
Nitrogen	2½ per cent.
Potash	2½ per cent.

In this normal application—

N equals 10 pounds nitrogen, equals 77 pounds 13 per cent dried blood;

P equals 28 pounds phosphoric acid, equals 200 pounds 14 per cent acid phosphate;
K equals 10 pounds potash, equals 50 pounds 20 per cent manure salt.

SIZE OF PLAT, ONE-TENTH ACRE (217.8 x 20 Feet).

First Series.	*Application.*
1	N
2	P
3	K
4	O
5	N P
6	N K
7	P K
8	N P K
9	N 1½ P K
10	N_2 P K
11	O
12	N_3 P K
13	N $P1\frac{1}{2}$ K
14	N_2 P K
15	N_3 P K
16	N P $K1\frac{1}{2}$
17	N P K_2
18	O
19	N P K_3
20	½ (N P K)

Second Series.	*Application.*	
1^2	$1\frac{1}{2}$ (N P K)	
2^2	2 (N P K)	
3^2	$2\frac{1}{2}$ (N P K)	
4^2	O	
5^2	N P K	Two applications of nitrogen: ½ as blood at planting, ½ as nitrate of soda later.
6^2	N P K	Two applications of nitrogen: ½ as nitrate of soda at planting, ½ as nitrate of soda later.
7^2	N P K	Two applications of nitrogen: ½ as blood at planting, ½ as blood later.
8^2	N P K	Two sources of nitrogen: 1-5 as nitrate of soda at planting, 4-5 as blood at planting.
9^2	N P K	Two applications of fertilizer: ½ at planting, ½ later.
11^2	O	
14^2	Lime	1,000 pounds slaked lime per acre, broadcast every 4th year.
15^2	N P K L	
16^2	N P K	Fertilizer applied broadcast.
18	O	

The above represents the plats in Field A. In Fields B and C they are arranged in a similar way.

WEATHER CONDITIONS DURING 1903-'09, INCLUSIVE.

Besides soil, seed, fertilization, and cultivation, and time of planting, weather conditions, mainly the rainfall, influence the crop yield. In the table presented herewith will be found the monthly and annual rainfall during the years covered by the experiments, the mean monthly and annual rainfall since 1868, and the same data for the months of May to September, inclusive. During the growing months the rainfall in 1903 was below the normal and there was an early frost; good conditions prevailed in 1904; 1905 and 1906 had more than the normal amount of rainfall, and there was an early frost in 1906. The rainfall throughout 1907 and in the growing season was low, and 1908 and 1909 were noted for heavy rainfalls.

RAINFALL IN INCHES AT STATESVILLE.

	1903.	1904.	1905.	1906.	1907.	1908.	1909.	Means of Observations Since 1868.
January	6 43	2 07	2 88	7 23	.05	4.20	.....	3 98
February	9 90	3.87	5.70	1 75	2 16	3.90	.....	4.57
March	8 66	2.46	1.50	6 00	2.75	3.80	.....	5.15
April	7 37	1.55	2 28	1.49	3.85	3.10	.....	3.67
May	.63	2 07	6 78	2.02	3 02	2 04	5.58	3 96
June	4.52	5.74	1 28	6 45	4.74	1.55	10.67	4.36
July	3.55	4 01	8 95	8 68	2.02	9.33	5.96	4.81
August	3 04	6 60	8 75	6 37	3 26	13 27	4 95	5.82
September	5 05	1 31	1 30	3 61	6 05	3.75	1 58	4 19
October	1 08	12	2 06	4.11	1 60	8 15	2 92	3.23
November	1 72	3 71	.35	.80	4 00	1.90	1 11	2 98
December	1 69	3 64	8 09	2 80	6 22	4 60	2.52	4 37
Annual	53 64	37 15	49.91	51 31	39 66	59 59	.....	51 09
Monthly average for May to Sept., inclusive	4 04	4 41	5 07	6 28	1 02	6 97	5.75	4 79

THE RESULTS.

In studying the yields of the several fields it is well to bear in mind that Field A was used continuously during the seven years for cotton and corn, except in 1908, when oats without fertilizer were grown in the spring and followed by a crop of fertilizer experiment peas in the summer. Field B was used continuously for corn and cotton, but had oats and peas in 1909. Field C grew oats and peas, oats without fertilizer and peas in the regular fertilizer experiments in 1904, 1905, 1906, 1907; cotton in 1908, and corn in 1909.

In the future, as during the past three years, the crops will be grown according to the following rotation:

First year.....Cotton;
Second year.....Corn;
Third year .....Small grain and peas.

Each crop has been and will be fertilized according to the scheme outlined in the fertilizer experiments for cotton, corn, small grain, and peas.

The experiments were planned to cover the culture and fertilization of cotton as a whole, but the results of the several subdivisions or phases of the subject are grouped in short tables to facilitate examination and the drawing of conclusions, after which they will be considered as a whole and general conclusions drawn for the fertilization of the crop on this type of soil.

TABLE I—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON; ALONE AND IN COMBINA

RESULTS IN FIELD A IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
1	77 pounds 13% blood=.....N=	10	.....	.....	332.5	365.0
2	200 pounds 14% acid phosphate=.....P=	.....	28	.....	652.5	917.5
3	50 pounds 20% manure salt=.....K=	.....	.....	10	435.0	485.0
4	Unfertilized=.....O=	.....	.....	.....	362.5	342.5
5	77 pounds 13% blood=.....N= 200 pounds 14% acid phosphate=.....P=	10	 28	....	885.0	1230.0
6	77 pounds 13% blood=.....N= 50 pounds 20% manure salt=.....K=	10	....	 10	567.5	570.0
7	200 pounds 14% acid phosphate=.....P= 50 pounds 20% manure salt=.....K=	....	28	 10	832.5	1150.0
8	77 pounds 13% blood=.....N= 200 pounds 14% acid phosphate=.....P= 50 pounds 20% manure salt=.....K=	10	..... 28	 10	925.0	1280.0
14[2]	500 pounds unslaked lime every fourth year=L=	.....	.....	.....	*	*
15[2]	77 pounds 13% blood=.....N= 200 pounds 14% acid phosphate=.....P= 50 pounds 20% manure salt=.....K= 500 pounds unslaked lime every fourth year=L=	10	..... 28	 10	*	*
18[2]	Unfertilized=.....O=	.....	.....	.....	*	*

RESULTS IN 1905 AND

3[2]	77 pounds 13% blood=.....N=	10	.....	.....	.....	.....
4[2]	200 pounds 14% acid phosphate=.....P=	.....	28	.....	.....	.....
5[2]	Unfertilized=.....O=	.....	.....	.....	.....	.....
6[2]	50 pounds 20% manure salt=.....K=	.....	.....	10	.....	.....

*Soil better than that of other plats. Yield too high.
— Loss.

EFFECT OF NITROGEN, PHOSPHORIC ACID, POTASH AND LIME, TION WITH EACH OTHER.

1903, 1904, 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
1	.....	57 5	.....	.....	87.5	210.6	—25 7	$ —1.16	$ 2.31	$ —3.47
2	.....	510 0	.....	.....	542.5	655 6	419.3	18.87	1.40	17.47
3	.....	160 0	.....	.....	125 0	301 3	65 0	2.93	0 50	2 43
4	.....	80.0	.....	.....	160.0	236.3	.....	.....	.....	.....
5	.....	645.0	.....	.....	830.0	897.5	667.4	30.03	3.71	26.32
6	.....	100.00	.....	.....	157.5	348.8	125 0	5.63	2.81	2.82
7	.....	660 0	.....	.....	777.5	855 0	637 5	28.69	1.90	26.79
8	.....	700 0	.....	.....	790 0	923.8	712 5	32.06	4 21	27.85
14[2]	.....	50.0	.....	.....	145.0	97.5	25.0	1.13	0.63	0 50
15[2]	.....	630 0	.....	.....	827.5	728.8	656.3	29.53	4.84	24.69
18[2]	.....	80.0	.....	.....	65.0	72.5	.....	.....	.....	.....
1907 ON FIELD B.										
3[2]	487.5	.....	267.5	.....	.....	377.5	—97.5	—4.39	2.31	—6.70
4[2]	1172.5	.....	622.5	.....	.....	897.5	422.5	19.01	1.40	17.61
5[2]	575.0	.....	375 0	.....	.....	475.0	.....	.....	.....	.....
6[2]	680.0	.....	395.0	.....	.....	537.5	96.3	4.33	0.50	3.83

TABLE I—

RESULTS IN 1905 AND

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
7[2]	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P=	10	28			
8[2]	77 pounds 13% blood=N= / 50 pounds 20% manure salt=K=	10		10		
9[2]	200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=		28	10		
10[2]	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		
4[1]	500 pounds unslaked lime every fourth year=L=					
5[1]	Unfertilized=O=					
6[1]	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K= / 500 pounds unslaked lime every fourth year=L=	10	28	10		

RESULTS IN 1908

1	77 pounds 13% blood=N=	10				
2	200 pounds 14% acid phosphate=P=		28			
3	50 pounds 20% manure salt=K=			10		
4	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P=	10	28			
5	77 pounds 13% blood=N= / 50 pounds 20% manure salt=K=	10		10		
12[2]	200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=		21	10		

Continued.

1907 ON FIELD B.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
7[2]	950.0	.....	505.0	.....	.....	727.5	320 2	$ 14.41	$ 3 71	$ 10 70
8[2]	562.5	.....	250 0	.....	.....	406 3	32.9	1.48	2 81	—1 33
9[2]	1017 5	.....	902 0	.....	.....	959 8	620 3	27 91	1.90	26.01
10[2]	1025 0	.....	980 0	.....	.....	1002.5	696.9	31 36	4 21	27 15
4[3]	185 0	.....	135 0	.....	.....	160 0	—42 5	—1 91	0 68	—2 54
5[3]	220 0	.....	185 0	.....	.....	202.5	.....	.....	.....	.....
6[3]	730 0	.....	545 0	.....	.....	637.5	435 0	19 58	4 84	14 74

IN FIELD C.

1	.....	.....	.....	505.0	.....	505 0	215 0	9.68	2 31	7.37
2	.....	.....	.....	860.0	.....	860.0	570 0	25 65	1.40	24 25
3	.....	.....	.....	435.0	.....	435 0	145 0	6.53	.50	6.03
4	.....	.....	.....	620.0	.....	620.0	330 0	14.85	3.71	11.14
5	.....	.....	.....	400.0	.....	400 0	110 0	4.95	2.81	2 14
12[2]	.....	.....	.....	725.0	.....	725.0	465 0	20.93	1.90	19 03

TABLE I—

RESULTS IN 1908

Number of Plat.	Fertilizer Application per Acre.		Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	Yield of Seed Cotton in Pounds per Acre. 1904.
6	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
8	Unfertilized=	O=					
8[2]	Unfertilized=	O=					
7[2]	500 pounds unslaked lime every fourth year=	L=					
8[2]	Unfertilized=	O=					
9[2]	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
	500 pounds unslaked lime every fourth year=	L=					

AVERAGE RESULTS FOR SEVEN

4-5[2]-8	Unfertilized=	O=					
1-3[2]-1	77 pounds 13% blood=	N=	10				
2-4[2]-2	200 pounds 14% acid phosphate=	P=		28			
4-(5[2]+14[2])-8	Unfertilized=	O=					
3-6[2]-3	50 pounds 20% manure salt=	K=			10		
(4+11)-(5[2]+14[2])-8	Unfertilized=	O=					
5-7[2]-4	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
(4+11)-(5[2]+14[2])-8	Unfertilized=	O=					
6-8[2]-5	77 pounds 13% blood=	N=	10				
	50 pounds 20% manure salt=	K=			10		
(4+11)-(5[2]+14[2])-8	Unfertilized=	O=					

Continued.

IN FIELD C.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
6	.....	.....	.....	1070.0	.....	1070.0	780.0	$ 35 10	$ 4 21	$ 30.89
8	.....	.....	.....	290.0	.....	290.0	.....	.....	.....	.....
8^2	.....	.....	.....	260.0	.....	260.0	.....	.....	.....	.....
7^2	.....	.....	.....	430.0	.....	430 00	170 0	7.65	0.63	7.02
8^2	.....	.....	.....	260.0	.....	260.0	.....	.....	.....	.....
9^2	.....	.....	.....	945.0	.....	945.0	685.0	30.83	4.84	25.99

YEARS ON FIELDS A, B AND C.

$4\text{-}5^2\text{-}8$	.....	.....	.....	.....	.....	312.1	.....	.....	.....	.....
$1\text{-}3^2\text{-}1$	.....	.....	.....	.....	.....	300.4	—11.7	—.53	2 31	—2.84
$2\text{-}4^2\text{-}2$	.....	.....	.....	.....	.....	753.9	441.8	19.88	1.40	18.48
$4\text{-}(5^2+14^2)\text{-}8$	.....	.....	.....	.....	.....	303.2	.....	.....	.....	.....
$3\text{-}6^2\text{-}3$	.....	.....	.....	.....	.....	387.9	85.4	3.84	0 50	3.34
$(4+11)\text{-}(5^2+14^2)\text{-}8$	.....	.....	.....	.....	.....	289.2	.....	.....	.....	.....
$5\text{-}7^2\text{-}4$	.....	.....	.....	.....	.....	809.3	520.1	23.40	3.71	19.69
$(4+11)\text{-}(5^2+14^2)\text{-}8$	.....	.....	.....	.....	.....	276.0	.....	.....	.....	.....
$6\text{-}8^2\text{-}5$	.....	.....	.....	.....	.....	372.5	96.5	4.34	2 81	1.53
$(4+11)\text{-}(5^2+14^2)\text{-}8$	.....	.....	.....	.....	.....	258.4	.....	.....	.....	.....

TABLE I—

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
7-9²-12²	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		
(4+11)-(5²+14²)-8	Unfertilized=O=					
8-10²-6	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		

FIVE YEARS'

18²-5⁴-8²	Unfertilized=O=					
14²-4⁴-7²	500 pounds unslaked lime every fourth year=L=					
15²-6⁴-9²	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		
	500 pounds unslaked lime every fourth year=L=					
(4+11)-(5²+14²)-8	Unfertilized=O=					
8-10²-6	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		

— Loss.

NOTE.—Checks for plats 5, 6, 7 and 8, Field A, and plats 6², 7², 8², 9² and 10², Field B, have been obtained from plats 4 and 11 and 5² and 14² respectively. It has been assumed that

EFFECT OF NITROGEN, PHOSPHORIC ACID, POTASH AND LIME ALONE AND IN COMBINATION WITH EACH OTHER ON COTTON YIELDS.

The experiments, the results of which are presented in Table 1, were planned to determine the effect on yield of cotton of nitrogen (N), phosphoric acid (P) and potash (K) when applied singly; when two of the constituents were applied together, as nitrogen and phosphoric acid (N P), nitrogen and potash (N K), and phosphoric

Continued.

YEARS ON FIELDS A, B AND C.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
$7\text{-}9^2\text{-}12^2$						866.4	608 0	$ 27.36	$ 1.90	$ 25 46
$(4+11)\text{-}(5^2+14^2)\text{-}8$						249 4				
$8\text{-}10^2\text{-}6$						967.1	717.7	32.30	4 21	28 09
AVERAGES.										
$18^2\text{-}5^4\text{-}8^2$						162 0				
$14^2\text{-}4^4\text{-}7^2$						189 0	27 0	1.22	0.63	.59
$15^2\text{-}6^4\text{-}9^2$						735 5	573.5	25 81	4 84	20 97
$(4+11)\text{-}(5^2+14^2)\text{-}8$						206 2				
$8\text{-}10^2\text{-}6$						912.9	706.7	31.60	4 21	27.59

there is a uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

acid and potash (P K), and when all three of the fertilizing constituents were applied to make a complete fertilizer (N P K); also to test the effect of lime (L) when used alone and when used in connection with a complete fertilizer (N P K L). The results are shown in yields of seed cotton per acre for the several years, average yields, average increases over the unfertilized (O) plats which represent the effect of the fertilizer applications, the value of increase, cost of the fertilizer, and value of the increased yields over cost of fertilizer.

Nitrogen, N (Plats 1, 3^2 and 1). The average results during six years on the plats in Fields A and B show decreased yields and value of product, while for one year in Field C there was a gain from the use of nitrogen, the average results for the plats in the three fields during the seven years being an actual loss in both yield and value of product from the application of nitrogen alone. The loss was $2.84 annually.

Phosphoric Acid, P (Plats 2, 4^2 and 2). Phosphoric acid alone produced increased yields in all of the seven years on the plats in the three fields, the average increase for four years in Field A being 419.3 pounds of seed cotton; for two years in Field B 422.5 pounds; and for one year in Field C 570 pounds, or an average for the seven years in all three fields of 441.8 pounds, worth at 4½ cents per pound $18.48 per acre annually over cost of fertilizer.

Potash, K (Plats 3, 6^2 and 3). From potash alone the average increased yields in the three fields were 65, 96.3, and 145 pounds of seed cotton respectively, or an average of 85.4 pounds for all three fields for the seven years, valued at $3.34 annually over the cost of fertilizer.

Nitrogen and Phosphoric Acid, N P (Plats 5, 7^2 and 4). Nitrogen and phosphoric acid alone gave increased yields over the unfertilized plats for all seven years on the plats in the three fields, the annual average increase for the four years in Field A being 667.4 pounds; for two years in Field B 320.2 pounds; and for one year in Field C 330 pounds, or an average annual increase for seven years in three fields of 520.1 pounds, worth $19.69 over the cost of fertilizer. This is $1.21 more than the value of the increase produced by phosphoric acid alone, showing that nitrogen has added but little to the yield and profit over what phosphoric acid alone gave.

Nitrogen and Potash, N K (Plats 6, 8^2 and 5). From an application of nitrogen and potash combined there were small average increased yields on all plats in the three fields, the average for the seven years being 96.5 pounds of seed cotton, worth $1.53 over cost of fertilizer, which is $1.81 less than the average for potash alone.

Phosphoric Acid and Potash, P K (Plats 7, 9^2 and 12^2). Phosphoric acid and potash combined gave increased yields on all the plats in the three fields, the average annual increase for four years in Field A being 637.5 pounds; for two years in Field B 620.3 pounds; and for one year in Field C 465 pounds, or an average for the seven years in the three fields of 608 pounds, worth $25.46 over cost of fertilizer, which is $6.98 more than the average value of increase from phosphoric acid alone.

Phosphoric Acid, Potash, and Nitrogen, N P K (Plats 8, 10^2 and 6). These three materials combined in a complete fertilizer gave increased yields in all the tests on all the plats in three fields, the

annual average increase for four years in Field A being 712.5 pounds of seed cotton; for two years in Field B 696.9 pounds; and for one year in Field C 780 pounds, or an annual average increase per acre for the seven years in three fields of 717.7 pounds, worth $28.09 over cost of fertilizer.

Lime, L (Plats 14^2, 4^4 and 7^2). Lime was applied at the rate of 500 pounds of rock or 1,000 pounds slaked lime per acre every fourth year. On plat in Field A during two years there was a profit of 50 cents per acre from use of lime alone; on plat in Field B in two years' experiments a loss of $2.54 annually per acre; and on the plat in Field C in a one year's test a profit of $7.02, or an average for the seven years of a net profit of 59 cents annually per acre.

Lime with Complete Fertilizer, N P K L (Plats 15^2, 6^4 and 9^2). Where lime was used in combination with the three fertilizer constituents there was less cotton produced on all the plats in all three of the fields than where the three fertilizer constituents were used without lime, showing a net loss in the use of lime in combination with a complete fertilizer for the production of cotton on this soil.

Taking the experiments as a whole, the average results show that nitrogen alone on this soil for the production of cotton was used at a loss;

Potash alone gave a small profit; nitrogen and potash combined less by practically one-half than potash alone;

Lime alone had very little effect on the yield;

Phosphoric acid alone gave a large increase in yield and profit (practically two-thirds as large as nitrogen, phosphoric acid, and potash combined);

Nitrogen combined with phosphoric acid added but slightly to the increased yields;

Potash added to phosphoric acid gave profitable returns;

Nitrogen added to phosphoric acid and potash was at a small profit, and the yields from lime added to nitrogen, phosphoric acid, and potash were smaller than for the three fertilizer constituents combined.

The main increased yields and profits, therefore, came from phosphoric acid; the next most profitable constituent was potash, nitrogen being of no value except where used in combination with phosphoric acid and potash, and the profit from its use then was not large. It will be well to bear these facts in mind for comparison with the results presented in the tables to follow.

TABLE II—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON;

RESULTS IN FIELD A IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
9	38.5 pounds 13% blood=½N=	5				
	200 pounds 14% acid phosphate=P=		28		867.5	1197.5
	50 pounds 20% manure salt=K=			10		
(4+11)	Unfertilized=O=				372.5	339 6
8	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28		925.0	1280.0
	50 pounds 20% manure salt=K=			10		
10	154 pounds 13% blood=2N=	20				
	200 pounds 14% acid phosphate=P=		28		770 0	1240.0
	50 pounds 20% manure salt=K=			10		
11	Unfertilized=O=				380.0	337.5
12	231 pounds 13% blood=3N=	30				
	200 pounds 14% acid phosphate=P=		28		780.0	1070.0
	50 pounds 20% manure salt=K=			10		

RESULTS IN FIELD B

11[2]	38.5 pounds 13% blood=½N=	5				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		
(5[2]+14[2])	Unfertilized=O=					
10[2]	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		
12[2]	154 pounds 13% blood=2N=	20				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		

EFFECT OF VARYING QUANTITIES OF NITROGEN ON YIELDS.

1903, 1904, 1906, 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
9	.....	665 0	.....	.....	962.5	923.1	718.1	$ 32.31	$ 3.06	$ 29.25
(4+11)	.....	51.6	.....	.....	81 4	211 2	.....	.....	.....	.....
8	.....	700.0	.....	.....	790.0	923 8	712.5	32.06	4.21	27 85
10	.....	607.5	.....	.....	885.0	875 0	676.8	30.46	6.52	23.94
11	.....	30.0	.....	.....	22 5	192.5	.....	.....	.....	.....
12	.....	402.0	.....	.....	880.0	783.0	590.5	26.57	8.83	17.74

IN 1905 AND 1907.

11[2]	1050.0	.....	960.0	.....	.....	1005.0	733.3	33.00	3.06	29.94
(5[2]+14[2])	365.5	.....	244.0	.....	.....	305.6	.....	.....	.....	.....
10[2]	1025.0	.....	980.0	.....	.....	1002.5	696.9	31.36	4.21	27.15
12[2]	1225.0	.....	990 0	.....	.....	1108 0	870.2	39.16	6.52	32.64

TABLE II—

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.		Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
13[2]	231 pounds 13% blood=	3N=	30				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
14[2]	Unfertilized=	O=					

RESULTS IN FIELD

7	38.5 pounds 13% blood=	½N=	5				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
8	Unfertilized=	O=					
6	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
8	Unfertilized=	O=					
9	154 pounds 13% blood=	2N=	20				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
10	231 pounds 13% blood=	3N=	30				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		

AVERAGE RESULTS FOR SEVEN

(4+11)-(5²+14²)-8	Unfertilized=	O=					
9-11²-7	38.5 pounds 13% blood=	½N=	5				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
(4+11)-(5²+14²)-8	Unfertilized=	O=					

Continued.

IN 1905 AND 1907.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
13^2	1282.5	.....	795.0	.....	.....	1038.8	834.9	$ 37.57	$ 8.83	$ 28.74
14^2	197.5	.....	142.5	.....	.....	170.0	.....	.....	.....	.....

C IN 1908.

7	.....	.....	.....	1110.0	.....	1110.0	820.0	36.90	3.06	33.84
8	.....	.....	.....	290.0	.....	290.0	.....	.....	.....	.....
6	.....	.....	.....	1070.0	.....	1070.0	780.0	35.10	4.21	30.89
8	.....	.....	.....	290.0	.....	290.0	.....	.....	.....	.....
9	.....	.....	.....	1285.0	.....	1285.0	995.0	44.78	6.52	38.26
10	.....	.....	.....	1145.0	.....	1145.0	855.0	38.48	8.83	29.65

YEARS IN FIELDS A, B AND C.

$(4+11)-(5^2+14^2)-8$	.....	.....	.....	.....	.....	236.2	.....	.....	.....	.....
$9-11^2-7$	.....	.....	.....	.....	.....	973.2	737.0	33.17	3.06	30.11
$(4+11)-(5^2+14^2)-8$	.....	.....	.....	.....	.....	249.4	.....	.....	.....	.....

TABLE II—

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre.	
					1903.	1904.
$8\text{-}10^2\text{-}6$	77 pounds 13% blood=.....N=	10	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....	.....	.....
	50 pounds 20% manure salt=.....K=	.....	.....	10		
$(4+11)\text{-}(5^2+14^2)\text{-}8$	Unfertilized=.....O=	.....	.....	.....	.....	.....
$10\text{-}12^2\text{-}9$	154 pounds 13% blood=.....2N=	20	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....	.....	.....
	50 pounds 20% manure salt=.....K=	.....	.....	10		
$11\text{-}(5^2+14^2)\text{-}8$	Unfertilized=.....O=	.....	.....	.....	.....	.....
$12\text{-}13^2\text{-}10$	231 pounds 13% blood=.....3N=	30	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....	.....	.....
	50 pounds 20% manure salt=.....K=	.....	.....	10		

NOTE.—Checks for plats 8, 9 and 10, Field A, and plats 10^2, 11^2, 12^2 and 13^2, Field B, have been obtained from plats 4 and 11 and 5^2 and 14^2 respectively. It has been assumed that

EFFECT OF VARYING QUANTITIES OF NITROGEN.

These tests (Table II) were planned to determine the effect on the yield of cotton of varying quantities of nitrogen, leaving the phosphoric acid and potash constant. On one plat the nitrogen was reduced to one-half of the normal quantity, making the application 5 pounds of nitrogen per acre or practically 1¼ per cent in the fertilizer mixture. On two of the plats it was increased by 2 and 3 times the normal quantity (10 pounds per acre), making the application 20 and 30 pounds per acre respectively, or on basis of the fertilizer mixture 5 and 7½ per cent. The average results for four years on plats in Field A show the largest yield and profit from the fertilizer application containing one-half the normal or the smallest quantity of nitrogen in the several mixtures. In two years' and one year's test

Continued.

YEARS IN FIELDS A, B AND C.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
$8\text{-}10^2\text{-}6$						967.1	717.7	$ 32.30	$ 4.21	$ 28.09
$(4+11)\text{-}(5^2+14^2)\text{-}8$						222.9				
$10\text{-}12^2\text{-}9$						1000.4	777.5	34.99	6.52	28.47
$11\text{-}(5^2+14^2)\text{-}8$						209.7				
$12\text{-}13^2\text{-}10$						907.8	698.1	31.41	8.83	22.58

there is a uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

respectively, on Fields B and C, the largest profits were obtained from the plats receiving fertilizer application containing twice the normal quantity of nitrogen in the mixture, or 20 pounds of nitrogen per acre.

Taking the seven years' experiments together, the average results show an average increased yield over unfertilized plats of 737 pounds of seed cotton, worth $30.11 for the fertilizer application containing one-half the normal quantity of nitrogen ($N\frac{1}{2}$ P K), (this equals 5 pounds nitrogen per acre), and 777.5 pounds, worth $28.47 for the fertilizer application containing twice the normal quantity of nitrogen (N_2 P K). (This equals 20 pounds nitrogen per acre.)

These results indicate, as do those in the preceding table, that nitrogen is not the most important or controlling constituent for the production of cotton on this soil.

TABLE III—RESULTS OF FERTILIZER EXPERIMENTS WITH COT

RESULTS IN FIELD A

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
13	77 pounds 13% blood=N= 100 pounds 14% acid phosphate=½P= 50 pounds 20% manure salt=K=	10	14	10	*	*
4+11	Unfertilized=O=					
8	77 pounds 13% blood=N= 200 pounds 14% acid phosphate=P= 50 pounds 20% manure salt=K=	10	28	10		
14	77 pounds 13% blood=N= 400 pounds 14% acid phosphate=2P= 50 pounds 20% manure salt=K=	10	56	10	*	*
15	77 pounds 13% blood=N= 600 pounds 14% acid phosphate=3P= 50 pounds 20% manure salt=K=	10	84	10	*	*
18	Unfertilized=O=				*	*

RESULTS IN FIELD B

14[2]	Unfertilized=O=					
15[2]	77 pounds 13% blood=N= 100 pounds 14% acid phosphate=½P= 50 pounds 20% manure salt=K=	10	14	10		
5[2]+14[2]	Unfertilized=O=					
10[2]	77 pounds 13% blood=N= 200 pounds 14% acid phosphate=P= 50 pounds 20% manure salt=K=	10	28	10		
1[2]	77 pounds 13% blood=N= 100 pounds 14% acid phosphate=2P= 50 pounds 20% manure salt=K=	10	56	10		

TON; EFFECT OF VARYING QUANTITIES OF PHOSPHORIC ACID.

IN 1903, 1904, 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
13	.....	467.5	.....	.....	737.5	602.5	285.0	$ 12.83	$ 3.51	$ 9.32
(4+11)	.....	51.6	.....	.....	81.4	66.5	.....	.....	.....	.....
8	.....	700.0	.....	.....	790.0	745.0	678.5	30.53	4.21	26.32
14	.....	462.5	.....	.....	1080.0	771.3	453.8	20.42	5.61	14.81
15	.....	700.0	.....	.....	1120.0	910.0	592.5	26.56	7.01	19.55
18	.....	375.0	.....	.....	260.0	317.5	.....	.....	.....	.....

IN 1905 AND 1907.

14[2]	197.5	.....	142.5	.....	.....	170.0	.....	.....	.....	.....
15[2]	950.0	.....	785.0	.....	.....	867.5	697.5	31.39	3.51	27.88
(5[2]+14[2])	365.5	.....	244.0	.....	.....	305.6	.....	.....	.....	.....
10[2]	1025.0	.....	980.0	.....	.....	1002.5	696.9	31.36	4.21	27.15
1[2]	1347.5	.....	807.5	.....	.....	1077.5	857.5	38.59	5.61	32.98

TABLE III—

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.		Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
2^3	77 pounds 13% blood=	N=	10				
	600 pounds 14% acid phosphate=	3P=		84			
	50 pounds 20% manure salt=	K=			10		
5^3	Unfertilized=	O=					

RESULTS IN

11	77 pounds 13% blood=	N=	10				
	100 pounds 14% acid phosphate=	½P=		14			
	50 pounds 20% manure salt=	K=			10		
6	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
12	77 pounds 13% blood=	N=	10				
	400 pounds 14% acid phosphate=	2P=		56			
	50 pounds 20% manure salt=	K=			10		
13	77 pounds 13% blood=	N=	10				
	600 pounds 14% acid phosphate=	3P=		84			
	50 pounds 20% manure salt=	K=			10		
8	Unfertilized=	O=					

AVERAGE RESULTS FOR 5

$18\text{-}14^2\text{-}8$	Unfertilized=	O=					
$13\text{-}15^2\text{-}11$	77 pounds 13% blood=	N=	10				
	100 pounds 14% acid phosphate=	½P=		14			
	50 pounds 20% manure salt=	K=			10		
$(4+11)\text{-}(5^2+14^2)\text{-}8$	Unfertilized=	O=					
$8\text{-}10^2\text{-}6$	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		

Continued.

IN 1905 AND 1907.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
2^3	1525 0	.....	860.0	.....	.....	1192.5	972.5	$ 43 76	$ 7.01	$ 36.75
5^3	305.0	.....	135.0	.....	.....	220.0	.....	.....	.....	.....

FIELD C IN 1908.

11	.....	.....	.....	875.0	.....	875.0	585.0	26.33	3.51	22.82
6	.....	.....	.....	1070.0	.....	1070.0	780.0	35.10	4.21	30.89
12	.....	.....	.....	925.0	.....	925.0	635.0	28.58	5.61	22.97
13	.....	.....	.....	795.0	.....	795.0	505.0	22.73	7.01	15.72
8	.....	.....	.....	290.0	.....	290.0	.....	.....	.....	.....

YEARS IN FIELDS A, B AND C.

$18\text{-}14^2\text{-}8$	.....	.....	.....	.....	.....	253.0	.....	.....	.....	.....
$13\text{-}15^2\text{-}11$	.....	.....	.....	.....	.....	763.0	420.0	18.90	3.51	19.44
$(4+11)\text{-}(5^2+14^2)\text{-}8$	.....	.....	.....	.....	.....	206.2	.....	.....	.....	.....
$8\text{-}10^2\text{-}6$	.....	.....	.....	.....	.....	912.9	706.7	31.80	4.21	27.59

TABLE III—

AVERAGE RESULTS FOR 5

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
18-5[3]-S	Unfertilized=.....O=					
14-1[3]-S	77 pounds 13% blood=.....N=	10				
	400 pounds 14% acid phosphate=.....2P=		56			
	50 pounds 20% manure salt=.....K=			10		
15-2[3]-S	77 pounds 13% blood=.....N=	10				
	600 pounds 14% acid phosphate=.....3P=		84			
	50 pounds 20% manure salt=.....K=			10		

*Soil better than other plats; yields too high.

NOTE.—Checks for plat 8, field A, and plat 10^2, field B, have been obtained from plats 4 and 11, and 5^2 and 14^2 respectively. It has been assumed that there is a uniform increase

EFFECT OF VARYING QUANTITIES OF PHOSPHORIC ACID.

The above experiments (in Table III) were planned to show the effect on the yields of seed cotton of varying quantities of phosphoric acid, the nitrogen and potash remaining the same. On one plat one-half the normal quantity of phosphoric acid was applied, or an amount represented by 100 pounds of 14 per cent acid phosphate and equivalent to 3½ per cent phosphoric acid in the fertilizer mixture. On two plats were applied two and three times the normal quantities of phosphoric acid, represented by 400 and 600 pounds of 14 per cent acid phosphate respectively, or 56 and 84 pounds of phosphoric acid per acre. The yields show good profits for all of the fertilizer mixtures, but the results are variable and do not indicate clearly what is

Continued.

YEARS IN FIELDS A, B AND C.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
18-5^3-S						273.0		$	$	$
14-1^3-S						924.5	651.0	29.30	5.61	23.69
15-2^3-S						1000.0	727.0	32.72	7.01	25.71

or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

the most profitable quantity of phosphoric acid to use for cotton on this soil, as the results previously reported (JUNE, 1910, BULLETIN) did for peas. The results on all of the fields, as well as the averages, show that one-half the normal quantity of phosphoric acid is not sufficient for best returns. The largest average increased yield of seed cotton was from the heavy application of acid phosphate (600 pounds per acre) along with the normal quantities of potash and nitrogen, though the largest profit, when cost of fertilizer is considered, was from the normal fertilizer application containing 200 pounds of acid phosphate. The experiments are being continued according to the same plan on these several fields and the results from year to year will no doubt throw additional light on this, as well as other phases of the problem of the best and most profitable fertilization for cotton.

TABLE IV—RESULTS OF FERTILIZER EXPERIMENTS WITH

RESULTS IN FIELD

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
16	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 25 pounds 20% manure salt=½K=	10	28	5	*	*
(4+11)	Unfertilized=O=					
8	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		
17	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 100 pounds 20% manure salt=2K=	10	28	20	*	*
18	Unfertilized=O=				*	*
19	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 150 pounds 20% manure salt=3K=	10	28	30	*	*

RESULTS IN FIELD

3[3]	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 25 pounds 20% manure salt=½K=	10	28	5		
(5[2]+14[2])	Unfertilized=O=					
10[2]	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		
4[3]	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 100 pounds 20% manure salt=2K=	10	28	20		
5[3]	Unfertilized=O=					

COTTON; EFFECT OF VARYING QUANTITIES OF POTASH.

A IN 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
16	.....	635.0	.....	.....	850 0	742.5	425.0	$ 19.13	$ 3.96	$ 15.17
(4+11)	.....	51.6	.....	.....	81.4	66.5	.....	.....	.....	.....
8	.....	700.0	.....	.....	790.0	745.0	678.5	30.53	4.21	26.32
17	.....	825.0	.....	.....	952.5	888.8	571.3	25.71	4.71	21.00
18	.....	375.0	.....	.....	260.0	317.5	.....	.....	.....	.....
19	.....	730.0	.....	.....	855.0	792.5	475.0	21.38	5.21	16.17

B IN 1905 AND 1907.

3^3	860.0	.....	600.0	.....	.....	730.0	510.0	22.95	3.96	18.99
(5^2+14^2)	365.5	.....	244.0	.....	.....	305.6	.....	.....	.....	.....
10^2	1025.0	.....	980.0	.....	.....	1002.5	696.9	31.36	4.21	27.15
4^3	935.0	.....	870.0	.....	.....	902.5	682.5	30.71	4.71	26.00
5^3	305.0	.....	135.0	.....	.....	220.0	.....	.....	.....	.....

TABLE IV—

RESULTS IN FIELD

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
6[3]	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	150 pounds 20% manure salt=3K=			30		

RESULTS IN FIELD

14	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	25 pounds 20% manure salt=½K=			5		
6	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		
15	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	100 pounds 20% manure salt=2K=			20		
16	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	150 pounds 20% manure salt=3K=			30		
8	Unfertilized=O=					

AVERAGE RESULTS FOR 5

18-5[3]-8	Unfertilized=O=					
16-3[3]-14	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	25 pounds 20% manure salt=½K=			5		
(4+11)-(5[2]+14[2])-8	Unfertilized=O=					
8-10[2]-6	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		

Continued.

B IN 1905 AND 1907.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
6[3]	972.5	.....	862.5	.....	.....	917.5	713.6	$ 32.11	$ 5.21	$ 26.90
C IN 1908.										
14	.....	.....	.....	850.0	.....	850.0	560.0	25.20	3.96	21.24
6	.....	.....	.....	1070.0	.....	1070.0	780.0	35.10	4.21	30.89
15	.....	.....	.....	952.5	.....	952.5	662 5	29.81	4.71	25.10
16	.....	.....	.....	855 0	.....	855.0	565.0	25.43	5.21	20.22
8	.....	.....	.....	290.0	.....	290.0	.....	.....	.....	.....
YEARS IN FIELDS A, B AND C.										
18-5[3]-8	.....	.....	.....	.....	.....	273.0	.....	.....	.....	.....
16-3[3]-14	.....	.....	.....	.....	.....	759.0	486.0	21.87	3.96	17.91
(4+11)-(5[2]+14[2])-8	.....	.....	.....	.....	.....	206.2	.....	.....	.....	.....
8-10[2]-6	.....	.....	.....	.....	.....	912.9	706.7	31.80	4.21	27.59

TABLE IV—

AVERAGE RESULTS FOR 5

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
17-4[3]-15	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	100 pounds 20% manure salt=2K=			20		
18-(5[3]+14[3])-8	Unfertilized=O=					
19-6[3]-16	77 pounds 13% blood=N=	10				
	200 pounds 14% acid phosphate=P=		28			
	150 pounds 20% manure salt=3K=			30		

*Soil better than other plats; yields too high.

NOTE.—The check for plat 8, field A, has been obtained from plats 4 and 11; that for plat 10[2], field B, from plats 5[2] and 14[2]; and for plat 6[3], field B, from plats 5[3] and 14[3]. It has been

EFFECT OF VARYING QUANTITIES OF POTASH.

The experiments reported in Table IV were arranged to show the effect on the yield of seed cotton of varying quantities of potash, the nitrogen and phosphoric acid remaining constant. On one plat only one-half the normal quantity of potash was applied, or 1¼ per cent in the fertilizer mixture, or 5 pounds of potash per acre, while on two other plats two and three times the normal quantities were given, or 20 and 30 pounds of actual potash per acre respectively. On basis of the normal fertilizer mixture this would represent 5 and 7½ per cent of potash in the mixture.

TABLE V—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON;

RESULTS IN FIELD A

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
18	Unfertilized=O=				*	*
20	38.5 pounds 13% blood=½N=	5				
	100 pounds 14% acid phosphate=½P=		14		*	*
	25 pounds 20% manure salt=½K=			5		

Continued.

YEARS IN FIELDS A, B AND C.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
17-4^3-15	.....	.....	.....	.....	.....	907.0	634.0	$ 28.53	$ 4.71	$ 23.82
18-(5^3+ 14^3)-8	.....	.....	.....	.....	.....	266.5	.....	.....	.....	.....
19-6^3-16	.....	.....	.....	.....	.....	855.0	588.5	26.48	5.21	21.27

assumed that there is a uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

The results are quite uniform in all three of the fields, indicating that 1¼ per cent in the mixture, or 5 pounds of potash per acre, is not sufficient for the most profitable yield of cotton on this soil, when used in connection with the regular quantities of nitrogen and phosphoric acid employed in the mixtures. The largest average increase in yield of cotton, as well as the greatest profit, was obtained from the plats receiving the normal quantity of potash, which was 2½ per cent in the mixture, or 10 pounds to the acre. This quantity is supplied by 50 pounds of 20 per cent manure salt.

EFFECT OF VARYING QUANTITIES OF FERTILIZER ON YIELDS.

IN 1904, 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Annual Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
18	.....	375.0	.....	.....	260.0	317.5	.....	$.....	$.....	$.....
20	.....	790.0	.....	.....	725.0	757.5	440.0	19.80	2.11	17.69

TABLE V—

RESULTS IN FIELD A

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
(4+11)	Unfertilized=O=					
8	77 pounds 13% blood=N= 200 pounds 14% acid phosphate=P= 50 pounds 20% manure salt=K=	10	28	10		
1[3]	115.5 pounds 13% blood=1½N= 300 pounds 14% acid phosphate=1½P= 75 pounds 20% manure salt=1½K=	15	42	15		
2[3]	154 pounds 13% blood=2N= 400 pounds 14% acid phosphate=2P= 100 pounds 20% manure salt=2K=	20	56	20		
3[3]	192.5 pounds 13% blood=2½N= 500 pounds 14% acid phosphate=2½P= 125 pounds 20% manure salt=2½K=	25	70	25		1250.0
4[3]	Unfertilized=O=					210.0

RESULTS IN FIELD

5[3]	Unfertilized=O=					
7[3]	38.5 pounds 13% blood=½N= 100 pounds 14% acid phosphate=½P= 25 pounds 20% manure salt=½K=	5	14	5		
(5[2]+14[2])	Unfertilized=O=					
10[2]	77 pounds 13% blood=N= 200 pounds 14% acid phosphate=P= 50 pounds 20% manure salt=K=	10	28	10		
8[3]	115.5 pounds 13% blood=1½N= 300 pounds 14% acid phosphate=1½P= 75 pounds 20% manure salt=1½K=	15	42	15		
9[3]	154 pounds 13% blood=2N= 400 pounds 14% acid phosphate=2P= 100 pounds 20% manure salt=2K=	20	56	20		

Continued.

IN 1904, 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
(4+11)	.....	51.6	.....	.....	81.4	66.5	.....	$.....	$.....	$.....
8	.....	700.0	.....	.....	790.0	745.0	678.5	30.53	4.21	26.32
1[2]	.....	550.0	.....	.....	740.0	645.0	570.0	25.65	6.32	19.33
2[2]	.....	590.0	.....	.....	902.5	746.3	671.3	30.21	8.42	21.79
3[2]	.....	750.0	.....	.....	†1205.0	1068.0	948.0	42.66	10.53	32.13
4[2]	.....	60.0	.....	.....	90.0	75.0 120.0	.....	.....	.....	.....
B IN 1906 AND 1909.										
5[3]	305.0	.....	135.0	.....	.....	220.0	.....	.....	.....	.....
7[3]	587.5	.....	465.0	.....	.....	526.3	338.5	15.23	2.11	13.12
(5[2]+14[2])	365.5	.....	244.0	.....	.....	305.6	.....	.....	.....	.....
10[2]	1025.0	.....	980.0	.....	.....	1002.5	696.9	31.36	4.21	27.15
8[3]	1527.5	.....	957.0	.....	.....	1242.3	1070.6	48.18	6.32	41.86
9[3]	1460.0	.....	1075.0	.....	.....	1267.5	1112.0	50.04	8.42	41.62

TABLE V—

RESULTS IN FIELD

Number of Plat.	Fertilizer Application per Acre.		Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
10^3	192.5 pounds 13% blood=	$2\frac{1}{2}N$=	25				
	500 pounds 14% acid phosphate=	$2\frac{1}{2}P$=		70			
	125 pounds 20% manure salt=	$2\frac{1}{2}K$=			25		
14^3	Unfertilized=	O=					

RESULTS IN FIELD

1^2	38.5 pounds 13% blood=	$\frac{1}{2}N$=	5				
	100 pounds 14% acid phosphate=	$\frac{1}{2}P$=		14			
	25 pounds 20% manure salt=	$\frac{1}{2}K$=			5		
6	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		
2^2	115.5 pounds 13% blood=	$1\frac{1}{2}N$=	15				
	300 pounds 14% acid phosphate=	$1\frac{1}{2}P$=		42			
	75 pounds 20% manure salt=	$1\frac{1}{2}K$=			15		
3^2	154 pounds 13% blood=	2N=	20				
	400 pounds 14% acid phosphate=	2P=		56			
	100 pounds 20% manure salt=	2K=			20		
8^2	Unfertilized=	O=					

AVERAGE RESULTS FOR 5 YEARS

$18-(5^3+14^3)-8^2$	Unfertilized=	O=					
$20-7^3-1^2\dagger$	38.5 pounds 13% blood=	$\frac{1}{2}N$=	5				
	100 pounds 14% acid phosphate=	$\frac{1}{2}P$=		14			
	25 pounds 20% manure salt=	$\frac{1}{2}K$=			5		
$(4+11)-(5^2+14^2)-8$	Unfertilized=	O=					
$8-10^2-6$	77 pounds 13% blood=	N=	10				
	200 pounds 14% acid phosphate=	P=		28			
	50 pounds 20% manure salt=	K=			10		

Continued.

B IN 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
10^3	1607.0	.....	1092.5	.....	.....	1349.8	1210.4	$ 54 47	$10.53	$ 43 94
14^3	100.0	.....	50.0	.....	.....	75.0	.....	.....	.....	.....
C IN 1908.										
1^2	.....	.....	.....	715.0	.....	715.0	455.0	20.48	2.11	18 37
6	.....	.....	.....	1070.0	.....	1070.0	780 0	35.10	4 21	30.89
2^2	.....	.....	.....	1270 0	.....	1270.0	1010.0	45.45	6.32	39.13
3^2	.....	.....	.....	1390.0	.....	1390.0	1130 0	50.85	8 42	42.43
8^2	.....	.....	.....	260.0	.....	260.0	.....	.....	.....	.....
IN FIELDS A, B AND C.										
$18-(5^3+14^3)-8^2$	.....	.....	.....	.....	.....	254.1	.....	.....	.....	.....
$20-7^3-1^2$ ‡	.....	.....	.....	.....	.....	656.5	402.4	18.11	2.11	16.00
$(4+11)-(5^2+14^2)-8$	.....	.....	.....	.....	.....	206.2	.....	.....	.....	.....
$8-10^3-6$	.....	.....	.....	.....	.....	912.9	706.7	31.80	4 21	27.5

TABLE V—

AVERAGE RESULTS FOR 5 YEARS

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
4^2-(5^3+ 14^3)-8^2	Unfertilized=.....O=					
1^2-8^3-2^2	115.5 pounds 13% blood=.....1½N=	15				
	300 pounds 14% acid phosphate=.....1½P=		42			
	75 pounds 20% manure salt=.....1½K=			15		
4^2-(5^3+ 14^3)-8^2	Unfertilized=.....O=					
2^2-9^3-3^2	154 pounds 13% blood=.....2N=	20				
	400 pounds 14% acid phosphate=.....2P=		56			
	100 pounds 20% manure salt=.....2K=			20		
4^2-(5^3+ 14^3)	Unfertilized=.....O=					
3^2-10^3	192.5 pounds 13% blood=.....2½N=	25				
	500 pounds 14% acid phosphate=.....2½P=		70			
	125 pounds 20% manure salt=.....2½K=			25		

*Soil better than other plats; yields too high. †Three times normal quantity of fertilizer applied this year, 3(NPK). ‡This average is for years 1904, 1905, 1906, 1907 and 1909.

NOTE.—The check for plat 8, field A, has been obtained from plats 4 and 11; that for plat 10^2, field B from plats 5^2 and 14^2, and for plats 7^3, 8^3, 9^3 and 10^3, field B, from plats 5^3 and 14^3. It has been assumed that there is a uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

EFFECT OF VARYING QUANTITIES OF FERTILIZER ON YIELDS.

The experiments in Table V were planned to show the effect of increasing and decreasing the normal (N P K equals 400 pounds of a fertilizer mixture containing 7 per cent phosphoric acid, 2½ per cent potash and 2½ per cent nitrogen) fertilizer application on the yields. The applications were at the rate of 200 pounds per acre (½ N P K); 400 pounds per acre, N P K; 600 pounds per acre (1½ N P K); 800 pounds per acre (2 N P K); 1,000 pounds per acre (2½ N P K). The results on the several fields and the averages of the three fields are quite uniform in showing increased yields and increased profits for the several increases in the amounts of fertilizer, the quantity of fertilizer per acre varying from 200 to 1,000 pounds. The largest yields, as well as the greatest profit, were obtained from the 1,000-pound application. It is possible that the limit of the most profitable fertilization for cotton on this soil has

Continued.

IN FIELDS A, B AND C.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
4^2-(5^3+14^3)-8^2	.....	.....	.....	.....	.....	150.7	.....	$.....	$.....	$.....
1^2-8^3-2^2	.....	.....	.....	.....	.....	1008.9	858.2	38.62	6.32	32.30
4^2-(5^3+14^3)-8^2	.....	.....	.....	.....	.....	144.3	.....	.....	.....	.....
2^2-9^3-3^2	.....	.....	.....	.....	.....	1083.5	939.2	42.26	8.42	33.84
4^2-(5^3+14^3)	.....	.....	.....	.....	.....	‡127.8	.....	.....	.....	.....
3^2-10^3	.....	.....	.....	.....	.....	‡1180.9	1053.1	47.39	10.53	36.86

not been reached, and that more than 1,000 pounds per acre would give remunerative returns. Additional experiments have been put out this year (1910) to test this, the quantity running up to 1,800 pounds per acre.

In addition to larger profits from heavy fertilization of the right kind, the land is in all probability improving in productiveness and value. Results on these plats and fields in after years will be most valuable in throwing light on this most important phase of the proper fertilization for immediate returns and for the permanent improvement of the soil. This latter phase of farm practice is not given the thought and consideration it should receive by most farmers.

Concisely, the average results for five years' experiments with different quantities of fertilizers are as follows:

Pounds Fertilizer per Acre.	Average Yield Seed Cotton per Acre, Pounds.	Average Increase Over Unfertilized Plats, Pounds per Acre.	Average Value of Increase at 4½ Cents per Pound.
200	656.5	402.4	$ 16.00
400	912.9	706.7	27.59
600	1208.9	858.2	32.30
800	1083.5	932.2	33.84
1,000	1180.9	1053.1	36.86

TABLE VI—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON; TIME OF AP

RESULTS IN FIELD A IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
4[2]	Unfertilized=.....O=	.....	.....	.....	225.0	210.0
5[2]	38.5 pounds 13% blood applied at planting=.....½N=	5	.....	.....	690.0	950.0
	33.8 pounds 14.8% nitrate of soda applied about July 1st=.....½N=	5	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....		
	50 pounds 20% manure salt=.....K=	.....	.....	10		
6[2]	33.8 pounds 14.8% nitrate of soda applied at planting=.....½N=	5	.....	.....	650.0	840.0
	33.8 pounds 14.8% nitrate of soda applied about July 1st=.....½N=	5	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....		
	50 pounds 20% manure salt=.....K=	.....	.....	10		
7[2]	38.5 pounds 13% blood applied at planting=.....½N=	5	.....	.....	640.0	835.0
	38.5 pounds 13% blood applied about July 1st=.....½N=	5	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....		
	50 pounds 20% manure salt=.....K=	.....	.....	10		
8[2]	61.6 pounds 13% blood applied at planting=.....4-5N=	8	.....	.....	620.0	927.5
	13.5 pounds 14.8% nitrate of soda applied at planting=.....1-5N=	2	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....		
	50 pounds 20% manure salt=.....K=	.....	.....	10		
11[2]	Unfertilized=.....O=	.....	.....	.....	235.0	212.5

RESULTS IN FIELD

11[3]	38.5 pounds 13% blood applied at planting=.....½N=	5	.....	.....	.....	.....
	33.8 pounds 14.8% nitrate of soda applied about July 1st=.....½N=	5	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....		
	50 pounds 20% manure salt=.....K=	.....	.....	10		
12[3]	33.8 pounds 14.8% nitrate of soda applied at planting=.....½N=	5	.....	.....	.....	.....
	33.8 pounds 14.8% nitrate of soda applied about July 1st=.....½N=	5	.....	.....		
	200 pounds 14% acid phosphate=.....P=	.....	28	.....		
	50 pounds 20% manure salt=.....K=	.....	.....	10		

EFFECT OF DIFFERENT MATERIALS FURNISHING NITROGEN AND PLICATION.

1903, 1904, 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Annual Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
4[2]	.....	60.0	.....	.....	90.0	146.3	.....	$.....	$.....	$.....
5[2]	.....	515 0	.....	.....	770.0	731.3	585.0	26.33	3.90	22 43
6[2]	.....	482 0	.....	.....	640 0	653.0	506 7	22.80	3 59	19 21
7[2]	.....	540 0	.....	.....	647.0	665.5	519 2	23 36	4 21	19 15
8[2]	.....	490 0	.....	.....	685 0	680 6	546.8	24 61	4.14	20 47
11[2]	.....	22.5	.....	.....	65.0	133 8	.....	.....	.....	.....

B IN 1905 AND 1907.

11[3]	972.5	.....	850.0	.....	.....	861.3	738 0	33.21	3.90	29 31
12[3]	977.5	.....	915.0	.....	.....	946.3	839.1	37.76	3.59	34 17

TABLE VI—

RESULTS IN FIELD

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
13[3]	38.5 pounds 13% blood applied at planting=½N	5				
	38.5 pounds 13% blood applied about July 1st=½N	5				
	200 pounds 14% acid phosphate=P		28			
	50 pounds 20% manure salt=K			10		
•14[3]	Unfertilized=O					
15[3]	61.6 pounds 13% blood applied at planting=4-5N	8				
	13.5 pounds 14.8% nitrate of soda applied at planting=1-5N	2				
	200 pounds 14% acid phosphate=P		28			
	50 pounds 20% manure salt=K			10		

AVERAGE RESULTS FOR 6

4[2]-(5[3]+14[3])	Unfertilized=O					
5[3]-11[3]	38.5 pounds 13% blood applied at planting=½N	5				
	33.8 pounds 14.8% nitrate of soda applied about July 1st=½N	5				
	200 pounds 14% acid phosphate=P		28			
	50 pounds 20% manure salt=K			10		
4[2]-(5[3]+14[3])	Unfertilized=O					
6[2]-12[3]	33.8 pounds 14.8% nitrate of soda applied at planting=½N	5				
	33.8 pounds 14.8% nitrate of soda applied about July 1st=½N	5				
	200 pounds 14% acid phosphate=P		28			
	50 pounds 20% manure salt=K			10		
4[2]-(5[3]+14[3])	Unfertilized=O					
7[2]-13[3]	38.5 pounds 13% blood applied at planting=½N	5				
	38.5 pounds 13% blood applied about July 1st=½N	5				
	200 pounds 14% acid phosphate=P		28			
	50 pounds 20% manure salt=K			10		
11[2]-14[3]	Unfertilized=O					

Continued.

B IN 1905 AND 1907.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
13^3	960.0	.....	777.5	.....	.....	868.8	777.7	$ 35.00	$ 4.21	$ 30.79
14^3	100.0	.....	50.0	.....	.....	75.0	.....	.....	.....	.....
15^3	1002.5	.....	860.0	.....	.....	931.3	856.3	38.53	4.14	34.39
YEARS IN FIELDS A AND B.										
4^2-(5^3+ 14^3)	.....	.....	.....	.....	.....	138.6	.....	.....	.....	.....
5^3-11^3	.....	.....	.....	.....	.....	774.6	636.0	28.62	3.90	24.72
4^2-(5^3+ 14^3)	.....	.....	.....	.....	.....	133.3	.....	.....	.....	.....
6^2-12^3	.....	.....	.....	.....	.....	750.8	617.5	27.79	3.59	24.20
4^2-(5^3+ 14^3)	.....	.....	.....	.....	.....	127.9	.....	.....	.....	.....
7^2-13^3	.....	.....	.....	.....	.....	732.3	604.4	27.20	4.21	22.99
11^2-14^3	.....	.....	.....	.....	.....	114.2	.....	.....	.....	.....

TABLE VI—

AVERAGE RESULTS FOR 6

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre.	
					1903.	1904.
8^2-15^3	61.6 pounds 13% blood applied at planting=4-5N=	8				
	13.5 pounds 14.8% nitrate of soda applied at planting=1-5N=	2				
	200 pounds 14% acid phosphate=P=		28			
	50 pounds 20% manure salt=K=			10		

NOTE.—The check for plats 11^3, 12^3 and 13^3, field B, have been obtained from plats 5^3 and 14^3. It has been assumed that there is a uniform increase or decrease in the natural fer-

EFFECT OF DIFFERENT MATERIALS FURNISHING NITROGEN AND TIME OF APPLICATION.

The experiments, the results of which are presented in Table VI, were arranged to test the comparative value of dried blood and nitrate of soda as nitrogen-furnishing materials in growing cotton, as well as the best way of applying these.

Nitrate of soda is a material easily soluble in water and therefore quickly available for the use of plants. The questions usually raised in connection with its use are the possibility of its loss from the soil, especially sandy or open, porous soil, because of its easy solubility in water, and its giving out before a long-seasoned crop has made its growth, thus leaving it without a supply of nitrogen before the end of the growing season. Its use is most strongly advocated for short-season crops, as in early truck and vegetable growing and as a top dressing for grain and for corn and cotton after growth is well advanced, or for any crop when seen to be in need of a quickly-acting nitrogen-supplying material.

Dried blood, which is a fair representative of the animal and vegetable materials furnishing nitrogen, as cotton-seed meal, tankage, etc., is not soluble in water and acts more slowly and for a longer time. It must be changed by rotting or decomposing in the soil into nitrate before it can feed the crop, and is thus likely to be effective throughout a reasonable growing season.

It has become a practice in growing many crops to apply only a part of the nitrogen at the time of planting and a portion later, usually as nitrate of soda, so as to keep the crop growing as rapidly as possible. The tests in Table VI were planned with a view of throwing as much light as possible on these questions of nitrogen fertilization. In the experiments all of the phosphoric acid

Continued.

YEARS IN FIELDS A AND B.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
8^2-15^3	.....	.....	.....	.....	.....	764.2	650.0	$ 29.25	$ 4.14	$ 25.11

tility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

and potash were applied in the drill before planting. On plat 5^2 and 11^3 one-half the nitrogen was supplied as dried blood and was applied with the phosphoric acid and potash before planting, and one-half the nitrogen was supplied as nitrate of soda and applied about July first. In plats 6^2 and 12^3 all of the nitrogen was furnished by nitrate of soda, one-half being applied before planting, with the phosphoric acid and potash and the other half about July first. On plats 7^2 and 13^3 the nitrogen was supplied by dried blood, one-half being applied before planting, with the phosphoric acid and potash and the other half about July first. On plats 8 and 15 four-fifths of the nitrogen was furnished by dried blood and one-fifth by nitrate of soda and was all applied before planting, along with the phosphoric acid and potash.

While there were variations in the different years and on the two fields from the two nitrogen-supplying materials and methods of application, the average results for the six years show rather marked uniformity in increased yields and profits. The average results are so nearly the same that it can hardly be said that one material or method of application has given better results than others, though slightly the largest average profit was obtained from applying all of the nitrogen along with the phosphoric acid and potash before planting, having four-fifths of it supplied as dried blood and one-fifth as nitrate of soda. The additional expense of dividing the application of nitrogen and applying one-half before planting and one-half later is not justified by the experiments. It is to be borne in mind that the soil on which these tests were made is a clay loam with a good clay subsoil, and the danger of loss from leaching is very slight, if any. It is quite clear from the six years' work on this soil with an application of 400 pounds per acre that the most economical way of applying the fertilizer is to put it all in the drill before planting the crop. The results might be different on sandy loams or sandy soils.

TABLE VII—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON;

RESULTS IN FIELD

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
*S[2]	13.5 pounds 14.8% nitrate of soda 61.6 pounds 13% blood = N	10				
	200 pounds 14% acid phosphate = P		28			
	50 pounds 20% manure salt = K			10		
11[2]	Unfertilized = O					
†9[2]	77 pounds 13% blood = N	10				
	200 pounds 14% acid phosphate = P		28			
	50 pounds 20% manure salt = K			10		
18[2]	Unfertilized = O					
‡16[2]	77 pounds 13% blood = N	10				
	200 pounds 14% acid phosphate = P		28			
	50 pounds 20% manure salt = K			10		

RESULTS IN FIELD

(*5[2]+14[2])	Unfertilized = O					
*10[2]	77 pounds 13% blood = N	10				
	200 pounds 14% acid phosphate = P		28			
	50 pounds 20% manure salt = K			10		
5[4]	Unfertilized = O					
†8[4]	77 pounds 13% blood = N	10				
	200 pounds 14% acid phosphate = P		28			
	50 pounds 20% manure salt = K			10		
‡7[4]	77 pounds 13% blood = N	10				
	200 pounds 14% acid phosphate = P		28			
	50 pounds 20% manure salt = K			10		

EFFECT OF DIFFERENT METHODS AND TIME OF APPLICATION.

A IN 1906 AND 1909.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Annual Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
*8[2]	.....	490.0	.....	.....	685.0	587.5	543 7	$ 24 47	$ 4 21	$ 20 26
11[2]	.....	22.5	.....	.....	65.0	43.8	.....	.....	.....	.....
†9[2]	.....	412.5	.....	.....	642.5	527.5	483.7	21.77	4.21	17.56
18[2]	.....	80.0	.....	.....	65.0	72.5	.....	.....	.....	.....
‡16[2]	.....	330.0	.....	.....	617.5	473.8	401 3	18.06	4.21	13.85

B IN 1905 AND 1907.

(*5[2]+14[2])	365.5	.....	244.0	.....	.....	305.6	.....	.....	.....	.....
*10[2]	1025.0	.....	908.0	.....	.....	1002.5	696.9	31.36	4.21	27.15
5[4]	220.0	.....	185.0	.....	.....	202.5	.....	.....	.....	.....
†8[4]	1365.0	.....	660.0	.....	.....	1012.5	810.0	36.45	4.21	32.24
‡7[4]	795.0	.....	475.0	.....	.....	635.0	432.5	19.46	4.21	15.25

TABLE VII—

RESULTS IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield of Seed Cotton in Pounds per Acre. 1903.	1904.
8	Unfertilized=O=					
*6	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		
8^2	Unfertilized=O=					
‡6^2	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		

AVERAGE RESULTS FOR 4

11^2-(5^2+14^2)	Unfertilized=O=					
*8^2-10^2	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		
11^2-5^4	Unfertilized=O=					
†9^2-8^4	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		
18^2-5^4	Unfertilized=O=					
‡16^2-7^4	77 pounds 13% blood=N= / 200 pounds 14% acid phosphate=P= / 50 pounds 20% manure salt=K=	10	28	10		

*The fertilizer was applied in the drill before planting on this plat.

†Fertilizer on this plat applied one-half in drill before planting and one-half as side dressing about July 1st.

‡Fertilizer on this plat applied broadcast before planting.

Continued.

FIELD C IN 1908.

Number of Plat.	Yield of Seed Cotton in Pounds per Acre.					Average Yield of Seed Cotton in Pounds per Acre.	Average Increase per Acre Due to Fertilizer.	Value of Increase at 4.5 Cents per Pound.	Cost of Fertilizer per Acre.	Average Annual Value of Increase Over Cost of Fertilizer.
	1905.	1906.	1907.	1908.	1909.					
8				290 0		290.0		$	$	$
*6				1070.0		1070.0	780.0	35.10	4.21	30 89
8^2				260.0		260 0				
‡6^2				1005.0		1005.0	745.0	33.53	4.21	29 32

YEARS IN FIELDS A AND B.

11^2-(5^2-14^2)						174.4				
*8^2-10^2						795.0	620.6	27 93	4.21	23.72
11^2-5^4						123.2				
†9^2-8^4						770.0	646.8	29.11	4.21	24.90
18^2-5^4						137.5				
‡16^2-7^4						554.4	416.9	18.76	4.21	14.55

NOTE.—The check for plat 8, field A, has been obtained from plats 4 and 11, and that for plat 10^2, field B, from plats 5^2 and 14^2. It has been assumed that there is a uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

EFFECT OF DIFFERENT METHODS AND TIME OF APPLICATION OF FERTILIZER.

The results presented in Table VII were obtained from experiments planned to show the effect on yield of seed cotton from applying—

(*a*) All the fertilizer in the drill before planting;

(*b*) Dividing the fertilizer into two equal parts, applying one-half in the drill before planting and the other half as a side dressing about July first; and

(*c*) From applying all of the fertilizer broadcast before planting, the quantity of fertilizer and the materials entering into it being the same in all three cases.

Taking the results as a whole, the increased yields and profits show that it has made very little difference whether all of the fertilizer was applied in the drill before planting, or whether it was divided into two equal parts and one-half put in the drill before planting and the other half applied as a side dressing about July first, according to season. The average yield and profit from broadcast application of fertilizer was less than two-thirds that produced by the same quantity of fertilizer when applied in either of the two ways given above. The amount of fertilizer used in the above test was 400 pounds per acre, and it is quite clear that the best and most economical way of using this amount of fertilizer per acre is in the drill before planting the crop. Larger quantities might give as good or better results broadcast, or when applied at different times. Experiments are being made to obtain information on these points.

II. VARIETIES, CULTURE, AND FERTILIZATION OF COTTON ON PIEDMONT RED CLAY LOAM, RED CLAY AND VALLEY SOILS.

Seven years' fertilizer and variety experiments have been conducted on the red clay loam soil of the Iredell Test Farm. On basis of these results and other information which we have, the suggestions below are given for the culture and fertilization of cotton on the red clay loams, red clays, and valley soils of the Piedmont, and the varieties of cotton which are best suited to them.

Cotton is not a hard or exhaustive crop on the soil, when the soil and crop are handled with care and intelligence. A bale of cotton (900 pounds of seed and 500 pounds of lint) removes from the soil in round numbers:

30 pounds Nitrogen,
12 pounds Phosphoric Acid, and
13 pounds Potash;

worth at present prices of fertilizer ingredients $7.20. Only 48 cents worth of this is carried away in the lint. The seed can be sold for enough to return in commercial fertilizer considerably more plant food than the lint and seed took from the soil. The stalks, leaves, and bolls, which should never be burned or otherwise removed, and 95 per cent of which have come from the air, add vegetable matter or humus to the soil. If the land is liberally fertilized in the right way and protected from surface washing, it should continue to produce large and profitable crops of cotton from year to year, and with a good rotation and proper fertilization will increase in fertility and productiveness. None of our staple crops are as easy on the soil as cotton when handled in the way indicated above.

Preparation and Cultivation.—The land should be thoroughly and well prepared by breaking in the fall or early spring to a depth of 6 or 8 inches, and the soil may be gradually deepened beyond this to advantage. Before planting, cut up well with a disk harrow to get rid of clods and to make a good seedbed and run off rows 3½ to 4 feet apart and on very fertile land 4½ feet. As a rule, the fertilizer should be put in the drill before planting and the cotton planted on a level or just above the level, according to the season and drainage condition of the land. Weeders and light harrows may be run across the rows two or three times before and after the cotton is up and before cultivation with cultivators and hoeing begins. When the crop is well up and danger of frost is over, hoe and thin to a

stand of 15 to 20 inches in the drill, leaving as nearly as possible one stalk in a place, and giving greater distance in the row and between rows as the productiveness of the land increases. On thin land the rows should be closer together and the cotton closer in rows, as the stalks do not grow very large; but distance should be given both ways as the land increases in productiveness, from whatever cause brought about. Cultivate with good one or two-horse cultivators, which will not require more than two furrows at greatest to the row, every ten days to two weeks and as nearly as possible after rains to keep down grass and weeds and to conserve the supply of moisture. The cultivation should be comparatively deep early in the season, becoming shallow as the crop grows and the root system develops. As the season in the Piedmont is short for cotton, it seems desirable not to continue the cultivation late on strong lands, as this will stop growth earlier and hasten maturity. On land producing strong growth it has been found to pay to top the cotton about September first, thus forcing the energies of the plant into development of fruit already set.

Varieties.—In seven years sixty varieties of cotton have been tested on the Iredell Farm, a number of these running through the entire period. The earlier maturing varieties of the King type have given the largest returns, though now and then, with a long season, the large boll, late-maturing kinds have stood well. Cottons of this latter type have made large showy growth, but frost catches them too often to make them safe for that soil and section of the State. Among the varieties which have done well are—

King's,
Simpkins',
Sugar Loaf,
Williams',
Edgeworth,
Webb,
Hodge,
Shine's Extra Early,
Dozier's.

These are all small to medium boll, early-maturing varieties, a number of them being of the same origin. Cleveland's Big Boll and Cook's Improved, among the medium and large boll kinds have done well.

The results of variety tests have been published each year and are summarized in the FEBRUARY (1909) BULLETIN. These results can be had for study by any one specially interested in them.

Fertilization.—Analyses of these soils show that they are very low in phosphoric acid, high in potash, and have a fair supply of lime, the quantity of nitrogen depending on the amount of vegetable or organic matter in the soil. Experiments show that phosphoric acid is the most needed constituent for the production of cotton, it having produced about two-thirds of the increased yield and profit, and nitrogen and potash combined about one-third. It is not possible, with present results, to say just what is the best proportion of these three constituents for most profitable returns, but it is certain that the fertilizer should carry a very high percentage of phosphoric acid and comparatively low percentages of nitrogen and potash. The indications are that a mixture containing 10 or more per cent phosphoric acid and 2 per cent each of nitrogen and potash will give close to if not the best returns. This mixture should be used for best results at the rate of at least 400 pounds per acre, and as much more as one can afford up to 1,000 pounds.

The nitrogen may be all derived from blood, tankage, cotton-seed meal, or similar products, or in part from one or all of these, and in part (up to one-half) from nitrate of soda or sulphate of ammonia.

Kainit, manure salt, sulphate or muriate of potash may furnish the potash, and acid phosphate the phosphoric acid. Four hundred pounds of the above mixture would contain 40 pounds phosphoric acid, and 8 pounds each of nitrogen and potash, and 1,000 pounds would contain 100 pounds phosphoric acid and 20 pounds each of nitrogen and potash. The required amounts of phosphoric acid in 400 and 1,000 pounds respectively of this mixture would be supplied by 286 and 715 pounds of 14 per cent acid phosphate; the nitrogen by 61½ and 154 pounds of 13 per cent dried blood, and the potash by 40 pounds and 100 pounds of 20 per cent manure salt. Other materials or other grades of these same materials may be used, and it will not be difficult, knowing just what they contain, to use such quantities of them as will be necessary to furnish the required amount of plant food, having in mind that it is the specific number of pounds of phosphoric acid, nitrogen, and potash that is desired, rather than a given weight of mixed fertilizer.

It is not more, but perhaps less difficult to calculate the number of pounds of nitrogen, phosphoric acid, and potash to be applied per acre to any given crop from materials which are to be had than to estimate the exact number of pounds of the materials to make a formula of a certain composition: as for example, in an 8-2-2 goods. The question of filler does not have to be considered in doing this, as is necessary in making a fertilizer formula in the usual way. When it is desired, for instance, to apply the equivalent of 400 pounds per acre of a fertilizer mixture containing 10 per cent of available phosphoric acid, and 2 per cent each of nitrogen and potash, or 40

pounds of phosphoric acid and 8 pounds each of nitrogen and potash, it is only necessary to divide the number of pounds of plant food desired per acre (40, 8, and 8) by the percentage composition of the materials to be used, as follows:

Number of Pounds of Plant Food per Acre Wanted.	÷	Percentage Composition of the Materials to be Used.	=	Number of Pounds of Fertilizer Materials per Acre to Apply.
Phosphoric Acid ....40 Lbs.	÷	14 Per Cent Acid Phosphate.	=	286 Pounds.
Nitrogen ..... 8 Lbs.	÷	13 Per Cent Dried Blood	=	61.5 Pounds.
Potash ..... 8 Lbs.	÷	20 Per Cent Manure Salt	=	40. Pounds.

The best and most economical way to apply this fertilizer is in the drill before planting, though there is no objection to dividing the application into two parts, putting one-half in the drill before planting and applying the other half as a side dressing around July first, according to season and growth of crop. It is certain that quantities of 400 pounds and less of fertilizer should not be applied broadcast.

TEST FARM BULLETINS.

(Being Bulletins giving results of Experiments on the Test Farms.)

NOVEMBER,	1900.	Fertilizer, Culture, and Variety Tests of Cotton, Corn, Irish and Sweet Potatoes, Grains and Grasses, on Edgecombe and Red Springs Farms.
JANUARY,	1902.	Fertilizer, Culture, and Variety Tests of Cotton and Corn; Experiments on Black or Pocosin Soil; Fertilizers for Corn and Cotton; Composts and Composting.
FEBRUARY,	1903.	Variety and Distance Tests of Corn and Cotton on Edgecombe and Red Springs Farms; Fertilizers for Corn, Cotton, and Tobacco.
SEPTEMBER,	1903.	Improvement of Corn by Seed Selection.
FEBRUARY,	1904.	Variety and Distance Tests of Corn and Cotton on Edgecombe, Red Springs, and Iredell Farms; Fertilizers for Corn, Cotton and Tobacco.
JULY,	1904.	Hairy Vetch and Bur Clover.
FEBRUARY,	1905.	Variety and Distance Tests of Corn and Cotton on Edgecombe, Iredell, and Transylvania Farms; Fertilizers for Corn, Cotton, and Tobacco.
FEBRUARY,	1906.	Variety and Distance Tests of Corn and Cotton; Fertilizers for Corn, Cotton, and Tobacco.
JUNE,	1906.	Alfalfa Growing.
AUGUST,	1906.	Selecting Seed Corn for Larger Yields.
SEPTEMBER,	1906.	The Cotton Plant.
JANUARY,	1907.	Fertilizer Experiments on Corn and Cotton with Nitrate of Soda, Peruvian Guano, Phosphate Rock, and Basic Slag.
FEBRUARY,	1907.	Variety and Distance Tests of Corn and Cotton on Edgecombe, Iredell, and Transylvania Farms.
SEPTEMBER,	1907.	Lettuce Growing in North Carolina.
FEBRUARY,	1908.	Variety and Distance Tests of Corn and Cotton on Edgecombe, Iredell, and Buncombe Farms.
FEBRUARY,	1909.	Variety and Distance Tests of Corn and Cotton; Fertilizers for Corn, Cotton, and Tobacco.
MARCH,	1909.	Peanut Culture.
AUGUST,	1909.	Varieties, Culture, and Fertilization of Small Grain.
FEBRUARY,	1910.	Variety Tests of Corn and Cotton.
JUNE,	1910.	The Culture of the Cowpea; Variety and Fertilizer Tests on Piedmont Red Clay Loam Soil of the Iredell Farm.

LEAF TOBACCO SALES FOR JULY, 1910.

Pounds sold for producers, first hand	353,878
Pounds sold for dealers	31,185
Pounds resold for warehouses	55,815
Total	440,878

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE,

RALEIGH

Volume 31. No. 8 SEPTEMBER, 1910 Whole No. 140

I. FERTILIZER EXPERIMENTS WITH CORN ON PIEDMONT RED CLAY LOAM SOIL

AND

II. VARIETIES, CULTURE AND FERTILIZATION OF CORN ON PIEDMONT RED CLAY LOAM, RED CLAY, AND VALLEY SOILS.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST OFFICE AS SECOND-CLASS MAIL MATTER

STATE BOARD OF AGRICULTURE

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Sifford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.
F. S. Puckett	Assistant to Director Test Farms.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

* Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, September 10th, 1910.

SIR:—I submit in manuscript a report covering experiments with corn on the Iredell Test Farm for the years 1903-'09, inclusive, together with a discussion of the results. B. W. Kilgore and C. B. Williams are responsible for the plans and conduct of the work in 1903-'07; B. W. Kilgore and G. M. MacNider, 1907-'09. F. T. Meacham had charge of the culture and handling of the crop and E. L. Worthen, G. B. Walker, and W. C. Etheridge did the main work in putting the results in tabular form. B. W. Kilgore is responsible for the form of the report, the conclusions, and the writing of it.

The JUNE and AUGUST BULLETINS contained like reports of experiments with cow peas and cotton, respectively, on the Iredell Test Farm. Similar reports are to follow covering the work on the Edgecombe Test Farm with corn and cotton.

I recommend the publication of this report as the SEPTEMBER BULLETIN. Respectfully,

B. W. KILGORE,
Director of Test Farms.

To HON. W. A. GRAHAM,
Commissioner of Agriculture.

I. FERTILIZER EXPERIMENTS WITH CORN ON PIEDMONT RED CLAY LOAM SOIL

AND

II. VARIETIES, CULTURE, AND FERTILIZATION OF CORN ON PIEDMONT RED CLAY LOAM, RED CLAY, AND VALLEY SOILS.

BEING A REPORT OF WORK WITH CORN ON THE IREDELL TEST FARM IN 1903-'09 INCLUSIVE.

BY B. W. KILGORE, C B. WILLIAMS, G. M. MACNIDER, AND F. T. MEACHAM.

GENERAL SUMMARY OF RESULTS OF FERTILIZER TESTS.

1. The right fertilization of corn has paid well on the red (cecil) clay loam soils of the State. What this fertilization should be on this and similar soils is shown by the results of our experiments as given on the following pages.

2. For the production of corn on this land nitrogen alone was used at a loss; potash alone was used at a loss; and from nitrogen and potash combined with each other the increased yields over unfertilized plats were very small and were not sufficient to cover the cost of fertilizer, the fertilizer application from these two constituents having cost $1.26 per acre more annually than the value of the increased yield of corn. This shows that neither nitrogen alone, potash alone, nor nitrogen and potash combined with each other should be used on this land in growing corn.

3. Phosphoric acid alone produced increased yields at good profits in all cases. Nitrogen combined with phosphoric acid added decidedly to the increased yields and profits, as did potash also when combined with phosphoric acid, though larger yields were obtained from nitrogen and phosphoric acid than from potash and phosphoric acid, indicating that nitrogen is more important than potash for corn production on this soil. Nitrogen, phosphoric acid and potash combined in a complete fertilizer gave slightly larger yields, but no larger profits than nitrogen and phosphoric acid and potash and phosphoric acid.

The experiments, as a whole, show that phosphoric acid is the predominant fertilizer constituent for increasing yields and adding to profits in growing corn on this soil and that nitrogen is the next most important constituent.

4. The average results show that lime, whether used alone or in combination with nitrogen, phosphoric acid and potash, was at a loss. On the two plats which had been continuously in corn and cotton the losses were large from the application of lime, whether applied alone or in connection with the other three fertilizer constituents. These results cover seven years. On land which had been in peas after grain four previous years there were good returns in yields and profits from the use of lime alone and in combination with nitrogen, phosphoric acid and potash. The results on the pea land were for only one year.

On the whole, the indications are that this soil does not need lime for corn when cotton, corn, small grain and similar crops have been grown continuously on it, but that it is benefited by lime when peas, clover and similar crops have been grown, adding vegetable matter to the soil.

5. The amount of nitrogen in the normal fertilizer (300 pounds per acre) applied in the corn experiments was 3 per cent or 9 pounds to the acre. This amount was varied so as to give 4½, 9, 18, and 27 pounds of nitrogen per acre. The results emphasize the importance of nitrogen for the production of corn on this soil when applied in connection with a good amount of phosphoric acid and some potash, the larger the amount of nitrogen the greater was the yield, though the largest profit was obtained from twice the normal quantity of nitrogen, or 18 pounds per acre. Eighteen pounds of nitrogen would be supplied by 138.4 pounds of 13 per cent dried blood. The average yield of corn during seven years on the plats receiving twice the normal quantity of nitrogen and the normal quantities of phosphoric acid and potash (N_2 P K) was 39.8 bushels per acre and the average increase over unfertilized plats 24.2 bushels. This fertilizer application cost $5.44 per acre, making the cost of fertilizer per bushel of increase in corn 22.4 cents.

6. The amount of potash in the normal fertilizer (300 pounds per acre) used was 1½ per cent, or 4½ pounds per acre. This amount was varied so as to apply 2.2, 4½, 9 and 13½ pounds per acre respectively. The results are quite uniform in showing that the larger quantities were not as profitable as the normal amounts, 1½ per cent in the fertilizer mixture, or 4½ pounds per acre; 2.2 pounds, or the smallest quantity of potash used, did not give as good results as 4½ pounds, indicating that 4½ pounds of potash per acre, or 1½ per cent in the fertilizer mixture, is about the right amount for corn production on this soil; 4½ pounds of potash would be supplied by 22½ pounds of 20 per cent manure salt.

7. The amount of phosphoric acid in the normal fertilizer (300 pounds per acre) used was 7 per cent or 21 pounds of phosphoric acid per acre. This quantity was varied so as to apply 10½, 21, 42,

and 63 pounds respectively of phosphoric acid per acre. These amounts of phosphoric acid would be supplied by 75, 150, 300, and 450 pounds respectively of 14 per cent acid phosphate. The results show the largest yields, increases and profits to have come from the application of 150 pounds of 14 per cent acid phosphate, or 21 pounds of phosphoric acid per acre. Larger quantities of phosphoric acid gave profitable yields, but the profits were not as large as with the above amount when the quantities of nitrogen and potash were not changed.

8. Varying the amounts of the normal fertilizer application from 150 to 900 pounds per acre gave increased yields and profits for all the applications, the most profitable returns resulting from 450 pounds of fertilizer per acre. After paying for the fertilizer itself the following profits were obtained from different quantities of fertilizer:

150 pounds of fertilizer per acre gave a profit for corn and stover of $6.74;

300 pounds of fertilizer per acre gave a profit for corn and stover of $14.29;

450 pounds of fertilizer per acre gave a profit for corn and stover of $17.82;

600 pounds of fertilizer per acre gave a profit for corn and stover of $12.83.

9. In comparisons of dried blood and nitrate of soda as sources of nitrogen, the total yields and increased yields over unfertilized plats were quite uniform and do not show any decided advantage of either nitrogen furnishing material over the other, or any one of the methods of application over the others, though the average results gave a slightly larger profit with nitrate of soda as the source of nitrogen, when two applications were made, one-half at time of planting, and the other half about July first. Taking into consideration the additional cost of making the second application of nitrogen the best returns for corn was from the application of all the fertilizer in the drill before planting.

10. When 300 pounds of fertilizer were applied each in the drill, broadcast before planting, and divided into two equal parts, one-half being applied in the drill before planting and the other half as a side dressing about July 1, the broadcast application yielded 22 per cent less in production and profit than did the other two methods of application; the other two methods of application were practically equal in increased yields and profits.

11. Taking the conclusions under 9 and 10 together, it is seen that where 300 pounds of fertilizer is used to the acre on this character

of soil, the best and most economical method of application is in the drill before planting.

12. Our soil analyses of the various soils of the State indicate that these results will apply to the red (cecil) clay loams, red (cecil) clays and valley soils of the Piedmont, and in like manner the soil analyses and experiments on the mountain soils indicate that they will apply to the mountain sections of the State also.

13. For the production of corn on this soil, taking the results here reported as a whole, it is recommended that 300 to 500 pounds of fertilizer be used per acre. The fertilizer can be most profitably applied in the drill before planting, though there is no objection to dividing the application into two parts, putting out one-half in the drill before planting and the other half as a side dressing around July 1, according to growth and season. The fertilizer mixture should contain about 10 per cent available phosphoric acid, 1½ per cent of potash, and 5 per cent nitrogen; 6 per cent nitrogen is not too much on lands which have been grown continuously or practically so in cotton, corn, and small grain. Five per cent nitrogen is equal to 6.08 ammonia. The nitrogen may be all derived from dried blood, tankage, cotton-seed meal or similar products, or in part from one or all of these and in part from nitrate of soda. Nitrate of soda may be used as the entire source of nitrogen when divided into two parts. Kainit, manure salt, sulphate or muriate of potash may furnish the potash and acid phosphate the phosphoric acid.

Three hundred pounds of the above mixture would contain 30 pounds of available phosphoric acid, 4½ pounds of potash, and 15 pounds of nitrogen; and 500 pounds would contain 50 pounds available phosphoric acid, 7½ pounds potash, and 25 pounds of nitrogen. The required amounts of phosphoric acid in 300 and 500 pounds respectively of this mixture would be supplied by 214.3 pounds and 357.1 pounds of 14 per cent acid phosphate, the nitrogen by 115.4 pounds and 192.3 pounds of 13 per cent dried blood, and the potash by 22.5 pounds and 37.5 pounds of manure salt. Other materials or other grades of these same materials may be used and it will not be difficult, knowing just what they contain, to use such quantities of them as may be necessary to furnish the desired quantities of plant food, having in mind that it is the specific number of pounds of phosphoric acid, nitrogen and potash that is desired rather than a given weight of mixed fertilizer.

It is not more, but perhaps less difficult to calculate the number of pounds of nitrogen, phosphoric acid and potash to be applied per acre to any given crop from materials which are to be had than to estimate the exact number of pounds of the materials to make a formula of a certain composition, as for example, in an 8-2-2 goods. The question of filler does not have to be considered in doing this, as

is necessary in making a fertilizer formula in the usual way. When it is desired, for instance, to apply the equivalent of 500 pounds per acre of a fertilizer mixture containing 10 per cent available phosphoric acid, 1½ per cent potash and 5 per cent nitrogen, or 50 pounds phosphoric acid, 7½ pounds potash, and 25 pounds of nitrogen, it is only necessary to divide the number of pounds of plant food desired per acre (50, 7½ and 25) by the percentage composition of the materials to be used as follows:

Number of Pounds of Plant Food per Acre Wanted.		Percentage Composition of the Materials to be Used.		Number of Pounds of Fertilizer Materials per Acre to Apply.
Phosphoric Acid	50 Lbs.	14 Per Cent Acid Phosphate	=	357.1 Pounds.
Nitrogen	25 Lbs.	13 Per Cent Dried Blood	=	192.3 Pounds.
Potash	7.5 Lbs.	20 Per Cent Manure Salt	=	37.5 Pounds.

I. FERTILIZER EXPERIMENTS WITH CORN ON PIEDMONT RED CLAY LOAM SOILS.

This is the third of a series of BULLETINS giving the results of experiments to determine the fertilizer or plant food needs of different crops on the different type soils of the State. The two previous reports issued as the JUNE and AUGUST (1910) BULLETINS, gave

1. Results of Fertilizer and Variety Experiments with Cow Peas on Piedmont Red Clay Loam Soil (June).

2. Results of Fertilizer Experiments with Cotton on Piedmont Red Clay Loam Soil; and Varieties, Culture and Fertilization of Cotton on Piedmont Red Clay Loam, Red Clay and Valley Soils (August).

More attention is now being paid to corn production than ever before in the history of the State and fertilizers are used more generally on the crop than in former years. Some ten years ago systematic experiments were begun to determine the fertilizer or plant food requirements for the most economical production of cotton on our different cotton soils.

On the following pages are recorded the results of seven years' fertilizer and variety tests of corn on the Iredell Test Farm of this Department, extending through the years 1903-1909, both inclusive. The work is being continued to collect further data, when grown as it has been in the work here recorded, as well as in rotations with other staple crops and soil improving crops.

LOCATION OF FARM AND CHARACTER OF SOIL.

The Iredell Test Farm is located near Statesville, in Iredell County, well up in the Piedmont (foothill) section of the State, the elevation being 950 feet above sea level. The main type of soil on the farm is red (cecil) clay loam, the subsoil being a moderately heavy clay, but the surface soil has sufficient sand in it to make it a clay loam rather than a clay, though when freshly plowed it would to a casual observer be looked upon as red clay. The main types of soil in the Piedmont are cecil sandy loam (gray land), red (cecil) clay loam, and red (cecil) clay, the latter two being the predominating types. The clay and clay loam types are rich in potash, very poor in phosphoric acid, the amount of nitrogen depending on the organic matter in the soil. Analyses of samples of soil from the unfertilized plats, on which these experiments were conducted, show that the soil contains about the following number of pounds of plant

food per acre (to a depth of ten inches, estimating the weight of this ten-inch acre soil to be three million pounds) of:

Nitrogen (N)	2,010 pounds
Phosphoric Acid (P_2O_5)	2,280 pounds
Potash (K_2O)	12,540 pounds
Lime (CaO)	12,840 pounds

THE PLATS.

The plats on which these experiments were conducted were embraced in Fields A, B and C. Fields A and B had been long in cultivation and were badly run down when work was started in 1903. The plats in Field A were laid off in two series parallel to each other, there being twenty plats to the series, with a driveway or turn row between plats. The plats are one-tenth acre in size, or 217.8 feet by 20 feet, with space between plats sufficient for two rows of corn or other crops, the row on either side of each plat being fertilized like the plat which it adjoins.

The plats in Field B were laid out in a similar way and are of the same size.

The plats in Field C were part of an old field, covered with broom sedge, small briars, and small pines in 1903. The pines were grubbed out and the other growth turned under with a two-horse plow in the spring of 1903 and cultivated in corn that year, with a fertilizer application of 300 pounds per acre, of the normal corn mixture. In the fall of 1903 crimson clover was sown but no stand was obtained. The land was prepared in the spring of 1904 and laid off in plats of one-twentieth acre each, the size being 108.9 feet by 20 feet, with space between plats for two extra rows, the rows nearest the plats being fertilized in each case like the plats they adjoin. There is a four-foot space at the ends of the plats. There are two series of sixteen plats each in this field, with driveway or turn row between.

In the case of all plats on this farm there is a four-foot extra space at the ends of all plats.

Field A.—These plats were used for fertilizer experiments with cotton in 1903-4-6-9; for fertilizer experiments with corn in 1905-7; for general crop of oats without fertilizer in the fall and spring of 1908; and for fertilizer experiments with peas in the summer of 1908. In case of each of the three crops the same plan or system of fertilization was followed. By this is meant that plat one in all cases received only nitrogen; plat two, phosphoric acid; plat three, potash, and so on, though the quantities actually applied varied with the three crops. The fertilization of the cotton plats was based on a normal application of 400 pounds per acre of a mixture containing 7 per cent available phosphoric acid and 2 per cent each of nitrogen

and potash. The fertilization for corn was on basis of 300 pounds per acre of a mixture containing 7 per cent available phosphoric acid, 3 per cent nitrogen, and 1½ per cent potash. For peas the fertilization was based on a normal application of 300 pounds per acre of a mixture containing 8 per cent available phosphoric acid, 1 per cent nitrogen and 4 per cent potash.

Field B.—These plats were used for fertilizer experiments with corn in 1903-4-6-8; for fertilizer experiments with cotton in 1905 and 1907; for a general crop of oats without fertilizer in the fall and spring of 1909, and for fertilizer experiments with peas in the summer of 1909.

Field C.—These plats were used for fertilizer experiments with peas in 1904-5-6-7; a grain crop without fertilization preceding the pea crop in each year except 1904; for fertilizer experiments with cotton in 1908; and for fertilizer experiments with corn in 1909.

PREPARATION AND CULTIVATION.

The land in all cases was well prepared by breaking with a two-horse turning plow in the winter, usually January and February, to a depth of 8 to 10 inches, and allowed to remain this way until just before planting, when it was cut up thoroughly with a disk harrow. The rows were run off 4 feet apart, and the fertilizer distributed in the drill.

The corn was well cultivated with weeders, harrows, Planet Jr., and two-horse cultivators, requiring not exceeding two furrows to row, making the cultivation deep at beginning and shallow toward the close of the season, when root development of the plants was well extended into the soil. The cultivation was repeated each ten days or two weeks during the season, the crop being laid by when well in silk. The corn was thinned as nearly as possible to one stalk in the hill every 2½ feet.

FERTILIZATION AND FERTILIZER MATERIALS USED.

As already stated, the fertilizer was applied in the drill just before planting the corn, the exact quantity of material for each row being weighed out separately so that each row would get its proper amount of the several fertilizer constituents. Acid phosphate was used as the source of phosphoric acid; dried blood as the source of nitrogen, except where there was a comparison of different nitrogen furnishing materials, or where nitrate of soda was used as a part of the nitrogen; manure salt as the source of potash, and rock or building lime for lime. The fertilizer materials were analyzed each year and applications made on basis of actual analyses, so as to give the exact quantities of nitrogen, phosphoric acid, and potash required for each plat. For the sake of simplicity and convenience in presenting the results

of a number of years' experiments, the fertilizer applications are expressed in terms of acid phosphate containing 14 per cent available phosphoric acid, dried blood containing 13 per cent nitrogen, nitrate of soda containing 14.8 per cent nitrogen, and manure salt containing 20 per cent potash, which figures represent the average composition of these materials. The fertilizer applications in the fertilizer experiments are on basis of 300 pounds per acre for the normal plat (N P K) of a mixture containing 7 per cent available phosphoric acid, 3 per cent of nitrogen, and 1½ per cent of potash. Lime is applied at the rate of 500 pounds rock or building lime, or 1,000 pounds slaked lime. The fertilizer applications in the tables, in addition to being represented in terms of acid phosphate, dried blood, nitrate of soda and manure salt, are also expressed in terms of the symbols, N, P, K, and L, which have the following significance:

N equals nitrogen at the rate of 9 pounds per acre, or 69.2 pounds of 13 per cent dried blood;
P equals phosphoric acid at the rate of 21 pounds per acre, or 150 pounds of 14 per cent acid phosphate;
K equals potash at the rate of 4.5 pounds per acre, or 22.5 pounds 20 per cent manure salt;
L equals lime at the rate of 500 pounds rock, or 1,000 pounds slaked lime per acre.

There are columns in the tables showing the exact weights in pounds of phosphoric acid, nitrogen and potash applied to each plat (expressed on acre basis), which will enable any one to use these same amounts of fertilizer constituents in other materials if desired.

The following average prices which fairly represent the cost of the several materials to the farmer for the period under experimentation have been assumed for the materials used:

14 per cent Acid Phosphate	$14.00 per ton
13 per cent Dried Blood	60.00 per ton
14.8 per cent Nitrate Soda (18 per cent ammonia)	50.00 per ton
20 per cent Manure Salt	20.00 per ton
Rock Lime	10.00 per ton

The arrangements of the plats and the scheme of fertilizer application is shown by the following:

Normal fertilizer application, 300 pounds per acre of mixture containing—

Phosphoric Acid	7 per cent.
Nitrogen	3 per cent.
Potash	1½ per cent.

In this normal application—

N equals 9 pounds nitrogen, equals 69.2 pounds 13 per cent dried blood;

P equals 21 pounds phosphoric acid, equals 150 pounds 14 per cent acid phosphate;

K equals 4.5 pounds potash, equals 22.5 pounds 20 per cent manure salt.

Size of Plats, one-tenth acre (217.8x20 feet).

Second Series.	*Application.*
3^2	N
4^2	P
5^2	O
6^2	K
7^2	N P
8^2	N K
9^2	P K
10^2	N P K
11^2	$N\frac{1}{2}$ P K
12^2	N_2 P K
13^2	N_3 P K
14^2	O
15^2	N $P\frac{1}{2}$ K

Third Series.	*Application.*
1^3	N P_2 K
2^3	N P_3 K
3^3	N P $K\frac{1}{2}$
4^3	N P K_2
5^3	O
6^3	N P K_3
7^3	$\frac{1}{2}$ (N P K)
8^3	$1\frac{1}{2}$ (N P K)
9^3	2 (N P K)
10^3	3 (N P K)
11^3	N P K — Two applications nitrogen, one-half as blood at planting, one-half as nitrate soda later.
12^3	N P K — Two applications nitrogen, one half as nitrate of soda at planting, one-half as nitrate of soda later.
13^3	N P K — Two applications nitrogen, one-half as blood at planting, one-half as blood later.
14^3	O
15^3	N P K — Two sources of nitrogen, one-fifth as nitrate of soda at planting, four-fifths as blood at planting.

Fourth Series.	*Application.*	
4^4	Lime	1,000 pounds slaked lime per acre broadcast every fourth year.
5^4	O	
6^4	N P K L	
7^4	N P K	Fertilizer applied broadcast.
8^4	N P K	Two applications of fertilizer, one-half at planting, one-half later.

WEATHER CONDITIONS DURING 1903-'09, INCLUSIVE.

Besides soil, seed, fertilization and cultivation, and time of planting, weather conditions, mainly the rainfall, influence the crop yield. In the tables presented herewith will be found the monthly and annual rainfall during the years covered by the experiments, the mean monthly and annual rainfall, since 1868, and the same data for the months of May to September, inclusive. During the growing months the rainfall in 1903 was below the normal; good conditions prevailed in 1904; 1905 and 1906 had more than the normal amount of rainfall and there was an early frost in 1906. The rainfall throughout 1907 and in the growing season was low, and 1908 and 1909 were noted for heavy rainfalls.

RAINFALL IN INCHES AT STATESVILLE.

	1903.	1904.	1905.	1906.	1907.	1908.	1909.	Means of Observations Since 1868.
January	6.43	2.07	2.88	7.23	.05	4.20	.....	3.98
February	9.90	3.87	5.70	1.75	2.16	3.90	.....	4.57
March	8.66	2.46	1.50	6.00	2.75	3.80	.....	5.15
April	7.37	1.55	2.28	1.49	3.85	3.10	.....	3.67
May	.63	2.07	6.78	2.02	3.02	2.04	5.58	3.96
June	4.52	5.74	1.28	6.45	4.74	1.55	10.67	4.36
July	3.55	4.01	8.95	8.68	2.02	9.33	5.96	4.81
August	3.04	6.60	8.75	6.37	3.26	13.27	4.95	5.82
September	5.05	1.31	1.30	3.61	6.05	3.75	1.58	4.19
October	1.08	.12	2.06	4.11	1.60	8.15	2.92	3.23
November	1.72	3.71	.35	.80	4.00	1.90	1.11	2.98
December	1.69	3.64	8.09	2.80	6.22	4.60	2.52	4.37
Annual	53.64	37.15	49.91	51.31	39.66	59.59	.....	51.09
Monthly average for May to Sept., inclusive	4.04	4.41	5.07	6.28	4.02	6.97	5.75	4.79

THE RESULTS.

In studying the yields of the several fields it is well to bear in mind that Field A was used continuously during the seven years for cotton and corn, except in 1908, when oats without fertilizer were grown in the spring and followed by a crop of fertilizer experiment peas in the summer. Field B was used continuously for corn and cotton, but had oats and peas in 1909. Field C grew oats and peas, oats without fertilizer and peas in the regular fertilizer experiments in 1904-5-6-7; cotton in 1908, and corn in 1909.

In the future, as during the past three years, the crops will be grown according to the following rotation:

TABLE I. RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON IRE AND LIME ALONE AND IN COM

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre.		
					1903	1904	1906
3[2]	69.2 pounds 13% blood=N=	9			32.4	24.1	18.8
4[2]	150 pounds 14% acid phosphate=P=		21		35.4	27.4	24.1
5[2]	Unfertilized=O=				20.2	25.7	*22.6
6[2]	22.5 pounds 20% manure salt=K=			4.5	34.5	22.5	17.6
7[2]	69.2 pounds 13% blood=N= 150 pounds 14% acid phosphate=P=	9	21		41.2	38.3	40.4
8[2]	69.2 pounds 13% blood=N= 22.5 pounds 20% manure salt=K=	9		4.5	30.9	21.2	14.9
9[2]	150 pounds 14% acid phosphate=P= 22.5 pounds 20% manure salt=K=		21	4.5	31.9	35.9	36.9
10[2]	69.2 pounds 13% blood=N= 150 pounds 14% acid phosphate=P= 22.5 pounds 20% manure salt=K=	9	21	4.5	34.2	37.1	43.2
4[4]	500 pounds unslaked lime every fourth year=L=				21.7	18.2	9.5

First year ..... Cotton;
Second year ..... Corn;
Third year ..... Small grain and peas.

Each crop has been and will be fertilized according to the scheme outlined in the fertilizer experiments for cotton, corn, small grain and peas.

The experiments were planned to cover the culture and fertilization of corn as a whole, but the results of the several subdivisions or phases of the subject are grouped in short tables to facilitate examination and the drawing of conclusions, after which they will be considered as a whole and general conclusions drawn for the fertilization of the crop on this type of soil.

DELL TEST FARM; EFFECTS OF NITROGEN, PHOSPHORIC ACID, POTASH, BINATION WITH EACH OTHER.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8.00 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
3[2]	8.6	21.0	1690	1885	1842	1120	1634	1.1	—173	$ .08	$ 2.08	$ —2.00	$ —1.31
4[2]	18.7	26.4	1840	2200	2357	1780	2044	6.5	237	5.50	1.05	4.45	3.50
5[2]	11.1	19.9	1875	2030	*2215	1110	1807	-----	-----	-----	-----	-----	-----
6[2]	9.3	21.0	1850	1895	1877	1320	1736	1.76	—10	1.19	.23	.96	1.00
7[2]	24.5	36.7	2145	2890	2830	2010	2469	17.54	784	15.42	3.13	12.29	9.15
8[2]	8.2	18.6	2045	1785	1825	1400	1764	.92	140	1.20	2.31	—1.11	—1.67
9[2]	25.0	32.4	1828	2850	2935	1920	2383	15.2	821	13.92	1.28	12.64	9.36
10[2]	22.8	34.3	1670	2965	3180	1835	2413	17.8	911	16.10	3.36	12.74	9.10
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
4[4]	4.4	13.5	1820	880	1410	780	1223	1.1		.80	.63	.17	.14

TABLE I--

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
5[4]	Unfertilized=.....O=				20.1	15.8	10.5
6[4]	69.2 pounds 13% blood=.....N=	9			30.8	27.2	29.1
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
	500 pounds unslaked lime every fourth year=.....L=						

RESULTS IN FIELD

					1905
1	69.2 pounds 13% blood=.....N=	9			24.8
2	150 pounds 14% acid phosphate=.....P=		21		31.6
3	22.5 pounds 20% manure salt=.....K=			4.5	24.2
4	Unfertilized=.....O=				25.2
5	69.2 pounds 13% blood=.....N=	9			51.3
	150 pounds 14% acid phosphate=.....P=		21		
6	69.2 pounds 13% blood=.....N=	9			29.1
	2.5 pounds 20% manure salt=.....K=			4.5	
7	150 pounds 14% acid phosphate=.....P=		21		46.7
	22.5 pounds 20% manure salt=.....K=			4.5	
8	69.2 pounds 13% blood=.....N=	9			47.8
	150 pounds 14% acid phosphate=.....P=		21		
	22.5 pounds 20% manure salt=.....K=			4.5	
14[2]	500 pounds unslaked lime every fourth year=.....L=				22.5
15[2]	69.2 pounds 13% blood=.....N=	9			44.5
	150 pounds 14% acid phosphate=.....P=		21		
	22.5 pounds 20% manure salt=.....K=			4.5	
	500 pounds unslaked lime every fourth year=.....L=				
18[2]	Unfertilized=.....O=				42.3

Continued.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer	Value of Increase with Corn at $.70 per Bushel and Stover at $8.00 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fert.
	1908	Ave.	1903	1904	1906	1908	Ave.						
5[1]	3.1	12.4	1635	1120	1240	870	1216						
6[1]	22.2	29.8	2000	1980	2290	1180	1863	14.9	647	$13.02	$ 3.99	$ 9.03	$ 3.29

A, 1905 AND 1907.

	1907				1905	1907							
1	5.3	15.1	.....	.....	2115	1190	1653	—3.3	—147	—2.90	2.08	—4.98	—4.39
2	15.1	23.4	.....	.....	2325	1325	1825	5.0	25	3.60	1.05	2.55	2.45
3	6.8	15.5	.....	.....	1800	1235	1518	—2.9	—282	—3.16	.23	—3.39	—2.26
4	11.6	18.4	.....	.....	2085	1515	1800						
5	28.9	40.1	.....	.....	2920	3045	2983	22.4	1237	20.63	3.13	17.48	12.55
6	11.3	20.2	.....	.....	1900	1635	1768	3.1	75	3.49	2.31	.18	—.14
7	28.0	37.4	.....	.....	2600	3210	2905	21.0	1266	19.76	1.28	18.48	13.42
8	27.6	37.4	.....	.....	2640	3135	2888	21.93	1302	20.56	3.36	17.20	11.99
14[2]	15.5	19.0	.....	.....	1710	1900	1805	—12.1	—395	—10.05	.63	—10.68	—9.10
15[2]	29.4	36.9	.....	.....	2750	2815	2783	5.8	5.83	6.39	3.99	2.40	.07
18[2]	19.9	31.1	.....	.....	2395	2005	2200						

TABLE I—
RESULTS IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
1	69.2 pounds 13% blood=N=	9					
2	150 pounds 14% acid phosphate=P=		21				
3	22.5 pounds 20% manure salt=K=			4.5			
4	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
5	69.2 pounds 13% blood=N=	9					
	22.5 pounds 20% manure salt=K=			4.5			
12[2]	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
6	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
8	Unfertilized=O=						
8[2]	Unfertilized=O=						
7[2]	500 pounds unslaked lime every fourth year=L=						
8[2]	Unfertilized=O=						
9[2]	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
	500 pounds unslaked lime every fourth year=L=						

Continued.

FIELD C IN 1909.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8.00 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1909	Ave.	1903	1904	1906	1909	Ave						
1	26 5	26.5	.....	.....	.....	2140	2140	6.5	4.70	$ 6.43	$ 2.08	$ 4.35	$ 2.47
2	27.4	27.4	.....	.....	.....	2192	2192	7.4	522	7.27	1.05	6.22	4.13
3	19.7	19.7	.....	.....	.....	1490	1490	—.3	—180	—.93	.23	—1.16	—.44
4	36.3	36.3	.....	.....	.....	2590	2590	16.3	920	15.09	3.13	11.96	8.28
5	21.2	21.2	.....	.....	.....	2014	2014	1.2	344	2.22	2.31	—.09	—1.47
12[2]	23.8	23.8	.....	.....	.....	2420	2420	12.5	1290	13.91	1.28	12.63	7.47
6	38.7	38.7	.....	.....	.....	2902	2902	18.7	1232	18.02	3.36	14.66	9.73
8	20.0	20.0	.....	.....	.....	1670	1670	.....	.....	.....	.....	.....	.....
8[2]	11.3	11.3	.....	.....	.....	1130	1130	.....	.....	.....	.....	.....	.....
7[2]	21.1	21.1	.....	.....	.....	1600	1600	9.8	470	8.74	.63	8.11	6.23
8[2]	11.3	11.3	.....	.....	.....	1130	1130	.....	.....	.....	.....	.....	.....
9[2]	39.7	39.7	.....	.....	.....	2460	2460	28.4	1330	25.20	3.99	21.21	15.89

TABLE I

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre.		
					1903	1904	1906
5^2–4–8	Unfertilized=.....O=						
3^2–1–1	69.2 pounds 13% blood=.....N=	9					
4^2–2–2	150 pounds 14% acid phosphate=.....P=		21				
(5^2+14^2)–4–8	Unfertilized=.....O=						
6^2–3–3	22.5 pounds 20% manure salt=.....K=			4.5			
(5^2+14^2)–(4+11)–8	Unfertilized=.....O=						
7^2–5–4	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				
(5^2+14^2)–(4+11)–8	Unfertilized=.....O=						
8^2–6–5	69.2 pounds 13% blood=.....N=	9					
	22.5 pounds 20% manure salt=.....K=			4.5			
(5^2+14^2)–(4+11)–8	Unfertilized=.....O=						
10^2–8–6	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
(5^2+14^2)–(4+11)–8	Unfertilized=.....O=						
9^2–7–12^2	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
5^4–18^2–8^2	Unfertilized=.....O=						
4^4–14^2–7^2	500 pounds unslaked lime every fourth year=.....L=						
6^4–15^2–9^2	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
	500 pounds unslaked lime every fourth year=.....L=						

— Loss. * By mistake this plat had normal application of potash in 1906. The indications are that this

Checks for plats 5, 6, 7 and 8, Field A, and plats 6^2, 7^2, 8^2 9^2 and 10^2, Field B, have been obtained from plats natural fertility between check plats and a corrected check was figured on this basis for each treated plat

Continued.

YEARS IN FIELDS A, B, AND C.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8.00 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
5^2-4-8	.....	19.5	.....	.....	.....	.....	1785	.....	.....	.....	.....	.....	.....
3^2-1-1	.....	20.1	.....	.....	.....	.....	1712	.6	—73	$ .13	$ 2.08	$ —1.95	$ —1.66
4^2-2-2	.....	25.7	.....	.....	.....	.....	2003	6.2	291	5.50	1.05	4.05	3.29
(5^2+14^2)-4-8	.....	19.1	.....	.....	.....	.....	1751	.....	.....	.....	.....	.....	.....
6^2-3-3	.....	19.2	.....	.....	.....	.....	1781	.1	—113	—.38	.23	—.61	—.16
(5^2+14^2)-(4+11)-8	.....	18.5	.....	.....	.....	.....	1700	.....	.....	.....	.....	.....	.....
7^2-5-4	.....	37.3	.....	.....	.....	.....	2633	18.8	901	16.89	3.13	13.76	10.03
(5^2+14^2)-(4+11)-8	.....	17.9	.....	.....	.....	.....	1650	.....	.....	.....	.....	.....	.....
8^2-6-5	.....	19.5	.....	.....	.....	.....	1801	1.5	151	1.65	2.31	—.66	—1.26
(5^2+14^2)-(4+11)-8	.....	16.8	.....	.....	.....	.....	1549	.....	.....	.....	.....	.....	.....
10^2-8-6	.....	35.9	.....	.....	.....	.....	2308	19.1	1069	17.65	3.36	14.29	10.01
(5^2+14^2)-(4+11)-8	.....	16.1	.....	.....	.....	.....	1523	.....	.....	.....	.....	.....	.....
9^2-7-12^2	.....	3.26	.....	.....	.....	.....	2538	16.5	1015	15.61	1.28	14.25	10.27
5^5-18^2-8^2	.....	17.6	.....	.....	.....	.....	1485	.....	.....	.....	.....	.....	.....
4^4-14^2-7^2	.....	16.1	.....	.....	.....	.....	1443	—1.47	—42	—1.19	.63	—1.82	—1.66
6^4-15^2-9^2	.....	31.8	.....	.....	.....	.....	2211	14.2	726	12.84	3.99	8.85	5.95

did not effect the yield, as the average yields for the unfertilized potash plats are near the same.

4 and 11, and 5^2 and 14^2 respectively. It has been assumed that there is a uniform increase or decrease in the between checks.

EFFECT OF NITROGEN, PHOSPHORIC ACID, POTASH, AND LIME ALONE AND IN COMBINATION WITH EACH OTHER ON CORN YIELDS.

The experiments, the results of which are presented in Table I, were planned to show the effect on the yield of corn of nitrogen (N), phosphoric acid (P), and potash (K) when applied singly, when two of the constituents were applied together, as nitrogen and phosphoric acid (N P), nitrogen and potash (N K), and phosphoric acid and potash (P K), and when all three of these fertilizer constituents were applied to make a complete fertilizer (N P K); also to test the effect of lime (L) when used alone and when used in connection with a complete fertilizer (N P K L).

The results are shown in yields of bushels of shelled corn and pounds of stover per acre for the several years, average yields, average increases over the unfertilized (O) plats, which represent the effect of the fertilizer applications, the value of the increase, the cost of the fertilizer, and the value of the increased yield of corn and stover and of corn alone over cost of fertilizer. The value of the increased yield of corn and stover and of corn alone represent the profit from the several fertilizer applications after paying for the fertilizer itself.

In these experiments the corn was cut, shocked and shredded, the *stover* being all of the plant except the corn on the cob.

Nitrogen, N (Plats 3^2, 1 and 1). During six years the average results on the plats in Fields A and B show decreased yields and in the value of product, while for one year in Field C there was a gain from the use of nitrogen, the average results for the plats in the three fields being an actual loss in both yield and value of product from the application of nitrogen alone. The average annual loss was $1.95 per acre on basis of corn and stover and $1.66 per acre on basis of corn alone.

Phosphoric Acid, P (Plats 4^2, 2 and 2). Phosphoric acid alone produced increased yields in all of the seven years on the plats in the three fields, the average increase for four years in Field B being 6.5 bushels of corn per acre, for two years in Field A 5 bushels, and for one year in Field C 7.4 bushels, or an average for seven years in all three fields of 6.2 bushels, worth at 70 cents per bushel $3.29 per acre for corn alone, or $4.05 for increased yield of corn and stover over cost of fertilizer.

Potash, K (Plats 6^2, 3 and 3). Except the first year in Field B, there was less corn produced on the plats receiving potash alone than on the unfertilized plats, the average for the seven years being slightly less where potash was used than where no fertilizer was applied, and the potash was used at a loss.

Nitrogen and Phosphoric Acid N P (Plats 7^2, 5 and 4). From nitrogen and phosphoric acid increased yields over the unfertilized plats were obtained in all seven years in the three fields, the average annual increase for the four years in Field B being 17.5 bushels of corn per acre; for two years in Field A 22.4 bushels of corn per acre, and for one year in Field C 16.3 bushels, or an average annual increase for seven years in the three fields of 18.8 bushels of corn, worth 10.03 over cost of fertilizer for corn alone, or $13.76 for the increased yield of corn and stover. This was 12.62 bushels more corn, worth $6.74, than phosphoric acid alone produced, showing that nitrogen has added decidedly to the yield and profit when combined with phosphoric acid, though alone it was used at a loss.

Nitrogen and Potash, N K (Plats 8^2, 6 and 5). There were small average increased yields of corn in the three fields from applications of nitrogen and potash combined, the average for the seven years in the three fields being 1.5 bushels per acre, which was not sufficient to pay for the fertilizer. This fertilization was therefore at a loss, having cost $1.26 per acre more annually than the value of the increased yield of corn.

Phosphoric Acid and Potash, P K (Plats 9^2, 7 and 12^2). Phosphoric acid and potash combined gave increased yields on all the plats in the three fields, the average annual increase for four years in Field B being 15.2 bushels of corn per acre, for two years in Field A 21 bushels, and for one year in Field C 12.5 bushels, or an average for the seven years in the two fields of 16.5 bushels, worth $10.27 over cost of fertilizer on basis of corn alone, or $14.25 on basis of corn and stover. From this it is seen that potash added to phosphoric acid has increased the yield of corn 10.3 bushels more than phosphoric acid alone, at a profit of $6.98 over cost of fertilizer, showing that potash was effective in corn production on this soil when used in connection with phosphoric acid, but valueless when used alone.

Phosphoric Acid, Potash and Nitrogen, N P K (Plats 10^2, 8 and 6.) When all three of the fertilizer materials were used together to make a complete fertilizer, increased yields were obtained on all three plats in the three fields, the average annual increase for four years in Field B being 17.8 bushels of corn per acre, for two years in Field A 21.9 bushels and for one year in Field C 18.7 bushels, or an annual average increase for the seven years in the three fields of 19.1 bushels, worth $10.01 over cost of fertilizer on basis of corn alone, or $14.29 on basis of corn and stover.

When compared with each other these results show that nitrogen added to phosphoric acid, potash added to phosphoric acid, and nitrogen and potash added to phosphoric acid have yielded practically the same profits, though nitrogen and phosphoric acid have produced

largest average increased yields over unfertilized plats (18.8 bushels per acre), than phosphoric acid and potash (16.5 bushels per acre), and nitrogen, phosphoric acid and potash were larger than either of the other two (19.1 bushels per acre). This indicates that nitrogen is more important on this soil than potash for corn production.

Lime, L (Plats 4^1, 14^2, and 7^2). Lime was applied at the rate of 500 pounds rock or 1,000 pounds slaked lime per acre every fourth year. On the plats in Field B during four years there was a profit of 14 cents per acre from the use of lime. On the plats in Field A there was a loss of $9.10 annually per acre, and on the plat in Field C in one year's test a profit of $6.23, the average for the seven years being a loss of $1.66 per acre. The plat in Field C, where there was a profit from the use of lime, had been in peas after grain during four previous years.

Lime with Complete Fertilizer N P K L (Plats 6^4, 15^2 and 9^2). When lime was used in combination with the three fertilizer constituents there was less corn produced on all the plats in Fields B and A than where the three fertilizer constituents were used without lime, but on the plat in Field C, which had previously been in peas and grain for four years, there was a decided gain from the use of lime. As an average of all the tests there was smaller increased yield of corn and profit where lime was used than where it was not.

As an average of all the results, the experiments show—

(1) That nitrogen alone on this soil for the production of corn was used at a loss;

(2) That potash alone had practically no effect on the yield and was used at a loss;

(3) That nitrogen and potash combined increased the yield very slightly but at a loss;

(4) That lime alone, except where peas had been previously grown, was used at a loss;

(5) That phosphoric acid alone gave increased yields and profits in all cases, showing that it is the most important constituent for corn production on this soil;

(6) That nitrogen combined with phosphoric acid added decidedly to the increased yields and profits, the average annual increase for phosphoric acid alone being 6.2 bushels and for nitrogen and phosphoric acid 18.8 bushels per acre;

(7) That potash added to phosphoric acid increased the yields decidedly over phosphoric acid alone, the average annual increase for phosphoric acid alone being 6.2 bushels per acre, and for phosphoric acid and potash 16.5 bushels;

(8) That potash added to nitrogen and phosphoric acid was at a small increase in yield and without profit; and

(9) That the yields from the addition of lime to nitrogen, phosphoric acid and potash were smaller than from the three fertilizer constituents combined.

The most important constituent in producing increased yields and profits on this soil was phosphoric acid. Nitrogen and potash singly or combined, gave good returns when used with phosphoric acid, but were of little or no value when used alone or with each other. Nitrogen added more largely to the yields than did potash.

TABLE II—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON ON

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
11[2]	34.6 pounds 13% blood=½N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	4.5	21	4.5	35.7	38.3	41.5
5[2]–14[2]	Unfertilized=O				21.8	20.2	15.9
10[2]	69.2 pounds 13% blood=N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	9	21	4.5	34.2	37.1	43.2
12[2]	138.4 pounds 13% blood=2N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	18	21	4.5	34.6	44.2	46.7
13[2]	207.6 pounds 13% blood=3N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	27	21	4.5	35.7	45.6	47.3
14[2]	Unfertilized=O				23.1	15.7	10.5

RESULTS IN FIELD

					1905
9	34.6 pounds 13% blood=½N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	4.5	21	4.5	41.8
4–1	Unfertilized=O				22.2
8	69.2 pounds 13% blood=N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	9	21	4.5	47.8
10	138.4 pounds 13% blood=2N 150 pounds 14% acid phosphate=P 22.5 pounds 20% manure salt=K	18	21	4.5	49.0
11	Unfertilized=O				19.9

IREDELL TEST FARM; EFFECTS OF VARYING QUANTITIES OF NITROGEN YIELDS.

IN 1903, '04, '06, AND '08

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fert.
	1908	Ave.	1903	1904	1906	1908	Ave.						
11[2]	23.7	34.6	1970	2690	2902	2120	2421	18.96	981	$ 17.20	$ 2.32	$ 14.88	$ 10.95
5[2]–14[2]	8.3	16.5	1625	1680	1750	1665	1680	.....	.....	.....	.....	.....	.....
10[2]	22.8	34.3	1670	2965	3180	1835	2413	17.8	911	16.10	3.36	12.74	9.10
12[2]	27.7	38.4	2040	2890	3720	2475	2781	23.1	1402	21.81	5.44	16.37	10.76
13[2]	26.7	38.6	1870	3150	3332	2250	2651	24.3	1333	22.34	7.52	14.82	9.49
14[2]	6.0	13.8	1425	1400	1392	810	1257	.....	.....	.....	.....	.....	.....

A IN 1905 AND 1907.

	1907				1905	1907							
9	26.8	34.3	.....	.....	2425	1640	2033	19.2	501	15.44	2.32	13.12	11.12
4–11	9.4	15.8	.....	.....	1822	1349	1585	.....	.....	.....	.....	.....	.....
8	27.6	37.7	.....	.....	2640	3135	2888	21.93	1302	20.56	3.36	17.20	11.99
10	27.7	35.9	.....	.....	2113	2925	2519	23.89	1040	20.89	5.44	15.45	11.28
11	7.7	13.8	.....	.....	1625	1225	1425	.....	.....	.....	.....	.....	.....

TABLE II—

RESULTS IN FIELD A

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906	1905
12	207.6 pounds 13% blood=3N=	27						
	150 pounds 14% acid phosphate=P=		21					56.4
	22.5 pounds 20% manure salt=K=			4.5				

RESULTS IN

7	34.6 pounds 13% blood=½N=	4.5						
	150 pounds 14% acid phosphate=P=		21					
	22.5 pounds 20% manure salt=K=			4.5				
8	Unfertilized=O=							
6	69.2 pounds 13% blood=N=	9						
	150 pounds 14% acid phosphate=P=		21					
	22.5 pounds 20% manure salt=K=			4.5				
9	138.4 pounds 13% blood=2N=	18						
	150 pounds 14% acid phosphate=P=		21					
	22.5 pounds 20% manure salt=K=			4.5				
10	207.6 pounds 13% blood=3N=	27						
	150 pounds 14% acid phosphate=P=		21					
	22.5 pounds 20% manure salt=K=			4.5				

AVERAGE RESULTS FOR SEVEN

$(5^2+14^2)-(4+11)-8$	Unfertilized=O=							
11^2-9-7	34.6 pounds 13% blood=½N=	4.5						
	150 pounds 14% acid phosphate=P=		21					
	22.5 pounds 20% manure salt=K=			4.5				
$(5^2+11^2)-(4+11)-8$	Unfertilized=O=							
0^2-8-6	69.2 pounds 13% blood=N=	9						
	150 pounds 14% acid phosphate=P=		21					
	22.5 pounds 20% manure salt=K=			4.5				

Continued.

IN 1905 AND 1905.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $ 70 per Bushel and Stover at $8.60 per Ton	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1905	1908	Ave.						
	1907				1905	1907							
12	27.1	41.8	.....	.....	2990	2665	2828	28.0	1403	$25.21	$ 7.52	$ 17.69	$ 12.08
FIELD C IN 1909.													
	1909												
7	42.1	42.1	.....	.....	.....	3000	3000	22.1	1330	20.79	2.32	18.47	13.15
8	20.0	20.0	.....	.....	.....	1670	1670	.....	.....	.....	.....	.....	.....
6	38.7	38.7	.....	.....	.....	2902	2902	18.7	1232	18.02	3.36	14.66	9.73
9	48.5	48.5	.....	.....	.....	3080	3080	28.5	1410	25.59	5.44	20.15	14.51
10	45.8	45.8	.....	.....	.....	2460	2460	25.8	790	21.22	7.52	13.70	10.54
YEARS IN FIELDS A, B, AND C.													
$(5^2+14^2)-(4+11)-8$	.....	16.2	.....	.....	.....	.....	1499	.....	.....	.....	.....	.....	.....
11^2-9-7	.....	35.7	.....	.....	.....	.....	2392	19.5	893	17.22	2.32	14.90	11.33
$(5^2+14^2)-(4+11)-8$	.....	16.8	.....	.....	.....	.....	1519	.....	.....	.....	.....	.....	.....
10-8-6	.....	35.9	.....	.....	.....	.....	2618	19.1	1069	17.65	3.36	14.29	10.01

TABLE II—

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
(5^2+14^2)-(4+11)-8	Unfertilized=.....O=						
12^2–10–9	138.4 pounds 13% blood=.....2N=	18					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
(5^2-14^2)-(4+11)-8	Unfertilized=.....O=						
13^2–12–10	207.6 pounds 13% blood=.....3N=	27					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			

Checks for plats 8, 9 and 10, Field A, and plats 10^2, 11^2, 12^2 and 13^2, Field B, have been obtained from plat natural fertility between check plats and a corrected check was figured on this basis for each treated plat

THE EFFECT OF VARYING QUANTITIES OF NITROGEN.

The experiments in Table II were planned to test the effect on the yield of corn and stover of varying quantities of nitrogen, leaving the phosphoric acid and potash constant.

On one plat the nitrogen was reduced to one-half the normal quantity, making the application 4½ pounds of nitrogen per acre, or practically 1½ per cent in the fertilizer mixture. On two of the plats it was increased by two and three times the normal quantity (9 pounds per acre), making the application 18 and 27 pounds per acre respectively, or on the four plats 4½, 9, 18, and 27 pounds of nitrogen per acre.

The average results for four years in Field B showed the largest profit to have come from the application containing twice the normal quantity of nitrogen per acre, or 18 pounds of nitrogen, the average yield being 38.4 bushels corn per acre, and the profit $10.76 over cost of fertilizer on basis of corn alone or $16.37 on basis of corn and stover. For two years in Field A the largest yields and profit were from the application containing three times the normal quantity of nitrogen, or 27 pounds nitrogen per acre, the average yield of corn being 41.8 bushels per acre, and the profit $12.08 over cost of fertilizer, on basis of corn alone, or $17.69 on basis of corn

Continued.

YEARS IN FIELDS A, B, AND C.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.	Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908 Ave.	1903	1904	1906	1908	Ave.						
(5^2+14^2)-(4+11)-5	15.6					1449						
12^2-10-9	39.8					2749	24.2	1300	$22.44	$ 5.44	$ 16.70	$ 11.50
(5^2-14^2)-(4+11)-8	15.1					1399						
13^2-12-10	40.7					2674	25.6	1275	23.02	7.52	15.50	10.40

4 and 11 and 5^2 and 14^2 respectively. It has been assumed that there is a uniform increase or decrease in the between checks.

and stover. In one year in Field C twice the normal quantity of nitrogen gave the best returns, the yield of corn being 48.5 bushels, and the profit $14.51 over cost of fertilizer on basis of corn alone and $20.15 on basis of corn and stover. As an average for the seven years 18 pounds of nitrogen per acre (twice the normal quantity) gave the largest profits, though 27 pounds of nitrogen gave slightly the largest yield of corn.

These results emphasize the importance of nitrogen for the production of corn on this soil when applied in connection with the proper amount of phosphoric acid and some potash.

The fertilizer application which gave best results in these tests (N_2 P K) cost $5.44 per acre and yielded a profit of $11.50 over cost of fertilizer, on basis of corn alone, or $16.70 on basis of corn and stover. The average yield of corn during the seven years from this fertilization was 39.8 bushels of corn per acre; the yield without fertilizer was 15.6 bushels per acre, or an annual average increase of 24.2 bushels per acre due to fertilizer. Without fertilizer the land lost rapidly in productiveness, while with the larger quantities of nitrogen (18 and 27 pounds per acre) there were larger yields in after years than in the first year, the average for the entire seven years being larger than for the first year.

TABLE III—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON PHORIC

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
14[2]	Unfertilized=.....O=				23.1	15.7	10.5
15[2]	69.2 pounds 13% blood=.....N=	9					
	75 pounds 14% acid phosphate=.....½P=		10.5		33.8	35.7	34.0
	22.5 pounds 20% manure salt=.....K=			4.5			
5[2]+14[2]	Unfertilized=.....O=				21.8	20.2	15.9
10[2]	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21		34.2	37.1	43.2
	22.5 pounds 20% manure salt=.....K=			4.5			
1[3]	69.2 pounds 13% blood=.....N=	9					
	300 pounds 14% acid phosphate=.....2P=		42		32.7	29.0	28.0
	22.5 pounds 20% manure salt=.....K=						
2[3]	69.2 pounds 13% blood=.....N=	9					
	450 pounds 14% acid phosphate=.....3P=		63		22.7	29.7	26.3
	22.5 pounds 20% manure salt=.....K=			4.5			
5[3]	Unfertilized=.....O=				24.2	10.6	13.3

RELULTS IN FIELD

					1905
13	69.2 pounds 13% blood=.....N=	9			
	75 pounds 14% acid phosphate=.....½P=		10.5		46.6
	22.5 pounds 20% manure salt=.....K=			4.5	
(4+11)	Unfertilized=.....O=				22.2
8	69.2 pounds 13% blood=.....N=	9			
	150 pounds 14% acid phosphate=.....P=		21		47.8
	22.5 pounds 20% manure salt=.....K=			4.5	
14	69.2 pounds 13% blood=.....N=	9			
	300 pounds 14% acid phosphate=.....2P=		42		47.0
	22.5 pounds 20% manure salt=.....K=			4.5	

IRELELL TEST FARM; EFFECTS OF VARYING QUANTITIES OF PHOS-ACID.

IN 1903, '04 '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $5 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
14[2]	6.0	13.8	1425	1400	1392	810	1257	.....	.....	.....	.....	.....	.....
15[2]	16.6	30.1	2000	2515	2690	1840	2261	16.3	1004	$15.37	$ 2.84	$ 12.53	$ 8.57
5[2]+14[2]	8.3	16.5	1625	1680	1750	1665	1680	.....	.....	.....	.....	.....	.....
10[2]	22.8	34.3	1670	2965	3180	1835	2413	17.8	911	16.10	.36	12.74	9.10
1[3]	22.9	28.2	2125	2560	2325	2180	2298	14.93	678	13.16	4.41	8.75	6.04
2[3]	24.9	25.9	2655	2465	2495	2085	2425	12.68	805	12.10	5.46	6.64	3.42
5[3]	4.8	15.7	1650	1990	1640	1200	1620	.....	.....	.....	.....	.....	.....

A IN 1905 AND 1907.

	1907				1905	1907							
13	26.7	36.7	.....	.....	3220	2795	3008	5.55	808	7.12	2.84	4.28	
(4+11)	9.4	15.8	.....	.....	1822	1349	1585	.....	.....	.....	.....	.....	.....
8	27.6	37.7	.....	.....	2640	3135	2888	21.93	1302	20.56	3.36	17.20	11.99
14	25.8	36.4	.....	.....	2890	3305	3098	5.3	898	7.30	4.41	2.89	—.70

TABLE III—

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
5[2]-18-8	Unfertilized=.....O=						
1[2]-14-12	69.2 pounds 13% blood=.....N=	9					
	300 pounds 14% acid phosphate=.....2P=		42				
	22.5 pounds 20% manure salt=.....K=			4.5			
2[2]-15-13	69.2 pounds 13% blood=.....N=	9					
	450 pounds 14% acid phosphate=.....3P=		63				
	22.5 pounds 20% manure salt=.....K=			4.5			

Checks for plat 8, Field A, and plat 10[2], Field B, have been obtained from plats 4 and 11, and 5[2] and 14[2], respectively. It has been assumed that there is a uniform increase or decrease in the natural fertility between

THE EFFECT OF VARYING QUANTITIES OF PHOSPHORIC ACID.

The above experiments in Table III were planned to show the effect on yields of corn and stover of varying quantities of phosphoric acid, the nitrogen and potash remaining the same. On one plat one-half the normal quantity of phosphoric acid was applied or an amount represented by 75 pounds of 14 per cent acid phosphate and equivalent to 3½ per cent phosphoric acid in the fertilizer mixture. On two plats were applied two and three times the normal quantities of phosphoric acid represented by 300 and 450 pounds of 14

TABLE IV—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
3[2]	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21		28.8	26.4	26.9
	11.2 pounds 20% manure salt=.....½K=			2.2			

Continued.

YEARS IN FIELDS A, B AND C.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
5[3]-18-8	.....	19.3	.....	.....	.....	.....	1793	.....	.....	.....	.....	.....	.....
1[3]-14-12	.....	31.3	.....	.....	.....	.....	2551	12.0	758	$11.43	$ 4.41	$ 7.02	$ 3.99
2[3]-15-13	.....	30.2	.....	.....	.....	.....	2607	10.94	814	10.91	5.46	5.45	2.20

check plats and a corrected check was figured on this basis for each treated plat between checks.

per cent acid phosphate respectively, or 42 and 63 pounds of phosphoric acid per acre. The results in all the fields show increased yields and profits for all the quantities of phosphoric acid, but the largest yields, increases and profits in all the fields were from the plats receiving the normal quantity of phosphoric acid or 150 pounds of 14 per cent acid phosphate, which is equal to 21 pounds of phosphoric acid per acre. Larger quantities than the above of phosphoric acid did not add to the yields of corn when the quantities of nitrogen and potash remained the same.

IREDELL TEST FARM; EFFECTS OF VARYING QUANTITIES OF POTASH.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
3[3]	21.9	26.0	1990	1685	2705	2100	2120	10.3	500	$10.95	$ 3.25	$ 7.70	$ 3.96

TABLE III—AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
5^1-18-8	Unfertilized=.....O=						
1^1-14-12	69.2 pounds 13% blood=.....N=	9					
	300 pounds 14% acid phosphate=.....2P=		42				
	22.5 pounds 20% manure salt=.....K=			4.5			
2^1-15-13	69.2 pounds 13% blood=.....N=	9					
	450 pounds 14% acid phosphate=.....3P=		63				
	22.5 pounds 20% manure salt=.....K=			4.5			

Checks for plat 8, Field A, and plat 10^2, Field B, have been obtained from plats 4 and 11, and 5^2 and 14^2, respectively. It has been assumed that there is a uniform increase or decrease in the natural fertility between

THE EFFECT OF VARYING QUANTITIES OF PHOSPHORIC ACID.

The above experiments in Table III were planned to show the effect on yields of corn and stover of varying quantities of phosphoric acid, the nitrogen and potash remaining the same. On one plat one-half the normal quantity of phosphoric acid was applied or an amount represented by 75 pounds of 14 per cent acid phosphate and equivalent to $3\frac{1}{2}$ per cent phosphoric acid in the fertilizer mixture. On two plats were applied two and three times the normal quantities of phosphoric acid represented by 300 and 450 pounds of 14

TABLE IV—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
3^2	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21		28.8	26.4	26.9
	11.2 pounds 20% manure salt=.....½K=			2.2			

Continued.

YEARS IN FIELDS A, B AND C.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
53-18-8	.....	19.3	.....	.....	.....	.....	1793	.....	.....	.....	.....	.....	.....
13-14-12	.....	31.3	.....	.....	.....	.....	2551	12.0	758	$11.43	$ 4.41	$ 7.02	$ 3.99
23-15-13	.....	30.2	.....	.....	.....	.....	2607	10.94	814	10.91	5.46	5.45	2.20

check plats and a corrected check was figured on this basis for each treated plat between checks.

per cent acid phosphate respectively, or 42 and 63 pounds of phosphoric acid per acre. The results in all the fields show increased yields and profits for all the quantities of phosphoric acid, but the largest yields, increases and profits in all the fields were from the plats receiving the normal quantity of phosphoric acid or 150 pounds of 14 per cent acid phosphate, which is equal to 21 pounds of phosphoric acid per acre. Larger quantities than the above of phosphoric acid did not add to the yields of corn when the quantities of nitrogen and potash remained the same.

IREDELL TEST FARM; EFFECTS OF VARYING QUANTITIES OF POTASH.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
33	21.9	26.0	1990	1685	2705	2100	2120	10.3	500	$10.95	$ 3.25	$ 7.70	$ 3.96

TABLE IV—

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre.		
					1903	1904	1906
(5^2+14^2)	Unfertilized=.....O=				21.8	20.2	15.9
10^2	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21		34.2	37.1	43.2
	22.5 pounds 20% manure salt.....K=			4.5			
4^3	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21		29.1	27.2	28.2
	45 pounds 20% manure salt=.....2K=			9			
5^3	Unfertilized=.....O=				24.2	10.6	13.3
6^3	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21		29.9	25.3	22.9
	67.5 pounds 20% manure salt=.....3K=			13.5			

RESULTS IN FIELD

16	69.2 pounds 13% blood=.....N=	9					1905
	150 pounds 14% acid phosphate=.....P=		21				44.2
	11.2 pounds 20% manure salt=.....½K=			2.2			
(4+11)	Unfertilized=.....O=						22.2
8	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				47.8
	22.5 pounds 20% manure salt=.....K=			4.5			
17	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				41.7
	45 pounds 20% manure salt=.....2K=			9			
18	Unfertilized=.....O=						42.3
19	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				54.8
	67.5 pounds 20% manure salt=.....3K=			13.5			

Continued.

IN 1903, '01, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.	Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $5 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	1903	1901	1906	1908	Ave.						
(5[2]+14[2])	8.3	16.5	1625	1680	1750	1665	1680					
10[3]	22.8	34.3	1670	2965	3180	1835	2413	17.8	911	$16.10	$ 3.36	$ 12.74	$ 9.10
4[3]	19.9	26.1	1915	2330	2910	2050	2301	12.88	681	11 74	3.59	8.15	5 43
5[3]	4.8	15.7	1650	1990	1610	1200	1620						
6[3]	18.6	24.2	1865	2160	2593	1640	2065	11.46	525	10.12	3.82	6.30	4.20

A IN 1905 AND 1907.

	1907				1905	1907						
16	23.4	33.8	.....	.....	2370	2820	2595	2.7	395	3.47	3.25	.22	—1.36
(4+11)	9.4	15.8	.....	.....	1822	1349	1585						
8	27.6	37.7	.....	.....	2640	3135	2888	21.93	1302	20.56	3.36	17.20	11.99
17	25.9	33.8	.....	.....	2530	3350	2940	2.7	740	4.85	3.59	1.26	—1.70
18	19.9	31.1	2395	2005	2200								
19	28.4	41.6	.....	.....	2895	5130	4013	10.5	1813	14.60	3.82	10.78	3.53

TABLE IV—

RESULTS IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
14	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	11.2 pounds 20% manure salt=½K=			2.2			
6	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
15	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	45 pounds 20% manure salt=2K=			9			
16	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	67.5 pounds 20% manure salt=3K=			13.5			
8	Unfertilized=O=						

AVERAGE RESULTS FOR SEVEN

5^2-18-8	Unfertilized=O=						
3^2-16-14	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	11.2 pounds 20% manure salt=½K=			2.2			
(5^2+14^2) $(4+11)$-8	Unfertilized=O=						
10^2-8-6	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
$(4^2$-17-15)	Unfertilized=O=						
(5^2+14^2) -18-8	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	45 pounds 20% manure salt=2K=			9			

Continued.

FIELD C IN 1909.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $ 70 per Bushel and Stover at $5 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1909	Ave.	1903	1904	1906	1908	Ave.						
						1909							
14	27.4	27.4	.....	.....	.....	2055	2055	7.4	385	$ 6.72	$ 3.25	$ 3.47	$ 1.93
6	38.7	38.7	.....	.....	.....	2902	2902	18.7	1232	18.02	3.36	14.66	9.73
15	27.5	27.5	.....	.....	.....	2062	2062	7.5	392	6.82	3.59	3.23	1.66
16	28.3	28.3	.....	.....	.....	2120	2120	8.3	450	7.61	3.82	3.79	1.99
8	20.0	20.0	.....	.....	.....	1670	1670	.....	.....	.....	.....	.....	.....

YEARS IN FIELDS A, B, AND C.

5^2-18-8	.....	19.3	.....	.....	.....	.....	1793	.....	.....	.....	.....	.....	.....
3^2-16-14	.....	28.4	.....	.....	.....	.....	2246	9.1	453	8.18	3.25	4.93	3.12
(5^2+14^2)-(4+11)-8	.....	16.8	.....	.....	.....	.....	1549	.....	.....	.....	.....	.....	.....
10^2-8-6	.....	35.9	.....	.....	.....	.....	2308	19.1	1069	17.65	3.36	14.29	10.01
$(4^2$-17-15)	.....	20.3	.....	.....	.....	.....	1747	.....	.....	.....	.....	.....	.....
(5^2+14^2)-18-8	.....	28.5	.....	.....	.....	.....	2450	9.2	703	9.25	3.59	5.66	2.85

TABLE IV—

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
6^3-19-16	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				
	67.5 pounds 20% manure salt=.....3K=			13.5			

The check for plat 8, Field A, has been obtained from plats 4 and 11; that for plat 10^2, Field B, from plats 5^2 and 14^2, and for plat 6^3, Field B, from plats 5^3 and 14^3. It has been assumed that there is a uniform increase

THE EFFECT OF DIFFERENT QUANTITIES OF POTASH.

The experiments reported in Table IV were arranged to show the effect on the yield of corn and stover of varying quantities of potash, the nitrogen and phosphoric acid remaining constant. On one plat only one-half the normal quantity of potash was applied or ¾ per cent in the fertilizer mixture, or 2.2 pounds of potash per acre. On two other plats two and three times the normal quantities were given, or 9 and 13.5 pounds per acre respectively. This would make the application of potash on the several plats 2.2, 4.5, 9, and 13.5 pounds. The results in all of the fields are uniform in showing that the larger quantities were not as profitable as the normal

TABLE V—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON IRE

ON

RESULTS ON FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushel of Shelled Corns per Acre. 1903	1904	1906
5^3	Unfertilized=.....O=				24.2	10.6	13.3
7^3	34.6 pounds 13% blood=.....½N=	4.5					
	75 pounds 14% acid phosphate=.....½P=		10.5		25.2	22.9	23.0
	11.2 pounds 20% manure salt=.....½K=			2.2			
(5^2+14^2)	Unfertilized=.....O=				21.8	20.2	19.5

Continued.

YEARS IN FIELDS A, B, AND C.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.	Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908 Ave.	1903	1904	1906	1908	Ave.						
6[2] 19-16	29.7					2629	10.67	882	$11.00	$ 3.82	$ 7.18	$ 3.65

or decrease in the natural fertility between check plats and a corrected check was figured on this basis for each treated plat between checks.

amount, 1½ per cent in the fertilizer mixture, or 4½ pounds per acre. Neither was a very small quantity, ¾ per cent in the fertilizer mixture, or 2.2 pounds per acre, as profitable or as effective in increasing yields as the normal quantity.

The indications are that 1½ per cent of potash is all that is needed for corn in this soil when used in connection with the regular quantities of nitrogen and phosphoric acid in the normal corn mixture.

The results further throw light on the comparative values of nitrogen and potash for corn on this soil and give unquestionably a more important place to nitrogen than potash.

DELL TEST FARM; EFFECT OF VARYING QUANTITIES OF FERTILIZERS YIELD.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.	Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fert.
	1908 Ave.	1903	1904	1906	1908	Ave.						
5[3]	4.8 15.7	1650	1990	1640	1200	1620						
7[3]	13.8 21.2	1485	1965	2290	1890	1908	8.96	448	$ 8.06	$ 1.68	$ 6.38	$ 4.59
(5[2]+14[2])	8.3 16.	1625	1680	1750	1665	1680						

TABLE V—

RESULTS ON FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre	Pounds of Phosphoric Acid (P_2O_5) per Acre	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
10[2]	69.2 pounds 13% blood=N=	9			34.2	37.1	43.2
	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
8[3]	103.8 pounds 13% blood=1½N=	13.5			32.6	44.5	47.9
	225 pounds 14% acid phosphate=1½P=		31.5				
	33.7 pounds 20% manure salt=1½K=			6.7			
9[2]	138.4 pounds 13% blood=2N=	1.8			28.8	37.9	41.2
	300 pounds 14% acid phosphate=2P=		42				
	45 pounds 20% manure salt=2K=			9			
10[3]	173 pounds 13% blood=2½N=	22.5			35.0	45.0	52.0
	375 pounds 14% acid phosphate=2½P=		52.5				
	56.2 pounds 20% manure salt=2½K=			11.2			
14[3]	Unfertilized=O=				25.8	6.0	3.5

RESULTS IN FIELD A

					1905
18	Unfertilized=O=				42.3
20	34.6 pounds 13% blood=½N=	4.5			48.6
	75 pounds 14% acid phosphate=½P=		10.5		
	11.2 pounds 20% manure salt=½K=			2.2	
(4+11)	Unfertilized=O=				22.2
8	69.2 pounds 13% blood=N=	9			47.8
	150 pounds 14% acid phosphate=P=		21		
	22.5 pounds 20% manure salt=K=			4.5	
1[2]	103.8 pounds 13% blood=1½N=	13.5			34.7
	225 pounds 14% acid phosphate=1½P=		31.5		
	33.7 pounds 20% manure salt=1½K=			6.7	

Continued.

IN 1903, '04 '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $5 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
10[2]	22.8	34.3	1670	2965	3180	1835	2413	17.8	911	$16.10	$ 3.36	$ 12.74	$ 9.10
8[3]	31.1	39.0	1880	2725	5038	2730	3094	27.25	1713	25.93	5.04	20.89	14.03
9[3]	29.3	34.3	1840	2865	3370	2360	2609	23.0	1308	21.33	6.72	14.61	9.38
10[3]	33.2	41.3	2415	3290	4793	3075	3394	29.4	2173	29.27	8.40	20.87	12.18
14[3]	0.3	8.9	1740	900	548	430	902	.....	.....	.....	.....	.....	.....

IN 1905 AND 1907.

	1907				1905	1907							
18	19.9	31.1	.....	.....	2395	2005	2200	.....	.....	.....	.....	.....	.....
20	24.3	36.5	.....	.....	3340	2655	2998	5.35	798	6.94	1.68	5.26	2.07
(4+11)	9.4	15.8	.....	.....	1822	1349	1585	.....	.....	.....	.....	.....	.....
8	27.6	37.7	.....	.....	2640	3135	2888	21.93	1302	20.56	3.36	17.20	11.99
1[2]	32.3	33.5	.....	.....	1780	3115	2448	19.15	1163	18.06	5.04	13.02	8.37

TABLE V—

RESULTS IN FIELD A

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1905
2[2]	138.4 pounds 13% blood=2N=	18					
	300 pounds 14% acid phosphate=2P=		42				31.3
	45 pounds 20% manure salt=2K=			9			
3[2]	207.6 pounds 13% blood=3N=	27					
	450 pounds 14% acid phosphate=3P=		63				50.0
	67.5 pounds 20% manure salt=3K=			13.5			
4[2]	Unfertilized=0=						17.2

RESULTS IN

1[2]	34.6 pounds 13% blood=½N=	4.5					
	75 pounds 14% acid phosphate=½P=		10.5				
	11.2 pounds 20% manure salt=½K=			2.2			
8	Unfertilized=0=						
6	69.2 pounds 13% blood=N=	9					
	150 pounds 14% acid phosphate=P=		21				
	22.5 pounds 20% manure salt=K=			4.5			
2[2]	103.8 pounds 13% blood=1½N=	13.5					
	225 pounds 14% acid phosphate=1½P=		31.5				
	33.7 pounds 20% manure salt=1½K=			6.7			
3[2]	138.4 pounds 13% blood=2N=	18					
	300 pounds 14% acid phosphate=2P=		42				
	45 pounds 20% manure salt=2K=			9			
8[2]	Unfertilized=0=						

Continued.

IN 1905 AND 1907

Number of Plat	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fert.
	1907	Ave.	1903	1901	1905	1907	Ave.						
2[2]	28.4	29.9	.....	.....	1800	3180	2490	15.5	1205	$15.67	$ 6.72	$ 8.95	$ 4.13
3[2]	31.3	40.7	.....	.....	2600	3685	3143	26.2	1858	25.77	10.08	15.69	8.26
4[2]	11.5	14.5	.....	.....	1100	1470	1285	.....	.....	.....	.....	.....	.....

FIELD C IN 1909.

	1909					1909							
1[2]	25.0	25.0	.....	.....	.....	1940	1940	13.7	810	12.83	1.68	11.15	7.91
8	20.0	20.0	.....	.....	.....	1670	1670	.....	.....	.....	.....	.....	.....
6	38.7	38.7	.....	.....	.....	2902	2902	18.7	1232	18.02	3.36	14.66	9.73
2[2]	32.7	32.7	.....	.....	.....	2452	2452	21.4	1322	20.27	5.04	15.23	9.94
3[2]	33.6	33.6	.....	.....	.....	2270	2270	22.3	1140	20.17	6.72	13.45	8.89
8[2]	11.3	11.3	.....	.....	.....	1130	1130	.....	.....	.....	.....	.....	.....

TABLE V—

AVERAGE RESULTS FOR SEVEN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
(5^3+14^3)-18-8^2	Unfertilized=.....O=						
7^3-20-12^2	34.6 pounds 13% blood=.....½N=	4.5					
	75 pounds 14% acid phosphate=.....½P=		10.5				
	11.2 pounds 20% manure salt=.....½K=			2.2			
(5^2+14^2)-(4+11)-8	Unfertilized=.....O=						
10^2-8-6	69.2 pounds 13% blood=.....N=	9					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
(5^3+14^3)-4^2-8^2	Unfertilized=.....O=						
8^3-12^2-2^2	103.8 pounds 13% blood=.....1½N=	13.5					
	225 pounds 14% acid phosphate=.....1½P=		31.5				
	33.7 pounds 20% manure salt=.....1½K=			6.7			
(5^3+14^3)-4^2-8^2	Unfertilized=.....O=						
9^3-2^2-3^2	138.4 pounds 13% blood=.....2N=	18					
	360 pounds 14% acid phosphate=.....2P=		42				
	45 pounds 20% manure salt=.....2K=			9			

The check for plat 8, Field A, has been obtained from plats 4 and 11, that for plat 10^2, Field B, from plats 5^2 and 14^2, and for plats 7^3, 8^3, 9^3 and 10^3, Field B, from plats 5^3 and 14^3. It has been assumed that there is a

EFFECT OF VARYING QUANTITIES OF FERTILIZER ON YIELDS.

The tests in Table V were arranged to show the effect of increasing and decreasing the normal fertilizer application on yields, the normal (N P K) being 300 pounds of a mixture containing 7 per cent phosphoric acid, 3 per cent nitrogen and 1½ per cent potash. The applications were at the rate of 150 pounds per acre (½ N P K); 300 pounds per acre (N P K); 450 pounds per acre (1½ N P K); 600 pounds per acre (2 N P K); 750 pounds per acre (2½ N P K). The results in all the fields show increased yields and profits for all the quantities of fertilizer. The amount of fertilizer varied from

Continued.

YEARS ON FIELDS A, B, AND C.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
(5^3+14^3) $18\text{-}8^2$	.....	18.6	.....	.....	.....	.....	1624	.....	.....	.....	.....	.....	.....
$7^3\text{-}20\text{-}12$	.....	26.1	.....	.....	.....	.....	2223	8.6	599	$ 8.42	$ 1.68	$ 6.74	$ 4.34
(5^2+14^2)- $(4+11)\text{-}8$	.....	16.8	.....	.....	.....	.....	1549	.....	.....	.....	.....	.....	.....
$10^2\text{-}8\text{-}6$	.....	35.9	.....	.....	.....	.....	2308	19.1	1069	17.65	3.36	14.29	10.01
(5^3+14^3)- $4^2\text{-}8^2$	.....	13.4	.....	.....	.....	.....	1318	.....	.....	.....	.....	.....	.....
$8^3\text{-}12\text{-}2^2$	.....	36.5	.....	.....	.....	.....	2817	24.1	1499	22.86	5.04	17.82	11.82
(5^3+14^3)- $4^2\text{-}8^2$	.....	13.0	.....	.....	.....	.....	1272	.....	.....	.....	.....	.....	.....
$9^3\text{-}2^2\text{-}3^2$	.....	32.9	.....	.....	.....	.....	2526	20.8	1254	19.55	6.72	12.83	7.81

uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

150 to 900 pounds per acre. During the four years in Field B the largest profit was from the 450 pound application of fertilizer, the average yield being 39 bushels per acre, at a profit of $14.03 over cost of fertilizer on basis of corn alone, or $20.89 on basis of corn and stover. In this field 750 pounds of fertilizer per acre gave an average yield of 41.3 bushels corn per acre, at a profit of $12.18 over cost of fertilizer for corn alone. During two years in Field A 300 pounds of fertilizer gave the largest profit, the yield of corn being 37.7 bushels per acre, while in one year in Field C the largest increase in yield and profit was from 450 pounds of fertilizer per acre.

Concisely, the average results for seven years' experiments with varying quantities of fertilizer are as follows:

Pounds Fertilizer Per Acre.	Average Yield Per Acre.		Average Increase Over Unfertilized Plats Per Acre.		Average Value of Increase Over Cost of Fertilizer.	
	Corn, Bushels.	Stover, Pounds.	Corn, Bushels.	Stover, Pounds.	Corn and Stover.	Corn.
150	26.1	2,223	8.6	509	$ 6.74	$ 4.34
300	35.9	2,308	18.1	1,069	14.29	10.01
450	36.5	2,817	24.1	1,499	17.82	11.82
600	32.9	2,526	20.8	1,254	12.83	7.81
750[1]	41.3	3,394	29.1	2,173	20.87	12.18
900[2]	40.7	3,143	26.2	1,858	15.69	8.26

[1] Average for four years.
[2] Average for seven years. The other results are averages for seven years.

TABLE VI—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON NITROGEN AND TIME

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
11[3]	34.6 pounds 13% blood at planting=..... 30.4 pounds 14.8% nitrate of soda about July 1st=..... 150 pounds 14% acid phosphate=..... 22.5 pounds 20% manure salt=.....	½N= 4.5 ½N= 4.5 P= ..... 21 ..... K= 4.5			28.1	31.3	35
12[3]	30.4 pounds 14.8% nitrate of soda at planting= 30.4 pounds 14.8% nitrate of soda about July 1st=..... 150 pounds 14% acid phosphate=..... 22.5 pounds 20% manure salt=.....	½N= 4.5 ½N= 4.5 P= ..... 21 ..... K= 4.5			27.3	32.3	32.7
13[3]	34.6 pounds 13% blood at planting=..... 54.6 pounds 13% blood about July 1st=..... 150 pounds 14% acid phosphate=..... 22.5 pounds 20% manure salt=.....	½N= 4.5 ½N= 4.5 P= ..... 21 ..... K= 4.5			25.1	28.8	32.7
14[3]	Unfertilized=.....	O=			25.8	6.0	3.5

In addition to the yields and profits from different quantities of fertilizer, the results indicate that where the larger amounts have been used the land is in better condition than it was at the beginning, as the yields in later years were larger than at first.

IREDELL TEST FARM; EFFECTS OF DIFFERENT MATERIALS FURNISHING OF APPLICATION.

IN 1903, '04, '05, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fert.
	1908	Ave.	1903	1904	1905	1908	Ave.						
11[3]	20.1	28.6	1500	2260	2818	2180	2190	18.29	1049	$17.00	$ 3.08	$ 13.92	$ 9.72
12[3]	20.1	28.0	1600	2590	2553	2080	2206	18.25	1144	17.34	2.80	14.54	9.98
13[3]	19.3	26.5	1590	2220	2635	1990	2109	17.1	1127	16.48	3.36	13.12	8.61
14[3]	0.3	8.9	1740	900	548	430	905	.....	.....	.....	.....	.....	.....

TABLE VI—

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
5[3]	55.4 pounds 13% blood applied at planting=4-5 N=	7.2					
	12.2 pounds 14.8% nitrate of soda applied at planting=1-5 N=	1.8					
	150 pounds 14% acid phosphate=P=		21		25.2	28.8	32.9
	22.5 pounds 20% manure salt=K=			4.5			

RESULTS IN FIELD

							1905
4[2]	Unfertilized=O=						17.2
5[2]	34.6 pounds 13% blood applied at planting=½N=	4.5					
	30.4 pounds 14.8% nitrate of soda applied about July 1st=½N=	4.5					
	150 pounds 14% acid phosphate=P=		21				39.7
	22.5 pounds 20% manure salt=K=			4.5			
6[2]	30.4 pounds 14.8% nitrate of soda applied at planting=½N=	4.5					
	30.4 pounds 14.8% nitrate of soda applied about July 1st=½N=	4.5					
	150 pounds 14% acid phosphate=P=		21				42.0
	22.5 pounds 20% manure salt=K=			4.5			
7[2]	34.6 pounds 13% blood applied at planting=½N=	4.5					
	34.6 pounds 13% blood applied about July 1st=½N=	4.5					
	150 pounds 14% acid phosphate=P=		21				40.3
	22.5 pounds 20% manure salt=K=			4.5			
8[2]	55.4 pounds 13% blood applied at planting=4-5 N=	7.2					
	12.2 pounds 14.8% nitrate of soda applied at planting=1-5 N=	1.8					
	150 pounds 14% acid phosphate=P=		21				39.7
	22.5 pounds 20% manure salt=K=			4.5			
11[2]	Unfertilized=O=						18.0

Continued.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
15[1]	21.5	27.1	1550	2120	2570	2230	2118	18.2	1213	$17.59	$ 3.25	$ 14.34	$ 9.49

A IN 1905 AND 1907.

	1907				1905	1907							
4[2]	11.5	14.4	.....	.....	1100	1470	1285	.....	.....	.....	.....	.....	.....
5[2]	24.3	32.0	.....	.....	2060	2355	2208	17.65	923	16.05	3.08	12.97	9.28
6[2]	25.3	33.7	.....	.....	2310	2590	2450	19.3	1165	18.17	2.80	15.37	10.71
7[2]	25.0	32.7	.....	.....	2320	2900	2610	18.3	1325	18.11	3.36	14.75	9.45
8[2]	27.7	33.7	.....	.....	2060	2930	2495	19.65	1162	18.40	3.25	15.15	10.51
11[2]	10.1	14.1	.....	.....	1250	1415	1333	.....	.....	.....	.....	.....	.....

TABLE VI—AVERAGE RESULTS FOR SIX

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
$(5^5+14^3)-4^2$	Unfertilized=.....O=						
11^3-5^2	34.6 pounds 13% blood applied at planting=.....½N=	4.5					
	30.4 pounds 14.8% nitrate of soda applied about July 1st=.....½N=	4.5					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
$(5^3+14^3)-4^2$	Unfertilized=.....O=						
12^3-6^2	30.4 pounds 14.8% nitrate of soda applied at planting=.....½N=	4.5					
	30.4 pounds 14.8% nitrate of soda applied about July 1st=.....½N=	4.5					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
$(5^2+14^3)-4^2$	Unfertilized=.....O=						
13^3-7^2	34.6 pounds 13% blood applied at planting=.....½N=	4.5					
	34.6 pounds 13% blood applied about July 1st=.....½N=	4.5					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			
14^3-11^2	Unfertilized=.....O=						
15^3-8^2	55.4 pounds 13% blood applied at planting=.....4-5 N=	7.2					
	12.2 pounds 14.8% nitrate of soda applied at planting=.....1-5 N=	1.8					
	150 pounds 14% acid phosphate=.....P=		21				
	22.5 pounds 20% manure salt=.....K=			4.5			

The check for plats 11^3, 12^3 and 13^3, Field B, have been obtained from plats 5^3 and 14^3. It has been assumed that there is a uniform increase or decrease in the natural fertility between check plats and a corrected check was figured on this basis for each treated plat between checks.

EFFECT OF DIFFERENT MATERIALS FURNISHING NITROGEN AND TIME OF APPLICATION.

The tests, the results of which are presented in Table VI, were planned to determine the comparative value of dried blood and

Continued.

YEARS IN FIELDS A AND B.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.	Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908 Ave.	1903	1904	1906	1908	Ave.						
$(5^3+14^3)-4^3$	12.24					1189						
11^3-5^3	29.73					2196	18.07	1007	$16.68	$ 3.08	$ 13.60	$ 9.57
$(5^3+14^3)-4^3$	11.74					1136						
12^3-6^3	29.9					2287	18.60	1151	17.62	2.80	14.82	10.22
$(5^3+14^3)-4^3$	11.24					1083						
13^3-7^3	28.57					2276	17.49	1193	17.01	3.36	13.65	8.88
14^3-11^3	10.6					1046						
15^3-8^3	29.3					2244	18.7	1198	17.88	3.25	14.63	9.84

nitrate of soda as nitrogen-furnishing materials in growing corn, as well as the best way to apply them.

Nitrate of soda is one of the best, if not the best, representative of quickly acting nitrogenous materials. Because of its easy solubility in water and the form of its nitrogen, it is quickly available for the use of plants. The questions usually raised in connection with its use are the possibility of its loss from the soil, especially

sandy or open, porous soil, because of its easy solubility in water, and of its giving out before a long-seasoned crop has made its growth, thus leaving the crop without a supply of nitrogen before the end of the growing season. Its use is most strongly advocated for short-season crops, as in early truck and vegetable growing and as a top dressing for grain and for corn and cotton after growth is well advanced, or for any crop when seen to be in need of a quickly-acting nitrogen-supplying material.

Dried blood, which is a fair representative of the animal and vegetable materials furnishing nitrogen, as cotton-seed meal, tankage, etc., is not soluble in water and acts more slowly and for a longer time. It must be changed by rotting or decomposing in the soil into nitrate before it can feed the crop, and is thus likely to be effective throughout a reasonable growing season.

It has become a practice in growing many crops to apply only a part of the nitrogen at the time of planting and a portion later, usually as nitrate of soda, so as to keep the crop growing as rapidly as possible.

The experiments in Table VI were planned with a view of throwing as much light as possible on these questions of nitrogen fertilization in corn growing. In the tests all of the phosphoric acid and potash were applied in the drill before planting. On two plats (11^3 and 5^2) one-half the nitrogen was supplied as dried blood and was applied with the phosphoric acid and potash before planting, the other half of the nitrogen being supplied as nitrate of soda and was applied about July first. On two other plats (12^3 and 6^2) all of the nitrogen was supplied by nitrate of soda, one-half being applied before planting with the phosphoric acid and potash, and the other

TABLE VII—RESULTS OF FERTILIZER EXPERIMENTS WITH CORN ON OF APPL

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre.		
					1903	1904	1906
(5^2–14^2)	Unfertilized=.....O=	.....	.....	.....	21.8	20.2	15.9
10^2	69.2 pounds 13% blood=.....N=	9	.....	.....			
	15 pounds 14% acid phosphate=.....P=	.....	21	.....	34.2	37.1	43.2
	22.5 pounds 20% manure salt=.....K=	.....	.....	4.5			

Fertilizer applied in drill before planting.

half about July first. On still two other plats (13[3] and 7[3]) the nitrogen was supplied by dried blood, one-half being applied before planting, with the phosphoric acid and potash, and the other half about July first. On two more plats (15[3] and 8[3]) four-fifths of the nitrogen was furnished by dried blood and one-fifth by nitrate of soda, and was all applied before planting, along with the phosphoric acid and potash. The total yields and increased yields over unfertilized plats were quite uniform on the two fields in all the years and do not show any decided advantage of either nitrogen-furnishing material over the other or any one of the methods of application over the others. The average results gave a slightly larger profit for nitrate of soda as the source of nitrogen, when two applications of nitrogen were made, one-half just before planting and the other about July first.

Taking into consideration the additional cost of making the second application of nitrogen, the best returns have come from an application of all of the fertilizer in the drill before planting and having four-fifths of the nitrogen supplied as blood and one-fifth as nitrate of soda. The additional expense of dividing the application of nitrogen and applying one-half before planting and one-half later is not justified by the experiments. It is to be borne in mind that the soil on which these tests were made is a clay loam with a good clay subsoil and the danger from loss by leaching is very slight, if any. It is quite clear from six years work on this soil with an application of 300 pounds per acre that the most economical way of applying the fertilizer is to put it all in the drill before planting the crop. The results might be different on sandy loams or sandy soils.

IREDELL TEST FARM; EFFECTS OF DIFFERENT METHODS AND TIME ICATION.

IN 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
(5[2]–14[2])	8.3	16.5	1625	1680	1750	1665	1680	----------	----------	----------	----------	----------	----------
10[2]	22.8	34.3	1670	2965	3180	1835	2413	17.8		0	$ 3.36	$ 12.74	$ 9.10

TABLE VII—

RESULTS IN FIELD B

Number of Plat.	Fertilizer Application per Acre.		Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
5[1]	Unfertilized=	O=				20.1	16.1	10.5
8[1]	69.2 pounds 13% blood=	N=	9					
	150 pounds 14% acid phosphate=	P=		21		2.95	4.10	38.3
	22.5 pounds 20% manure salt=	K=			4.5			
	The fertilizer on this plat was divided into two equal parts, ½ being applied in the drill before planting, and ½ as side dressing about July 1.							
7[1]	69.2 pounds 13% blood=	N=	9					
	150 pounds 14% acid phosphate=	P=		21		26.9	26.2	55.9
	22.5 pounds 20% manure salt=	K=			4.5			
	The fertilizer on this plat was applied broadcast before planting.							

RESULTS IN FIELD A

						1905
(4–11)	Unfertilized=	O=				22.2
8	69.2 pounds 13% blood=	N=	9			
	150 pounds 14% acid phosphate=	P=		21		47.8
	22.5 pounds 20% manure salt=	K=			4.5	
	Fertilizer applied in drill before planting.					
11[2]	Unfertilized=	O=				18.0
9[2]	69.2 pounds 13% blood=	N=	9			
	150 pounds 14% acid phosphate=	P=		21		38.3
	22.5 pounds 20% manure salt=	K=			4.5	
	The fertilizer on this plat was divided into two equal parts, ½ being applied in the drill before planting, ½ as side dressing about July 1st.					
18[2]	Unfertilized=	O=				23.6
16[2]	69.2 pounds 13% blood=	N=	9			
	150 pounds 14% acid phosphate=	P=		21		35.3
	22.5 pounds 20% manure salt=	K=			4.5	
	The fertilizer on this plat was applied broadcast before planting.					

Continued.

N 1903, '04, '06, AND '08.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $8 per Ton.	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone (not valuing Stover) over Cost of Fertilizer.
	1908	Ave.	1903	1904	1906	1908	Ave.						
5[1]	3.1	12.5	1635	1120	1240	870	1216	.....	.....				
8[1]	22.5	32.9	1790	2250	2830	1960	2208	20.4	992	$ 18.64	$ 3.36	$ 14.89	$ 10.92
7[1]	14.8	31.0	1570	1850	3955	2020	2349	18.5	1133	17.55	3.36	14.12	9.59

IN 1905 AND 1907.

	1907				1906	1907							
(4-11)	9.4	15.8	.....	.....	1822	1349	1585	.....	.....	.....	.....	.....	.....
8	27.6	37.7	.....	.....	2640	3135	2888	21.93	1302	20.56	3.36	17.20	11.99
11[2]	10.1	14.1	.....	.....	1250	1415	1333	.....	.....	.....	.....	.....	.....
9[2]	29.5	33.9	.....	.....	2550	2905	2728	19.8	1395	19.44	3.36	16.08	10.50
18[2]	11.7	17.7	.....	.....	1540	1355	1448	.....	.....	.....	.....	.....	.....
16[2]	24.3	29.8	.....	.....	2240	2805	2523	12.1	1075	12.77	3.36	9.41	5.11

TABLE VII—RESULTS IN

Number of Plat.	Fertilizer Application per Acre.	Pounds of Nitrogen (N) per Acre.	Pounds of Phosphoric Acid (P_2O_5) per Acre.	Pounds of Potash (K_2O) per Acre.	Yield in Bushels of Shelled Corn per Acre. 1903	1904	1906
8	Unfertilized=O=						
6	69.2 pounds 13% blood=N= / 150 pounds 14% acid phosphate=P= / 22.5 pounds 20% manure salt=K=	9	21	4.5			
	Fertilizer applied in drill before planting.						
8^2	Unfertilized=O=						
6^2	69.2 pounds 13% blood=N= / 150 pounds 14% acid phosphate=P= / 22.5 pounds 20% manure salt=K=	9	21	4.5			
	The fertilizer on this plat was applied broadcast before planting.						

AVERAGE RESULTS FOR SEVEN

$(5^2+14^2)-(4+11)-8$	Unfertilized=O=						
10^2-8-6	69.2 pounds 13% blood=N= / 150 pounds 14% acid phosphate=P= / 22.5 pounds 20% manure salt=K=	9	21	4.5			
	Fertilizer applied in drill before planting.						
5^4-11^2	Unfertilized=O=						
8^4-9^2	69.2 pounds 13% blood=N= / 150 pounds 14% acid phosphate=P= / 22.5 pounds 20% manure salt=K=	9	21	4.5			
	The fertilizer on these plats was divided into two equal parts, $\frac{1}{2}$ being applied in the drill before planting and $\frac{1}{2}$ as side dressing about July 1st.						
5^4-18^2	Unfertilized=O=						
7^4-16^2	69.2 pounds 13% blood=N= / 150 pounds 14% acid phosphate=P= / 22.5 pounds 20% manure salt=K=	9	21	4.5			
	The fertilizer on these plats was applied broadcast before planting.						

The check for plat 8, Field A, has been obtained from plats 4 and 11, and that for plat 10^2, Field B, from p a [illegible] 14^2. It has been assumed that there is a uniform increase or decrease in the natural fertility between check plats, and a corrected check was figured on this basis for each treated plat between checks.

Continued.

FIELD C IN 1909.

Number of Plat.	Yield in Bushels of Shelled Corn per Acre.		Yield of Stover in Pounds per Acre.					Average Increase in Bushels of Shelled Corn per Acre due to Fertilizer.	Average Increase in Lbs. of Stover per Acre due to Fertilizer.	Value of Increase with Corn at $.70 per Bushel and Stover at $5 per Ton	Cost of Fertilizer per Acre.	Value of Average Annual Increase of Corn and Stover over Cost of Fertilizer.	Value of Average Annual Increase of Corn alone but Valuing Stover over Cost of Fertilizer
	1909	Ave.	1903	1904	1905	1909	Ave.						
8	20.0	20.0	.....	.....	.....	1670	1670	.....	.....	.....	.....	.....	.....
6	38.7	38.7	.....	.....	.....	2902	2902	18.7	1232	$18.02	$ 3.36	$ 14.66	$ 9.73
8[2]	11.3	11.3	.....	.....	.....	1130	1130	.....	.....	.....	.....	.....	.....
6[2]	24.8	24.8	.....	.....	.....	2650	2650	12.5	2600	19.15	3.36	15.79	5.39

YEARS IN FIELD A, B, AND C.

(5[2]+14[2])(4+11)-8	.....	16.8	.....	.....	.....	1549	.....	.....	.....	.....	.....	.....	.....
10[2]-8-6	.....	35.9	.....	.....	.....	2308	19.1	1069	17.65	3.36	14.29	10.01	
5[4]-11[2]	.....	12.98	.....	.....	.....	1235	.....	.....	.....	.....	.....	.....	
8[4]-9[2]*	.....	33.2	.....	.....	.....	2381	20.2	1126	18.66	3.36	15 30	10.79	
5[4]-18[2]	.....	14.2	.....	.....	.....	1293	.....	.....	.....	.....	.....	.....	.....
7[4]-16[2]	.....	30.6	.....	.....	.....	2407	16.4	1114	15.94	3.36	12.58	8.1	

EFFECT OF DIFFERENT METHODS AND TIME OF APPLICATION OF FERTILIZER.

The results presented in Table VII were obtained from tests planned to show the effect on the yield of corn and stover from applying—

(a) All the fertilizer in the drill before planting;

(b) Dividing the fertilizer into two equal parts, applying one-half in the drill before planting, and the other half as a side dressing about July first; and

(c) From applying all the fertilizer broadcast before planting, the quantity of fertilizer and the materials entering into it being the same in all three cases.

Taking the results as a whole, the increased yields and profits show that it has made very little difference whether all of the fertilizer was applied in the drill before planting, or whether it was divided into two equal parts and one-half put in the drill before planting and the other half as a side dressing around July first, according to season. The average yield and profit from the broadcast application of fertilizer were 22 per cent less than was produced by the same quantity of fertilizer when applied in either of the two ways given above. The amount of fertilizer used in the test was 300 pounds, and it is quite clear that the best and most economical way of using this amount of fertilizer per acre is in the drill before planting the crop. Larger quantities might give as good or better results broadcast or when applied at different times, and on a different character of soil the results might be different.

II. VARIETIES, CULTURE, AND FERTILIZATION OF CORN ON PIEDMONT RED CLAY LOAM, RED CLAY AND VALLEY SOILS.

Experiments have been conducted for seven years with the varieties of corn on the red clay loam soil of the Iredell Test Farm. These results have been given in detail in this BULLETIN. On basis of these results and other information which we have, the suggestions below are given for the culture and fertilization of corn on the red clay loams, red clays, and valley soils of the Piedmont and the varieties of corn which are best suited to them.

Corn is an exhaustive crop on the soil, especially so when the stover is also removed. On basis of present prices of fertilizer one bushel of corn removes from the soil about 23 cents worth of plant food. It would cost this much to return the plant food in a bushel of corn to the soil in a commercial fertilizer. A fifty-bushel crop of corn has, therefore, removed plant food to the value of between $11.00 and $12.00. By good fertilization we have produced good yields, and increases over unfertilized areas have been obtained and at a cost of 22.4 cents per bushel, which is practically the same as the plant food in a bushel of corn.

Preparation and Cultivation.—Corn delights in a thoroughly well prepared soil. The land should be broken in the fall or early spring to a depth of 6 or 8 inches and the soil may be gradually deepened beyond this to advantage. Before planting cut up the land with a disk harrow to get rid of clods and to make a good seed bed. 4 feet is a good width for rows. The distance the corn is left in the row would depend on the productiveness of the land and should vary, usually, between 15 and 30 inches. The fertilizer on these soils should, as a rule, be put in the drill before planting and the corn planted just below the level. Weeders and light harrows may be run across the rows two or three times before and after the corn is up and before cultivation with cultivators begins. Cultivate with good one or two-horse cultivators, which will not require more than two furrows at the greatest to the row, every ten days or two weeks, and as nearly as possible after rains to keep down grass and weeds and to conserve the supply of moisture. The cultivation should be comparatively deep early in the season, becoming shallow as the crop grows larger and its root system develops. It has been found desirable to continue the cultivation in this way until the corn is in silk and tassel, making the cultivation very shallow at last and going away some distance from the corn.

Varieties.—In the seven years' work on the Iredell Farm a very large number of varieties of corn of practically all the types gen-

erally grown have been tested. Those giving the best results are the ones belonging to the prolific or two or more ears to-the-stalk kind. Among these, Weekley's Improved, Cocke's Prolific and Biggs' Seven-Ear have done specially well. The results of variety tests have been published each year in detail and the results are summarized in the FEBRUARY (1909) BULLETIN. These results can be had for study by any one specially interested in them.

Fertilization.—Analysis of these soils show that they are very low in phosphoric acid, high in potash, and have a fair supply of lime, the quantity of nitrogen depending on the amount of vegetable or organic matter in the soil. Experiments show that phosphoric acid is the most needed single constituent for the production of corn on these lands; nitrogen coming next and being very essential, while potash is of but little importance. It is likely not possible with present results to say just what is the best proportion of these constituents for most profitable returns, but it is certain that the fertilizer should carry a high percentage of phosphoric acid and nitrogen, and a low percentage of potash. Indications are that a mixture containing 10 per cent available phosphoric acid, 5 per cent nitrogen and 1½ per cent potash will give close to if not the best returns. Six per cent of nitrogen is not too much on lands which have been grown continuously, or practically so, in cotton, corn and small grain. Five per cent nitrogen is equal to 6.08 per cent ammonia. This mixture can be used at the rate of 300 to 500 pounds per acre with good returns and profits. Larger quantities can be used with good results, but the profits, on basis of fertilizer used, will not be proportionately so large.

The nitrogen may be all derived from blood, tankage, cotton-seed meal or similar products, or in part from one or all of these and in part from nitrate of soda or sulphate or ammonia. Nitrate of soda may be used as the entire source of nitrogen when divided into two parts.

Kainit, manure salt, sulphate or muriate of potash may furnish the potash, and acid phosphate the phosphoric acid.

Three hundred pounds of the above mixture would contain thirty pounds of available phosphoric acid, 4½ pounds potash, and 15 pounds nitrogen; and 500 pounds would contain 50 pounds available phosphoric acid, 7½ pounds potash and 25 pounds nitrogen. The required amounts of phosphoric acid in 300 and 500 pounds respectively of this mixture would be supplied by 214.3 pounds and 357.1 pounds of 14 per cent acid phosphate; the nitrogen by 115.4 pounds and 192.3 pounds of 13 per cent dried blood, and the potash by 22.5 pounds and 37.5 pounds of manure salt. Other materials or other grades of these materials may be used, and it will not be difficult, knowing just what they contain, to use such quantities of them

as may be necessary to furnish the desired quantities of plant food, having in mind that it is the specific number of pounds of phosphoric acid, nitrogen and potash that is desired rather than a given weight of mixed fertilizer.

It is not more, but perhaps less difficult to calculate the number of pounds of nitrogen, phosphoric acid and potash to be applied per acre to any given crop from materials which are to be had than to estimate the exact number of pounds of the materials to make a formula of a certain composition, as for example, in an 8-2-2 goods. The question of filler does not have to be considered in doing this, as is necessary in making a fertilizer formula in the usual way. When it is desired, for instance, to apply the equivalent of 500 pounds per acre of a fertilizer mixture containing 10 per cent available phosphoric acid, 1½ per cent potash, and 5 per cent nitrogen, or 50 pounds phosphoric acid, 7½ pounds potash and 25 pounds of nitrogen, it is only necessary to divide the number of pounds of plant food desired per acre (50, 7½ and 25) by the percentage composition of the materials to be used as follows:

Number of Pounds of Plant Food per Acre Wanted.	:	Percentage Composition of the Materials to be Used.	=	Number of Pounds of Fertilizer Materials per Acre to Apply.
Phosphoric Acid.....50 Lbs.	:	14 Per Cent Acid Phosphate..	=	357.1 Pounds.
Nitrogen.....25 Lbs.	:	13 Per Cent Dried Blood.....	=	192.3 Pounds.
Potash..... 7.5 Lbs.	:	20 Per Cent Manure Salt.....	=	37.5 Pounds.

The best and most economical way to apply the fertilizer in the quantities recommended here is in the drill before planting, though there is no objection to dividing the application into two equal parts, putting one-half in the drill before planting and applying the other half as a side dressing around July first according to season and growth of crop. The fertilizer in the quantity here suggested should not be applied broadcast.

TEST FARM BULLETINS.

(Being Bulletins giving results of Experiments on the Test Farms.)

NOVEMBER, 1900. Fertilizer, Culture, and Variety Tests of Cotton, Corn, Irish and Sweet Potatoes, Grains and Grasses, on Edgecombe and Red Springs Farms.

JANUARY, 1902. Fertilizer, Culture, and Variety Tests of Cotton and Corn; Experiments on Black or Pocosin Soil; Fertilizers for Corn and Cotton; Composts and Composting.

FEBRUARY, 1903. Variety and Distance Tests of Corn and Cotton on Edgecombe and Red Springs Farms; Fertilizers for Corn, Cotton, and Tobacco.

SEPTEMBER, 1903. Improvement of Corn by Seed Selection.

FEBRUARY, 1904. Variety and Distance Tests of Corn and Cotton on Edgecombe, Red Springs, and Iredell Farms; Fertilizers for Corn, Cotton and Tobacco.

JULY, 1904. Hairy Vetch and Bur Clover.

FEBRUARY, 1905. Variety and Distance Tests of Corn and Cotton on Edgecombe, Iredell, and Transylvania Test Farms; Fertilizers for Corn, Cotton, and Tobacco.

FEBRUARY, 1906. Variety and Distance Tests of Corn and Cotton; Fertilizers for Corn, Cotton, and Tobacco.

JUNE, 1906. Alfalfa Growing.

AUGUST, 1906. Selecting Seed Corn for Larger Yields.

SEPTEMBER, 1906. The Cotton Plant.

JANUARY, 1907. Fertilizer Experiments on Corn and Cotton with Nitrate of Soda, Peruvian Guano, Phosphate Rock, and Basic Slag.

FEBRUARY, 1907. Variety and Distance Tests of Corn and Cotton on Edgecombe, Iredell, and Transylvania Test Farms.

SEPTEMBER, 1907. Lettuce Growing in North Carolina.

FEBRUARY, 1908. Variety and Distance Tests of Corn and Cotton on Edgecombe, Iredell, and Buncombe Test Farms.

FEBRUARY, 1909. Variety and Distance Tests of Corn and Cotton; Fertilizers for Corn, Cotton, and Tobacco.

MARCH, 1909. Peanut Culture.

AUGUST, 1909. Varieties, Culture, and Fertilization of Small Grain.

FEBRUARY, 1910. Variety Tests of Corn and Cotton.

JUNE, 1910. The Culture of the Cowpea; Variety and Fertiilzer Tests on Piedmont Red Clay Loam Soil of the Iredell Test Farm.

AUGUST, 1910. Variety and Fertilizer Tests of Cotton on Piedmont Red Clay Loam Soil of the Iredell Test Farm.

Supplement to September Bulletin, 1910

North Carolina Department of Agriculture

OIL BULLETIN

Inspection of Illuminating Oils

BY

L. B. LOCKHART

State Oil Chemist.

SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER

STATE BOARD OF AGRICULTURE

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Melville	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

DIVISION OF OIL INSPECTION

W. A. Graham	Commissioner.
Elias Carr	Secretary.
L. B. Lockhart	State Oil Chemist.
Manlius Orr	Assistant Oil Chemist.
George Little	Oil Clerk.

Raleigh, N. C., September 30th, 1910.

Sir:

I submit herewith manuscript covering the results of inspection and investigation of illuminating oils since December 1st, 1909. I recommend its publication as a supplement to the September Bulletin of the Department of Agriculture.

Respectfully submitted,

L. B. Lockhart,
State Oil Chemist.

To Hon. W. A. Graham,
Commissioner of Agriculture.

INSPECTION OF ILLUMINATING OILS.

INTRODUCTION.

The Division of Oil Inspection was organized by the Board of Agriculture in June, 1909, for the purpose of carrying out an act (ch. 554, Laws 1909) of the General Assembly providing for the inspection of illuminating oils and fluids. Owing to a restraining order of the United States Circuit Court the act was not in full effect until Oct. 20th, 1909.

The only standards for illuminating oils in this State are the flash test and the distillation test for amount of residue. The latter test went into effect Sept. 1st, 1910, for oil brought into the State, and will be in effect for all oils after Dec. 1st, 1910.

The results of inspection to Dec. 1st, 1909, were given in the December Bulletin for 1909.

CHANGES IN THE OIL TRADE.

Since July 1st, 1909, the number of oil companies doing business in the State has greatly increased. Nineteen companies are now registered with the Department, and the price of oil to the retailer has dropped nearly three cents per gallon in consequence of competition. Under the State Anti-Trust Law, this drop in price extends to points in the State where there is no direct competition.

The production of petroleum, from which kerosene is distilled, has greatly increased in the middle West. In 1900 the Pennsylvania group of States produced 83 per cent of the petroleum in the United States. In 1908, the Pennsylvania group had dropped to 17 per cent, while California, Illinois and Oklahoma, which were practically unknown as oil producers in 1900, in 1908 produced 69 per cent of the petroleum. The petroleum and refined oil from the new fields is of different character from the oil from other fields.

SAFETY.

The flash test is a safety test. The present requirement of not less than 100 degrees Fahr. flash with the Elliott cup is the best test consistent with a high degree of safety and good illuminating quality. Under the strict enforcement of this provision of the law, the kerosene now sold in the State is reasonably safe under ordinary conditions of use. Care, however, should be exercised in its use as with other inflammable materials.

The flash test has generally been met by the Oil Companies. This test went into effect Oct. 20th, 1909, with the following result:

Samples tested.	Received.	Number below 100° Flash.	Per Cent below 100° Flash.
267	Before October 20, 1909	68	25.5
810	From October 20, 1909, to February 10, 1910	29	3.6
493	From February 10, 1910, to April 4, 1910	1	.2

STANDARD FOR QUALITY.

The requirement for quality of oils used for general illuminating purposes is "not more than 6 per cent by weight of residue remaining undistilled at 570° Fahr." The enforcement of this standard will prevent the sale of most of the really bad oils. Rigid inspection has already eliminated some of the lower grade oils.

Consumers of oil and retailers should remember that there will continue to be various grades of oil sold by the same company. The highest grades are usually worth the extra cost.

Numerous complaints had been made to this Department regarding inferior oils. Many of these complaints could be traced to the nature and care of the lamps used, and some to the careless handling of oils by wholesale and retail dealers. Others were found to be due to the methods of the manufacturer or refiner.

In the laboratory of the Oil Division many samples have been distilled and the luminosity determined under similar conditions, using a No. 1 "Model" burner with a flat wick (American). A comparison of 58 oils was made after classifying on the basis of 6 per cent residue:

Residue at 570° F.	Less than 6%	More than 6%
Number of oils tested	20	38
Candle Power (after ½ hour)	7.91	7.62
Candle Power (after 7½ hours)	7.10	6.23
Drop in Candle Power (per cent)	10.2	18.6
Viscosity (Engler-Ubbelohde)	1.11	1.17

Notwithstanding the fact that the initial candle power was 3.6 per cent less, and more oil was left in the lamp, the actual and percentage drop was much greater for the high-residue oils. Of the 20 low-residue oils only one gave as much as 15 per cent drop. Of the 38 high-residue oils 58 per cent gave more than 15 per cent drop in the seven hours.

The oil immediately above 570 degrees Fahr. is a thin lubricating oil unsuitable for burning in lamps of ordinary construction. The

residue, and impurities associated with it, not only increase the viscosity but cause a cumulative clogging of the wick resulting in constantly decreasing luminosity. The residue increases the tendency to smoke and to deposit a crust of carbon. Subsequent use of a high grade oil with the same wick will be unsatisfactory.

The residue test is intended to take the place of the old gravity test. With the recent development of new oil fields of varying character, the gravity test is now hardly applicable. The gravity and other physical characteristics of the crude petroleum and of the kerosene from the different fields vary widely.

The 6 per cent residue standard will be easy to meet as the refiners can break the distillation readily at the necessary point, using the usual gravity control. Oils well within the residue limit may be examined by determining the viscosity. There is a close relation between the amount of heavy oils or residue and the viscosity.

It is estimated that about 9 per cent of the oils sold in the State will be affected. Oils made of excessive amounts of "tops and bottoms" will be excluded. The increased cost of the oil concerned will be less than $\frac{1}{4}$ cent per gallon. The price and quality of the better grades of oil will be unaffected. This increase is very small in comparison with the increase in quality, and in comparison with the freight on oils, which will average almost 3 cents per gallon throughout the State.

Kerosene varies so widely in illuminating value and may be so deceptive in appearance that some definite regulation is necessary for the protection of the public. The standards should be so devised as to hamper the trade as little as possible and permit the sale of all reasonably high grade products. The ideal is a maximum of safety and protection for the consumer with a minimum of restriction to the trade.

CARE OF LAMPS.

Poor lights are often caused by the condition of lamps and wicks. The heavy oils which accumulate in the lamp should be thrown out every month and the lamp thoroughly cleaned.

Do not put water into the lamp.

The lamp should be filled and the charred portion of the wick removed each time before lighting.

Use a wick of good quality such as American, Fletcher or Woodberry wick. The wick is the vital part of the lamp.

New wicks should be supplied every month or two. They should be dried before the fire and put into the oil while still warm. Used wicks should be similarly dried every two weeks. Wicks gradually clog. Clogged wicks make poor lights. Don't economize on wicks. They are cheaper than oil or eyesight.

A smoky flame may be due to a cheap burner or an unsuitable

chimney. Burner and chimney should be kept clean. Burners may be cleaned by boiling with water to which a little soda has been added.

If these directions are followed, particularly those with regard to wicks, there will be less complaint of oil and lights.

DEALER'S TANKS.

Tanks should be cleared of dirt and trash at least twice each year. It is to the interest of the consumer, dealer and manufacturer to see that the dealer's tanks are kept clean. Kerosene dissolves various substances with which it comes into contact. These dissolved substances clog the wick. The best oil, if exposed to the impurities so often found in tanks and barrels, will give an unsatisfactory light. Poor lights may often be traced to the lack of care in handling oil.

Consumers should not patronize a dealer who sells dirty oil or keeps a filthy oil tank.

FRAUDULENT POWDERS.

The attention of the Department has been called to several "Anti-Explosion" and "Illuminating" Powders sold throughout the State by irresponsible agents. These powders do not increase either the safety or the illuminating value of the oil and may do positive harm by clogging the wick.

QUALITY OF KEROSENE.

In judging the quality of a sample of kerosene of satisfactory flash point, the following facts should be considered:

It should be water white in color and otherwise well refined.

It should show a very large per cent of low boiling point oil, below 250° C.

The distillate above 275° C. should be small.

The residue at 300° C. (572° Fahr.) should usually be less than 5 per cent.

The specific gravity should be below .810 (that is, above 43 degrees Baume).

The viscosity should be less than 1.16.

Photometric tests should show a steady flame of good quality and good illuminating power. The illuminating power of the best oils does not drop more than 12 per cent in a burning test of 6 to 8 hours.

The various tests should be taken together in order to get a fair estimate of the sample.

METHODS OF ANALYSIS.

The continuous distillation of 100 cc. of oil was carried out in an Engler flask electrically heated to give two drops of distillate per second. The flask was protected by asbestos and no correction was made for the thermometer stem. Repeated comparisons have shown that the results are substantially the same as with the present legal method in which the temperature correction is required.

The viscosity was taken at 68° F. with an Engler-Ubbelohde viscosimeter standardized by the German Reichsanstalt.

The photometric method was similar to that recommended by the International Committee. Glass lamps were used. The reservoirs were cylindrical with flat bottoms and held about 325 cc. The initial oil level was 6 cm. below the top of the wick tube and the drop in oil level was usually about 40 mm. (1.6 in.) during the total burning period of 7½ hours. A No. 1 "Model" burner and Macbeth chimney No. 502 were used. New American wicks, recently dried for one hour at 110° C. were used each time. The lamps were allowed to stand over night after filling and trimming.

The illuminating power was determined after burning ½ hour and again 7 hours later. During the first ¼ hour after lighting the flames were turned up to the highest safe limit and were not again disturbed. The oil was kept at a constant temperature of 80° to 85° F. by immersing in running water. Usually about 40 cc. of oil remained in the lamp at the last measurement. The measurements were made with a Reichsanstalt photometer using a standardized Hefner lamp. The Hefner unit was taken as equal to .90 candle power and never varied more than 0.5 per cent on account of humidity. Each reading was made five times. Many of the photometric tests were made in duplicate.

OILS TESTED.

The oils analyzed were chosen on account of some special feature, such as marked color, high or low viscosity, high specific gravity, etc., or, as in a number of cases, simply to get a sample of as many brands as possible.

Of the samples shown in the following tables, only 17 per cent of those passing the flash test gave any distillate below 150° C.

Seven oils gave less than 15 per cent distillate below 200° C: No. 937 (9.1 per cent); 1189 (6.1 per cent); 1396 (12.8 per cent); 1766 (4.1 per cent); 1803 (12.3 per cent); 2161 (8.5 per cent); 2478 (0.5 per cent). Six others (Nos. 611, 1515, 1749, 1763, 1765 and 1975) gave from 15 per cent to 19 per cent distillate below 200° C.

Eight oils gave more than 40 per cent distillate below 200° C: No. 53 (40.5 per cent); 432 (40.2 per cent); 953 (41.5 per cent); 1483 (41.4 per cent); 1815 (51.0 per cent); 1945 (40.3 per cent); 2526 (47.5 per cent); 2599 (42.0 per cent).

ANALYSES OF

Laboratory Number.	Name of Oil.	Name of Oil Company.	Sold by	Date Sampled.
63	Garnet Red	Red "C" Oil Mfg. Co.	R. J. Rivenbark, Goldsboro	July 8, 1909
110	Red "C"	Red "C" Oil Mfg. Co.	C. Y. Holding, Wake Forest	Sept. 27, 1909
284	"White Oil"	National Oil Co.	W. H. Brock, Agt., Kinston	Oct. 8, 1909
1052	Red "C"	Red "C" Oil Mfg. Co.	Guilford Grocery Co., High Point.	Jan. 28, 1910
1184	Aurora	Red "C" Oil Mfg. Co.	W. B. Johnson, Fayetteville	Feb. 10, 1910
1189	Diamond White	Standard Oil Co.	C. W. Smith, Bogue	Feb. 8, 1910
1235	N. C. Test White	National Oil Co.	R. A. Fields, Williamsboro	Feb. 18, 1910
1396	White Oil, N. C. Test	National Oil Co.	W. H. Brock, Agt., Kinston	Feb. 26, 1910
1410	Aladdin	Standard Oil Co.	Parsons Drug Co., Wadesboro	Feb. 25, 1910
1434	Pratt's Astral	Standard Oil Co.	Sawyers Grocery Co., Belhaven	Mar. 8, 1910
1436	Electric Safety	Richmond Oil Co.	J. B. Day, Bethel Hill	Mar. 5, 1910
1441	Diamond White	Standard Oil Co.	J. N. Mason, Durham	Mar. 9, 1910
1443	Diamond White	Standard Oil Co.	C. H. Higgins, Wake Forest	Mar. 11, 1910
1482	Diamond White	Standard Oil Co.	Standard Oil Co., Wilmington	Mar. 14, 1910
1483	Aladdin	Standard Oil Co.	Standard Oil Co., Wilmington	Mar. 14, 1910
1515	White Radium	N. C. Oil Co.	Felmet Bros., Asheville	Mar. 17, 1910
1553	Old Yadkin	Standard Oil Co.	Holcomb Bros. Co., Elkin	Mar. 19, 1910
1555	Crystal Red	Richmond Oil Co.	J. R. Ferguson, Merchant, Sadler.	Mar. 22, 1910
1588	Water White	Gulf Refining Co.	Cape Fear Oil Co., Wilmington	Mar. 22, 1910
1591	Aladdin	Standard Oil Co.	Standard Oil Co., Wilmington	Mar. 26, 1910
1592	Diamond White	Standard Oil Co.	Standard Oil Co., Wilmington	Mar. 26, 1910
1637	Aladdin	Standard Oil Co.	C. W. Hanks, Pittsboro	Mar. 30, 1910
1651	White Lucent Premium.	Harwood Bros., Richmond.	Dr. A. S. Harrison, Enfield	Mar. 25, 1910
1674	Superba	National Oil Co.	T. W. Tilley, Smith, R. F. D.	April 1, 1910
1675	Soline Lamp Oil	Crown Oil and Wax Co.	J. R. Bell, Morehead City	April 1, 1910
1684	Orion Safety	Freedom Oil Works Co.	W. T. Shelton, Sandy Ridge	April 2, 1910
1691	Blue Grass	Indian Refining Co.	C. L. Emmerson, Salisbury	April 6, 1910
1734	Diamond White	Standard Oil Co.	S. A. C. Spence, Salisbury	April 9, 1910
1740	Aladdin	Standard Oil Co.	Thoone & Boon, Saluda	Mar. 28, 1910
1749	N. C. Test White	National Oil Co.	National Oil Co., Beaufort	April 11, 1910
1750	N. C. Test Red	National Oil Co.	National Oil Co., New Bern	April 13, 1910

No standard for residue had been adopted at the time these samples were taken.

KEROSENE.

Laboratory Number.	Flash—Elliott Cup.	Gravity at 60° F.		Viscosity at 68° F.	Distillation Test. Per Cent by Volume.			Residue at 300° C. (572° F.) (% by weight.)	Photometric Test. Candle Power.		
		Specific.	Baume.		Distillate. Below 250° C.	Distillate. 250–275° C.	Distillate. 275–300° C.		After ½ hour.	After 7½ hours.	Percentage Drop in Candle Power in 7 hours.
63	81°F	.802	44.6	1.13	68.5	12.5	11.0	7.6	7.89	6.85	13.2
110	108	.792	46.8	1.16	63.2	17.0	11.5	6.7	7.80	6.36	18.5
284	115	.820	40.8	1.16	54.3	19.2	15.5	10.5	7.44	5.45	26.8
1052	85	.795	46.2	1.16	49.2	12.5	18.5	19.0	6.86	5.04	26.5
1184	110	.819	41.0	1.18	56.6	16.0	17.5	9.1	7.92	6.18	22.0
1189	128	.807	43.5	1.26	39.0	16.0	23.5	18.2	8.10	2.83	65.1
1235	108	.819	41.0	1.18	59.8	18.0	14.5	7.0	7.72	7.03	8.9
1396	110	.820	40.8	1.21	41.3	15.0	25.0	16.2	7.74	6.98	9.8
1410	96	.810	42.8	1.13	65.1	16.0	16.4	1.0	7.49	6.75	9.9
1434	108	.810	42.8	1.15	65.8	14.3	17.5	2.1	7.64	6.73	11.9
1436	108	.818	41.2	1.15	67.4	14.2	10.5	6.9	7.52	6.82	9.3
1441	108	.817	41.4	1.18	69.6	14.6	10.0	6.0	7.62	6.63	13.0
1443	106	.813	42.2	1.16	56.0	14.1	18.0	11.4	7.88	6.92	10.9
1482	103	.808	43.3	1.09	72.9	13.5	11.7	1.7	7.44		
1483	103	.808	43.3	1.08	79.4	12.7	6.2	1.4	7.68	7.29	5.1
1515	116	.813	42.2	1.12	66.2	14.5	15.2	3.9	7.79	7.36	5.5
1553	107	.817	41.4	1.17	60.5	18.5	14.5	5.0	7.92	7.25	8.5
1555	112	.820	40.8	1.16	54.9	17.2	19.0	8.4	7.52	7.07	6.0
1588	122	.802	44.6	1.10	73.2	14.5	7.2	3.0	7.83	7.36	6.0
1591	102	.808	43.3	1.10	60.2	19.2	17.8	1.5	7.83	7.00	10.6
1592	106	.809	43.0	1.08	72.2	13.6	12.0	1.2	7.76	6.68	13.9
1637	102	.808	43.3	1.08	74.0	16.5	7.0	1.5	7.68	4.81	37.4
1654	94	.807	43.5	1.14	68.8	14.0	12.2	5.0	7.86	7.40	5.9
1674	104	.788	47.8	1.09	68.3	15.0	10.0	5.1	7.44	6.57	11.7
1675	104	.790	47.2	1.16	59.4	12.5	20.0	7.9	7.52	6.34	15.7
1684	112	.810	42.8	1.15	69.6	14.0	13.0	2.0	7.93	7.18	9.5
1691	116	.817	41.4	1.14	65.8	16.0	14.5	4.7	7.84	7.02	10
1734	106	.817	41.4	1.16	59.7	15.0	18.0	7.1	7.40	7.07	4
1740	102	.807	43.5	1.11	72.2	16.0	8.5	1.9	8.01	7.40	7
1749	110	.822	40.4	1.16	43.0	15.0	23.0	19.6	7.49	6.92	7
1750	110	.819	41.0	1.17	57.3	18.0	17.5	7.0	8.22	7.29	11.3

ANALYSES OF

Laboratory Number	Name of Oil.	Name of Oil Company.	Sold by	Date Sampled.
1751	N. C. Test White	National Oil Co.	National Oil Co., New Bern	April 13, 1910
1752	Soline Lamp Oil	Crown Oil and Wax Co.	W. S. Bell, Newport	April 14, 1910
1758	Red C	Red "C" Oil Mfg. Co.	E. J Cheatham, Franklinton	April 15, 1910
1763	Star Light Prime White.	Indian Refining Co.	W. A. Fowler, Mgr., Greensboro.	April 12, 1910
1764	Crystal White	Richmond Oil Co.	W. P Ware, Reidsville	April 15, 1910
1765	Crystal White	Richmond Oil Co.	W. P. Ware, Reidsville	April 15, 1910
1766	Crystal White	Richmond Oil Co.	W. P. Ware, Reidsville	April 13, 1910
1779	White "C"	Red "C" Oil Mfg. Co.	M. C. Braswell, Battleboro	April 18, 1910
1780	Aurora Water White	Red "C" Oil Mfg. Co	M. C. Braswell, Battleboro	April 18, 1910
1798	Aurora	Red "C" Oil Mfg. Co.	J. R. and J. G. Moye, Greenville.	April 14, 1910
1803	Star Light	Indian Refining Co.	F. G. Tullidge, Charlotte	April 19, 1910
1823	Water White	Indian Refining Co.	Indian Refining Co., Durham	April 19, 1910
1815	Water White	The Texas Co.	W. B. Ross, Mgr., Greensboro	April 20, 1910
1824	Water White	The Texas Co.	The Texas Co., Durham	April 21, 1910
1861	Bright Kerosene	National Oil Co.	National Oil Co., New Bern	April --, 1910
1871	Superba	National Oil Co.	S. W. Beasley, Plymouth	April 28, 1910
1883	Indian Fancy	Indian Refining Co.	F. G. Tullidge, Charlotte	April 30, 1910
1893	Water White	Cape Fear Oil Co.	Cape Fear Oil Co., Jacksonville	May 5, 1910
1905	Bright Kerosene	National Oil Co.	W. H. Brock, Agt., Kinston	April 27, 1910
1929	Aurora Red	Red "C" Oil Mfg. Co.	L. S. Dillon, Belhaven	May 10, 1910
1943	Crystalite	The Texas Co.	J. H. Morrison, Charlotte	May 3, 1910
1945	Blue Grass	Indian Refining Co.	F. G. Tullidge, Charlotte	May 5, 1910
1954	Crystaline	Chas. H. Moore Oil Co.	A. M. Jones, Crumpler, R. F. D.	May 4, 1910
1975	Liberty Light Oil	Sherwood Bros.	Collins & Gillett, Maysville	May 11, 1910
2161	Tenn. Test	Standard Oil Co.(?)	E. P. Kilpatrick, Patrick	June 3, 1910
2208	Diamond White	Standard Oil Co.	Standard Oil Co., Wilmington	June 9, 1910
2351	Crystal	Petroleum Oil Co.	----------, Lynn	July 1, 1910
2478	Red Burning Oil	Sherwood Bros.	J. L. Riggs, Bayboro	July 22, 1910

KEROSENE—CONTINUED.

Laboratory Number.	Flash—Elliott Cup.	Gravity at 60° F.		Viscosity at 68° F.	Distillation Test. Per Cent by Volume.			Residue at 300° C. (572° F) (% by weight.)	Photometric Test. Candle Power.		
		Specific.	Baume.		Distillate below 250° C.	Distillate 250–275° C.	Distillate, 275–300° C.		After ½ hour.	After 7½ hours.	Percentage Drop in Candle Power in 7 hours.
1751	110	.822	40.4	1.20	54.7	13.0	21.0	11.9	8.21	7.76	5.5
1752	116	.796	46.0	1.19	59.5	11.5	15.0	9.9	7.07	5.91	16.4
1758	110	.792	46.8	1.16	66.7	14.5	14.0	4.5	7.56	4.94	34.7
1763	114	.820	40.8	1.21	53.2	18.5	20.5	7.5	7.93	7.00	11.7
1764	108	.820	40.8	1.19	54.6	18.5	17.0	9.1	8.12	6.83	15.9
1765	108	.820	40.8	1.19	51.6	15.5	20.0	9.9	7.72	5.98	22.5
1766	108	.820	40.8	1.19	51.3	12.5	26.4	10.4	8.30	7.02	15.4
1779	104	.792	46.8	1.17	53.0	15.0	20.0	11.5	6.91	5.57	19.4
1780	110	.820	40.8	1.20	53.1	19.0	21.5	6.1	5.84	1.55	73.5
1798	110	.820	40.8	1.21	55.0	18.0	18.5	7.6	7.47	6.18	17.3
1803	108	.819	41.0	1.16	55.8	15.0	22.0	6.9	8.21	6.31	23.1
1823	110	.811	42.6	1.16	75.5	12.5	9.5	2.4	8.29	7.66	7.6
1815	106	.809	45.0	1.10	83.6	15.0	0.0	1.0	8.27	8.15	1.4
1824	106	.800	45.0	1.10	85.5	7.5	6.0	0.9	8.46	7.83	7.5
1861	105	.816	41.6	1.14	61.9	16.0	16.5	5.1	7.76	7.14	8.0
1871	104	.792	46.8	1.18	53.7	13.5	14.5	17.1	7.13	5.72	19.8
1883	116	.810	42.8	1.09	72.1	15.0	9.5	3.5	8.46	7.36	13.0
1893	116	.806	43.8	1.09	76.7	12.0	6.0	5.2	8.27	7.14	13.6
1905	104	.816	41.6	1.10	62.2	17.0	14.0	5.6	8.19	7.14	12.8
1929	104	.807	43.5	1.14	57.6	16.5	15.0	10.1	8.41	6.21	26.2
1943	106	.803	44.4	1.05	80.9	11.5	6.0	1.0	8.32	7.36	11.5
1945	114	.811	42.6	1.07	82.3	9.0	7.0	1.2	8.27	7.22	12.7
1954	114	.816	41.6	1.15	66.8	15.0	10.5	7.5	8.25	7.07	14.3
1975	114	.797	45.7	1.15	60.2	15.0	13.5	10.7	6.42	4.94	23.1
2161	124	.823	40.2	1.16	45.5	18.0	22.5	14.4	7.93	7.25	8.6
2208	108	.811	42.6	1.09	64.5	14.0	14.0	7.2	7.70	7.17	6.9
2351	108	.790	47.2	1.08	67.5	12.0	13.0	7.7	7.51	5.74	23.6
2478	160	.810	42.8	1.14	64.0	25.0	8.0	3.0	7.52	4.97	33.9

ANALYSES OF KEROSENE.

Laboratory Number.	Name of Oil.	Name of Oil Company.	Sold by	Date Sampled.	Flash—Elliott Cup.	Gravity at 60° F.		Viscosity at 68° F.	Distillation Test			
						Specific.	Baume.		Per Cent Volume by			
									Distillate below 250° C.	Distillate 250-275° C.	Distillate 275-300° C.	Residue at 300° C. (572° F.) (% by weight.)
42	Crystal White	Richmond Oil Co.	W. P. Ware, Reidsville	July 6, 1909	89	.807	43.5	1.14	70.3	13.5	12.5	3.1
51	Aladdin	Standard Oil Co.	T. R. Caffey, Wilkesboro	July 6, 1909	91	.805	44.0	1.10	73.1	13.5	9.0	3.6
53	Aladdin	Standard Oil Co.	Morrison Lead & Pipe Co., Taylorsville.	July 8, 1909	87	.805	44.0	1.12	75.3	13.5	8.0	2.6
56	Aladdin	Standard Oil Co.	Holister & Cox, New Bern	July 8, 1909	96	.805	44.0	1.12	64.5	14.0	15.0	5.5
58	Diamond White	Standard Oil Co.	E. M. Petoway, Jacksonville	July 6, 1909	87	.805	44.0	1.13	67.8	13.5	11.0	7.2
60	Columbia	Red "C" Oil Mfg. Co.	M. B. Humphrey, Jacksonville	July 6, 1909	108	.817	41.4	1.18	63.0	14.0	14.0	8.1
61	Diamond White	Standard Oil Co.	H. E. Gurley, Goldsboro	July 7, 1909	90	.812	42.4	1.14	74.3	11.0	11.0	3.5
68	Headlight	Red "C" Oil Mfg. Co.	M. T. Archbell, Washington	July 8, 1909	112	.790	47.2	1.11	66.5	16.0	11.0	5.0
98	Soline Red	N. C. Oil Co.	R. G. Hiatt & Co., Greensboro	July 8, 1909	108	.792	46.8	1.19	65.2	15.0	11.5	7.1
125	Soline	N. C. Oil Co	J. E. Fain, Murphy	Sept. 16, 1909	112	.807	43.5	1.16	66.7	15.0	12.5	7.7
287	Diamond White	Standard Oil Co	Edward Jordan, Siler City	Oct. 9, 1909	89	.810	42.8	1.17	60.3	15.5	14.2	11.0
299	Red Star Wrntd. High Test	National Oil Co.	New Bern Fruit Co., Agt., New Bern	Oct. 11, 1909	108	.813	42.2	1.16	59.4	18.0	14.3	7.5
432	Carnadine	Standard Oil Co.	J. J. Jones, Genl. Mdse., Nashville	Nov. 3, 1909	100	.805	44.0	1.10	81.4	11.5	5.0	1.7
611	White Oil	National Oil Co.	Sinclair Bros., Carthage	Dec. 2, 1909	110	.820	40.8	1.18	51.1	20.8	17.6	10.0
795	Long Burning	Standard Oil Co.	Standard Oil Co., Wilmington	Dec. 27, 1909	122	.800	45.0	1.10	70.7	16.0	11.0	1.0
915	Red "C" Oil	Red "C" Oil Mfg. Co.	Wm. H. Bailey, Mocksville	Jan. 12, 1910	98	.795	46.2	1.18	58.1	16.3	14.6	9.9
937	Diamond White	Standard Oil Co.	E. C. Dickenson, Beaufort, R.F.D.28	Jan. 19, 1910	129	.807	43.5	1.22	45.1	14.0	24.0	17.2

953	Aladdin	Standard Oil Co	Lawter Bros., Melvin Hill	Jan. 18, 1910	83	.808	43.3	1.08	81.0	11.0	6.5	1.5
963	Aladdin Security	Standard Oil Co.	R. J. Shields, Hobgood	Jan. 22, 1910	102	.805	44.0	1.10	69.1	15.6	12.9	1.2
1016	Superba	National Oil Co	S. W. Beasley, Plymouth	Jan. 19, 1910	87	.785	48.4	1.16	67.7	16.4	8.1	7.5
1109	Aurora Water White	Red "C" Oil Mfg. Co.	E. T. Webb, North Harlow	Jan. 27, 1910	90	.792	46.8	1.10	63.6	11.5	21.2	3.6
1137	Aladdin	Standard Oil Co	New Hope Farmers Union, New Hope.	Feb. 5, 1910	88	.805	14.0	1.12	67.3	16.0	13.5	2.6
1488	Aladdin	Standard Oil Co.	A. J. Vestal, Roaring Gap	Mar. 16, 1910	108	.810	42.8	1.12	62.7	17.3	15.4	3.7
1703	Aladdin	Standard Oil Co.	J. P. Wood, Holly Springs	April 8, 1910	102	.808	43.3	1.10	79.1	11.0	9.0	1.0
1701	Aladdin	Standard Oil Co.	T. B. Holt, Holly Springs	April 8, 1910	104	.808	43.3	1.10	73.0	18.1	8.2	0.6
1732	Aladdin Security	Standard Oil Co.	Wampum Store, Lincolnton	April 8, 1910	100	.807	43.5	1.14	73.9	13.0	11.0	2.2
1733	Diamond White	Standard Oil Co.	J. H. Rudisill, Lincolnton	April 8, 1910	100	.803	43.0	1.13	73.6	11.0	12.5	2.6
1735	Diamond White	Standard Oil Co	S. A. C. Spence, Salisbury	April 11, 1910	106	.816	41.6	1.17	66.2	15.0	15.0	3.4
1736	Aladdin Security	Standard Oil Co.	J. P. Phifer, Statesville	April 11, 1910	106	.811	42.6	1.14	63.2	16.5	16.5	2.7
1737	Aladdin Security	Standard Oil Co.	J. M. Patton, Morganton	April 12, 1910	106	.811	42.6	1.14	65.9	13.0	17.5	3.0
1755	Diamond White	Standard Oil Co.	J. N. Mason, Durham	April 15, 1910	108	.817	41.4	1.17	62.8	18.0	14.0	5.0
1756	Water White	Indian Refining Co.	W. E. Austin, Raleigh	April 15, 1910	110	.810	42.8	1.14	75.7	13.0	9.5	1.7
1757	White "C"	Red "C" Oil Mfg. Co.	E. J. Cheatham, Franklinton	April 15, 1910	110	.792	46.8	1.18	64.9	16.0	14.0	5.9
1759	Red "C"	Red "C" Oil Mfg. Co.	E. J. Cheatham, Franklinton	April 15, 1910	110	.792	46.8	1.17	64.5	13.5	15.5	6.7
1760	White "C"	Red "C" Oil Mfg. Co.	E. J. Cheatham, Franklinton	April 15, 1910	110	.792	46.8	1.17	59.5	16.0	17.0	7.2
1762	Diamond White	Standard Oil Co.	T. D. Meador, Mgr., Madison	April 11, 1910	108	.817	41.4	1.16	59.3	17.5	18.5	3.6
1767	Crystal Red	Richmond Oil Co.	W. P. Ware, Reidsville	April 13, 1910	106	.820	40.8	1.20	57.2	17.0	19.5	6.2
1768	Prime White	Indian Refining Co.	R. G. Hiatt & Co., Greensboro	April 16, 1910	112	.814	42.0	1.15	68.2	14.0	11.0	6.7
1776	Aurora Water White	Red "C" Oil Mfg. Co.	Liles Ruffin Co., Tarboro	April 4, 1910	116	.815	41.8	1.15	67.3	15.5	13.0	6.0
1785	Diamond White	Standard Oil Co.	C. R. Latham, Clifton	April 12, 1910	112	.815	41.8	1.19	63.7	20.0	14.0	1.0
1787	Diamond White	Standard Oil Co.	John Sapp, Sly	April 13, 1910	116	.816	41.6	1.20	59.0	19.0	19.5	1.7
1788	Fire Proof	Standard Oil Co.	Joe Worth, Creston	April 13, 1910	111	.812	42.4	1.20	60.9	17.5	18.5	2.2
1789	Aladdin	Standard Oil Co.	J. D. Thomas, Creston	April 13, 1910	112	.813	42.2	1.19	66.6	16.5	15.5	0.7

ANALYSES OF KEROSENE—CONTINUED.

Laboratory Number.	Name of Oil.	Name of Oil Company.	Sold by	Date Sampled.	Flash—Elliott Cup.	Gravity at 60° F.		Viscosity at 68° F	Distillation Test. Per Cent by Volume.			
						Specific.	Baume.		Distillate below 250° C.	Distillate 250–275° C.	Distillate 275–300° C.	Residue at 300° C. (572° F.) (% by weight.)
1792	Diamond Headlight	Standard Oil Co.	Chas. Tucker, Lansing, R. F. D.	April 15, 1910	116	.813	42.2	1.18	61.5	18.0	18.0	2.0
1799	Burning	Sherwood Bros.	J. B. Webb, Edenton	April 19, 1910	108	.804	44.2	1.18	56.9	19.0	16.0	7.1
1800	Liberty	Sherwood Bros.	J. B. Webb, Edenton	April 19, 1910	108	.795	46.2	1.18	56.5	17.0	20.0	6.1
1803	Diamond White	Standard Oil Co.	T. J. Ray, Elk Park	April 13, 1910	110	.818	41.2	1.18	60.8	19.0	19.0	1.0
1809	Aurora	Red "C" Oil Mfg. Co.	Overman & Co., Salisbury	April 21, 1910	114	.816	41.6	1.18	61.5	16.0	16.0	5.1
1828	Aurora Water White	Red "C" Oil Mfg. Co.	D. J. Rivenbark, Agt., Goldsboro	April 22, 1910	112	.817	41.4	1.14	67.8	11.5	11.5	5.2
1833	Prime White	Indian Refining Co.	I. R. Co., Raleigh	April 26, 1910	102	.817	41.4	1.17	62.6	15.5	14.5	6.9
1845	R. R. Water White	Standard Oil Co.	C. J. Norman (So. Ry. Co. Agt.) Spencer.	April 26, 1910	106	.810	42.8	1.16	68.2	9.0	12.0	10.9
1846	R. R. Water White	Standard Oil Co.	C. J. Norman (Sou. Ry. Co. Agt.) Spencer.	April 26, 1910	106	.810	42.8	1.17	73.8	11.0	12.0	3.4
1849	Fire Proof	Standard Oil Co.	W. T. Potts & Son, Highlands	April 23, 1910	104	.810	42.8	1.11	85.0	11.0	3.0	0.9
1930	Fancy Water White	Indian Refining Co.	N. C. Oil Co., Winston	Mar. 6, 1910	116	.808	43.3	1.10	79.2	12.5	6.5	1.5
1931	Water White	Superior Oil Works	N. C. Oil Co., Winston	May 9, 1910	106	.793	46.6	1.10	67.9	13.5	11.0	6.2
1947	R. R. Water White	Standard Oil Co.	So. Ry. Co. (C. J. Norman) Spencer.	May 10, 1910	106	.813	42.2	1.09	74.0	13.5	9.0	3.1
1970	Aladdin	Standard Oil Co.	Jno. S. Trotter, Franklin	May 12, 1910	106	.813	42.2	1.10	75.2	11.5	8.5	4.1
1989	Aladdin	Standard Oil Co.	E. D. Bowden & Son, Knott's Island	May 14, 1910	92	.808	43.3	1.09	74.0	13.5	8.5	3.1
1990	Aladdin	Standard Oil Co.	D. Jones & Son, Knott's Island	May 14, 1910	92	.808	43.3	1.09	75.5	11.0	9.5	3.1
2016	Aladdin	Standard Oil Co.	Thomas & Co., Wilmington	May 11, 1910	101	.809	43.0	1.08	80.0	11.5	6.0	1.4
2020	Aladdin	Standard Oil Co.	Creech & Woodall, Benson	May 17, 1910	104	.815	41.8	1.08	69.5	14.5	9.5	4.5

2070	S. C. Oil	Standard Oil Co.	Standard Oil Co., Wilmington	May 24, 1910	92	.810	42.8	1.08	70.0	14.5	11.0	3.9
2071	Aladdin	Standard Oil Co.	Standard Oil Co., Wilmington	May 26, 1910	100	.812	42.4	1.08	75.8	15.0	6.5	1.6
2133	Aladdin	Standard Oil Co.	J. V. Williamson, Carthage	June 3, 1910	103	.808	43.3	1.10	76.0	11.5	10.5	1.5
2207	Aladdin	Standard Oil Co.	Standard Oil Co , Wilmington	June 9, 1910	108	.811	42.6	.....	74.2	15.0	8.5	2.6
2511	Water White Hylite	Richmond Oil Co.	A. F. Smith, Fuquay Springs	July 29, 1910	112	.790	47.3	1.11	73.0	13.5	8.0	5.9
2526	Aladdin	Standard Oil Co.	H. C. Tucker, Weasel	July 26, 1910	100	.812	42.4	1.07	81.5	10.5	6.0	2.4
2580	Diamond White	Standard Oil Co.	S. V. Smith, Wilson Mill No. 3	Aug. 8, 1910	104	.810	42.8	1.08	74.0	14 5	7.0	4.5
2599	Diamond White	Standard Oil Co.	Seth Allen, Benson	Aug. 10, 1910	104	.807	43.5	1.08	81.5	10.0	4.5	1.4
2617	Blue Grass	Indian Refining Co.	J. R. Comer, Asbury	Aug. 11, 1910	112	.812	42.4	1.12	77.0	12.5	7.5	3.2
2618	Blue Grass Red	Indian Refining Co.	I. Freeman & Son, Steeds	Aug. 11, 1910	112	.807	43.5	1.12	75.5	13.5	7.0	4.7
2631	Continental	Atlantic Refining Co.	Mrs. B. E. Williams, Littleton	Aug. 13, 1910	122	.806	43.7	1.12	73.0	11.0	6.7	5.6
2926	B. Burning	Sherwood Bros.	J. W Hays, Chocowinity	Aug. 23, 1910	112	.802	44.6	1.10	64.5	17.0	12.0	7.6
2992	Crystallite	The Texas Co.	C. M. Sing, Raleigh	Sept. 6, 1910	110	.795	46.2	1.07	87.1	6.6	3.3	2.5
3030	Red B Burning	Sherwood Bros.	Gray & Wynn, Parmele	Sept. 13, 1910	118	.802	44.6	.....	66.2	16.3	10.5	6.7

SUMMARY OF SAMPLES RECEIVED FROM DECEMBER 1, 1909, TO FEBRUARY 10, 1910.

(Laboratory Numbers 574–1137 inclusive.)

Name of Company.	Name of Oil.	Number of Samples Received.	Number Flashing Below 100° F.	Average Flash of Samples Flashing Above 100° F.	Average Specific Gravity (uncorrected)	Average Baume Gravity.
Standard Oil Co.	Aladdin	248	5	103	.805	44.0
Standard Oil Co.	Diamond White	95		105	.809	43.0
Standard Oil Co.	Pratt's Astral	7		109	.792	46.8
Standard Oil Co.	Carnadine	5		104	.803	44.4
Standard Oil Co.	Red Illuminating	2		107	.805	44.0
Standard Oil Co.	Fire Proof	1		101	.805	44.0
Standard Oil Co.	Prime White	1		104	.805	44.0
Standard Oil Co.	Long Burning	1		122	.800	45.0
Red "C" Oil Mfg. Co	Red "C"	74	14*	109	.786	48.2
Red "C" Oil Mfg. Co.	White "C"	21		109	.786	48.2
Red "C" Oil Mfg. Co.	Aurora	29	1	103	.814	42.0
Red "C" Oil Mfg. Co.	Aurora Red	2		105	.810	42.8
Red "C" Oil Mfg. Co.	Columbia Headlight	1		104	.810	42.8
National Oil Co.	White Oil	12		105	.816	41.6
National Oil Co.	Superba	6	1	101	.787	48.0
National Oil Co.	Red Oil	1		108	.815	41.8
National Oil Co.	Mineral Seal	1			.820	40.8
North Carolina Oil Co.	Soline	5		110	.791	47.0
North Carolina Oil Co.	Crystal	2		111	.798	45.5
North Carolina Oil Co.	White Radium	5		110	.805	43.8
North Carolina Oil Co.	Red Radium	3		111	.797	45.8
Indian Refining Co.	White Radium	3		113	.807	43.5
Indian Refining Co.	Water White	1		112	.810	42.8
Indian Refining Co	Crystal	2		112	.808	43.3
Indian Refining Co.	White Crystal	1		112	.807	43.5
Indian Refining Co.	Prime White	1		112	.807	43.5
Indian Refining Co.	Radium	1		110	.810	42.8
Indian Refining Co	Comet	1		109	.813	42.2
Indian Refining Co.	Indian Fancy White	1		112	.810	42.8
Indian Refining Co.	Blue Grass	1		110	.807	43.5
Richmond Oil Co.	Crystal White	4		107	.814	42.0
Richmond Oil Co.	Electric Safety	2		108	.815	41.8
Richmond Oil Co.	Hylite	1		103	.785	48.4
Gulf Refining Co.	Water White	9		117	.801	44.8

SUMMARY OF SAMPLES CONTINUED.

Name of Company.	Name of Oil.	Number of Samples Received.	Number Flashing Below 100° F.	Average Flash of Samples Flashing Above 100° F	Average Specific Gravity (uncorrected).	Average Baume Gravity
Crown Oil & Wax Co.	Soline	5		110	.789	47.5
Freedom Oil Works	Soline	3		109	.788	47.8
Freedom Oil Works	Water White	1		112	.805	44.0
Freedom Oil Works	Prime White	1		110	.790	47.3
Petroleum Oil Co.	Crystal	5		118	.798	45.5
Cape Fear Oil Co.		1		126	.803	44.4
United Refining Co.	Soline	1		106	.790	47.3

*The 14 samples of Red "C" flashing below 100° were from a single carload.

NUMBER OF SAMPLES RECEIVED FROM EACH OIL COMPANY, DEC. 1, 1909, TO APRIL 4, 1910

(Laboratory Numbers 574 to 1652 inclusive.)

	Sample.	Per Cent of Total.
Standard Oil Co.	691	63.8
Red "C" Oil Mfg. Co.	226	20.9
National Oil Co.	40	3.7
North Carolina Oil Co.	29	2.7
Indian Refining Co.	27	2.5
Richmond Oil Co.	16	1.5
Gulf Refining Co.	15	1.4
Crown Oil and Wax Co.	12	1.1
Freedom Oil Works	14	1.3
Petroleum Oil Co.	7	1.1
Cape Fear Oil Co.	2	
United Refining Co	1	
Waverly Oil Works	1	
Galena Signal Oil Co.	1	
Total	1082	100.00

The above table does not show accurately the amount of oil sold by each company owing to the difference in the method of sampling oil from barrels and tank cars. In some cases, companies which do not refine their own oil are credited with less samples than were actually submitted, the samples being credited to the refining company.

Oils have been listed for registration in accordance with Section No. 1 of the regulations, as required in Section No. 1 of the law, by the following:

Atkinson Co., Elkin, N. C.
Adams Grain & Provision Co., Fayetteville, N. C.
Armfield Co., Fayetteville, N. C.
Aydlett Bros. Co., Elizabeth City, N. C.
Armstrong Grocery Co., New Bern, N. C.
Asheville Grocery Co., Asheville, N. C.
Blalock Hardware Co., Wadesboro, N. C.
Beaufort Grocery Co., Beaufort, N. C.
Blair Grocery Co., Galax, Va.
Boykin Grocery Co., Wilson, N. C.
Bell, W. S., Jr., Newport, N. C.
Blake, R. E., Wilmington, N. C.
Bear, Samuel Sr., & Sons, Wilmington, N. C.
Brunswick Grocery Co., Wilmington, N. C.
Breedlove & MacFarland, Oxford, N. C.
Brooks, J. W., Wilmington, N. C.
Barbour, J. G. & Sons, Clayton, N. C.
Baird Bros., Asheville, N. C.
Blanton, A., Grocery Co., Marion, N. C.
Barrett, G. & R., Inc., Norfolk, Va.
Brinkley, A. & Co., Norfolk, Va.
Barton Mountcastle Hdw. Co., Johnson City, Tenn.
Cape Fear Oil Co., Wilmington, N. C.
Crown Oil & Wax Co., Baltimore, Md.
Culbreth, J. H. & Co., Fayetteville, N. C.
Crumley, J. L. & Son, Bristol, Tenn.
Collins & Gillette, Maysville, N. C.
Cooper, W. B., Wilmington, N. C.
Carolina Distributing Co., Belhaven, N. C.
Carolina Distributing Co., Washington, N. C.
Cheraw Hardware & Supply Co., Cheraw, S. C.
Cross, N. S. Co., Inc., Suffolk, Va.
Carolina Grocery Co., Fayetteville, N. C.
Divine, M. W. & Co., Wilmington, N. C.
Dixie Grocery Co., Lincolnton, N. C.
Dilworth, W. J., Co., Norfolk, Va.
English Drug Co., Monroe, N. C.
Ellison Bros. Co., Washington, N. C.
Freedom Oil Works Co., Freedom, Pa.
Faucette Co., Inc., Bristol, Va.-Tenn.
Fennell & Hunt, Wilmington, N. C.

Flora, J. B. & Co., Elizabeth City, N. C.
Ferguson, W. B. & Co., Suffolk, Va.
Fulford, W. S. Hardware Co., Washington, N. C.
Fain Mayfield Co., Murphy, N. C.
Four Co., Inc., Norfolk, Va.
Gump, M. L., Johnson City, Tenn.
Gulf Refining Co., Atlanta, Ga.
Gore, D. L. Co., Wilmington, N. C.
Gentry, C. C. & Co., Elkin, N. C.
Ginn, J. T. & Co., Goldsboro, N. C.
Henderson, A. P. & Sons, Johnson City, Tenn.
Hazen & Lotspeich Co., Knoxville, Tenn.
Holmes Grocery Co., Wilmington, N. C.
Hoover, T. J., Asheboro, N. C.
Hollister, Chas. S., New Bern, N. C.
Harwood Bros., Richmond, Va.
Hashagen, F. E. Co., Wilmington, N. C.
Hood Bros. & Co., Southport, N. C.
Holcomb Bros. Co., Elkin, N. C.
Humphrey, M. B., Jacksonville, N. C.
Hackney, H. T. Co., Knoxville, Tenn.
Indian Refining Co., Cincinnati, Ohio.
Jacobi, N. Hardware Co., Wilmington, N. C.
Joyner & Rowland, Rocky Mount, N. C.
Jenkins, H. M. Co., Washington, N. C.
King, A. W. Co., Wilmington, N. C.
Kelly & Borum, Inc., Norfolk, Va.
Lichtenstein, D. Co., Inc., Tarboro, N. C.
Lockett Bros. Co., Inc., Johnson City, Tenn.
Lexington Hardware Co., Lexington, N. C.
Lucas & Lewis, New Bern, N. C.
Liles Ruffin Co., Inc., Tarboro, N. C.
McNair & Pearsall, Wilmington, N. C.
McNair, S. P. & Co., Wilmington, N. C.
McAulay, J. A., Mt. Gilead, N. C.
Moore, Chas. H. Oil Co., Cincinnati, Ohio.
Meador, T. D. Grocery Co., Madison, N. C.
Madison Grocery Co., Madison, N. C.
Merchants Union Co., Leaksville, N. C.
Morton, J. B., Morehead City, N. C.
Morris, C. G. & Co., Washington, N. C.
Morrison, J. K. & Sons Co., Statesville, N. C.
Morrison Provision Co., Hickory, N. C.
Mixon, E. R. & Co., Washington, N. C.
Mt. Gilead Store Co., Mt. Gilead, N. C.

Mustin Robertson Co., Asheville, N. C.
Murphy Jenkins & Co., Tarboro, N. C.
Moses, Max & Co., Salisbury, N. C.
Moir & Co., Stuart, Va.
North Carolina Oil Co., High Point, N. C.
National Oil Co., Norfolk, Va.
Nansemond Grocery Co., Suffolk, Va.
New Bern Grocery Co., New Bern, N. C.
Oberndorfer Co., Inc., Norfolk, Va.
Petroleum Oil Co., Anderson, S. C.
Peters, R. B. Grocery Co., Tarboro, N. C.
Pedin, J. W. & Co., Norfolk, Va.
Pearsall & Co., Wilmington, N. C.
Pipkin, R. E. Gold-boro, N. C.
Peterson, E. Co., Washington, N. C.
Pugh & Brooks Co., New Bern, N. C.
Paul, F. G. & Bro., Washington, N. C.
Pamlico Grocery Co., Washington, N. C.
Red "C" Oil Mfg. Co., Baltimore, Md.
Robinson, Wm. C. & Son Co., Baltimore, Md.
Richmond Oil Co., Richmond, Va.
Ramsey, J. E., Beaufort, N. C.
Rankin, A. E. Co., Fayetteville, N. C.
Roberts & Hurst, New Bern, N. C.
Rea, J. K., Edenton, N. C.
Roper & Co., Inc., Petersburg, Va.
Standard Oil Co. (New Jersey), Baltimore, Md.
Standard Oil Co. of Kentucky, Inc., Covington, Ky.
Standard Oil Co. of Louisiana, Memphis, Tenn.
Stokes Grocery Co., Walnut Cove, N. C.
Shouns Grocery Co., Shouns, Tenn.
Stevens, C. W. Co., Elizabeth City, N. C.
Southern Grocery Co., Henderson, N. C.
Stevenson, J. C. Co., Wilmington, N. C.
Stone Co., Wilmington, N. C.
Smithfield Hardware Co., Smithfield, N. C.
Sawyer Grocery Co., Belhaven, N. C.
Slayden Fakes & Co., Asheville, N. C.
Sawyer-Stevens-Cowper Co., Inc., Norfolk, Va.
Sherwood Bros., Baltimore, Md.
Superior Oil Works, Limited, Warren, Pa.
Sykes, Ernest E., Fayetteville, N. C.
Saunders, B. L. & Co., Suffolk, Va.
Southern Distributing Co., Norfolk, Va.
Southern Supply Co., Norfolk, Va.

Sharber & White Hardware Co., Elizabeth City, N. C.
Statesville Grocery Co., Statesville, N. C.
Standard Grocery Co., Elizabethton, Tenn.
Shonn, G. H. & Co., Johnson City, Tenn.
Snider Raney Co., Salisbury, N. C.
Summers Parrott Hardware Co., Johnson City, Tenn.
Thomas, Alonzo, Beaufort, N. C.
Taylor, J. A., Wilmington, N. C.
Texas Co., Houston, Texas.
Tarkington, L. D., Manteo, N. C.
Toxey, A. F. & Co., Elizabeth City, N. C.
Troutdale Trading Co., Troutdale, Va.
United Refining Company, Warren, Pa.
Vollers, H. L., Wilmington, N. C.
Voight, Robt. P. Co., Norfolk, Va.
Woodard, C., Co., Wilson, N. C.
Wilson Grocery Co., Wilson, N. C.
Worth Co., Wilmington, N. C.
Watters, Jos. H., Wilmington, N. C.
Waverly Oil Works Co., Pittsburg, Pa.
Wells Grocery Co., Wilson, N. C.
Woodley, W. J., Elizabeth City, N. C.
Woodard, J. A. & Co., Edenton, N. C.

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE

RALEIGH

Volume 31. OCTOBER, 1910. Number 10

ANNUAL REPORT

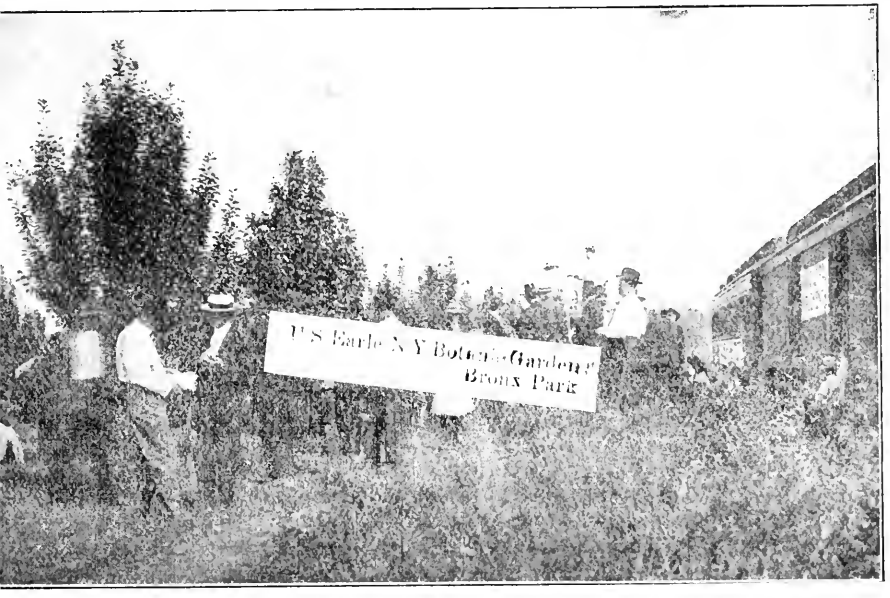
OF

FARMERS' INSTITUTES

BY

T. B. PARKER

DIRECTOR OF FARMERS' INSTITUTES



PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE

W. A. GRAHAM, Commissioner, *ex officio* Chairman, Raleigh.

H. C. CARTER	Fairfield	First District.
K. W. BARNES	Lucama	Second District.
WILLIAM DUNN	New Bern	Third District.
ASHLEY HORNE	Clayton	Fourth District.
R. W. SCOTT	Haw River	Fifth District.
A. T. MCCALLUM	Red Springs	Sixth District.
J. P. MCRAE	Laurinburg	Seventh District
WILLIAM BLEDSOE	Gale	Eighth District.
W. J. SHUFORD	Hickory	Ninth District.
A. CANNON	Horse Shoe	Tenth District.

OFFICERS AND STAFF

W. A. GRAHAM	Commissioner.
ELIAS CARR	Secretary.
B. W. KILGORE	State Chemist, Director Test Farms.
FRANKLIN SHERMAN, JR.	Entomologist.
W. N. HUTT	Horticulturist.
H. H. BRIMLEY	Naturalist and Curator.
T. B. PARKER	Demonstration Work.
W. M. ALLEN	Food Chemist.
W. G. CHRISMAN	State Veterinarian.
BRONSON BARLOW	Botanist.
J. M. PICKEL	Assistant Chemist.
W. G. HAYWOOD	Fertilizer Chemist.
G. M. MACNIDER	Feed Chemist and Microscopist.
L. L. BRINKLEY	Assistant Chemist.
S. C. CLAPP	Nursery and Orchard Inspector.
S. B. SHAW	Assistant Horticulturist.
Z. P. METCALF	Assistant Entomologist.
J. A. CONOVER	Dairyman.
J. L. BURGESS	Agronomist.
E. L. WORTHEN	Soil Investigations.
*W. E. HEARN	Soil Survey.
J. Q. JACKSON	Assistant Chemist.
W. A. SMITH	Assistant Chemist.
W. H. STROWD	Assistant Chemist.
E. W. THORNTON	Assistant Chemist.
W. H. EATON	Assistant Dairyman.
E. P. WOOD	Assistant Veterinarian.

R. W. SCOTT, JR., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. MEACHAM, Superintendent Iredell Test Farms, Statesville, N. C.
JOHN H. JEFFERIES, Superintendent Pender Test Farm, Willard, N. C.
R. W. COLLET, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, October 25, 1910.

SIR:—I herewith hand to you my report of the Farmers' and Women's Institutes for the current year and recommend the same be used for the October BULLETIN.

Respectfully submitted,

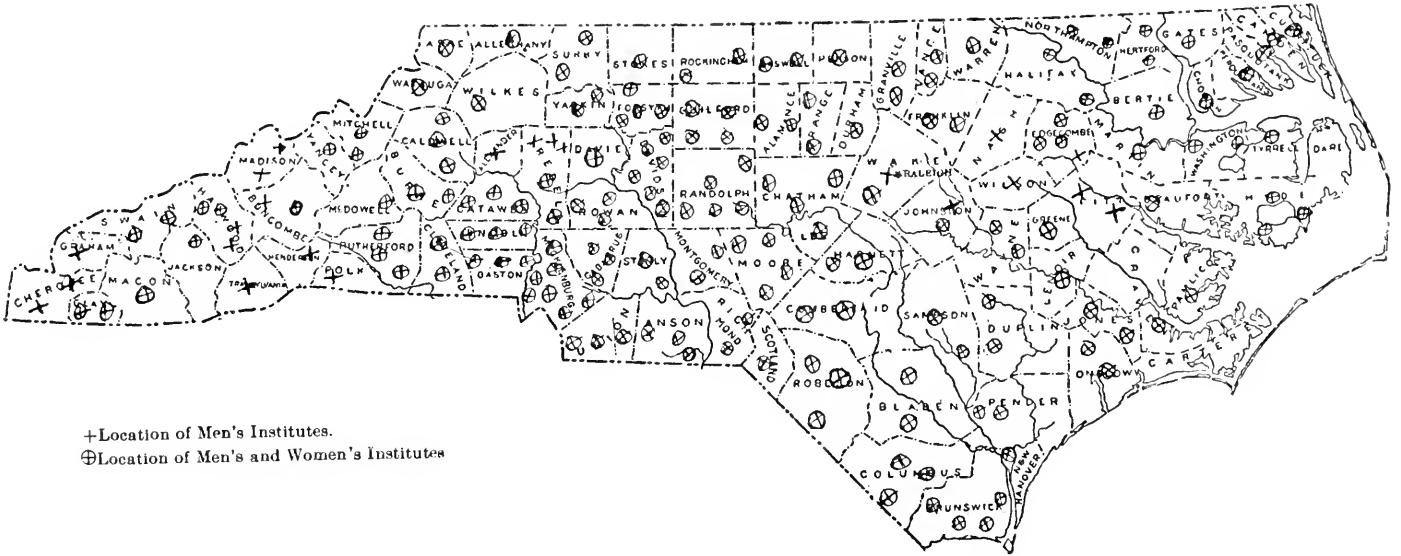
T. B. PARKER,

State Director Farmers' Institutes.

To HON. W. A. GRAHAM,

Commissioner of Agriculture.

CONTENTS.



1910 Map Showing Location of Farmers' Institutes for Men and Women Held Under the Auspices of the State Board of Agriculture.
T. B. PARKER, Director of Institutes.

REPORT OF FARMERS' INSTITUTE WORK, 1910.

T. B. PARKER, DIRECTOR.

During the Institute year from December 1st, 1909, to November 1st, 1910, there have been held 392 institutes under the direction of the State Department of Agriculture. Of this number 196 were regular Farmers Institutes for men, 173 were institutes for women, 17 orchard demonstration institutes, 5 corn institutes, and one three days' Round-up Institute or Farmers' Convention. During the year institutes were held in 96 of the 98 counties in the State, Dare and Carteret only not having institutes.

The growth of institutes in the State is shown in the following table:

1898—	28	institutes in	27 counties.
1903—	17	institutes in	16 counties.
1904—	58	institutes in	58 counties.
1905—	79	institutes in	76 counties.
1906—	136	institutes in	91 counties.
1907—	169	institutes in	93 counties.
1908—	234	institutes in	95 counties.
1909—	247	institutes in	93 counties.
1910—	392	institutes in	96 counties.

There were applications for several more institutes, but they came largely from counties in which several had already been provided for.

In addition to the above there have been two institutes held for colored farmers. Interest in institute work has been more manifest among the farmers this year than ever before.

In our institute work the newspapers of the State have given to us unstinted co-operation and assistance, by announcing places and dates of the meetings, printing the programs in full and urging their readers to attend them. At each institute for men a premium of one dollar was offered for the best five ears of a pure bred corn and a like sum was offered at the women's institutes for the best loaf of bread baked and exhibited by a girl or woman living on the farm. Many of the newspapers of the State supplemented these premiums by giving a year's subscription to the man or woman exhibiting the best five ears of corn and the best loaf of bread at the institutes in their county. *The Progressive Farmer* made a special offer of a year's subscription to that paper to any girl or woman exhibiting the best plate of biscuits at any institute. It affords me pleasure to make this public acknowledgment of the unstinted helpfulness of the editors of the State press in this work.

LECTURERS AND SUBJECTS.

INSTITUTE LECTURERS.	No. Institutes Attended.	SUBJECTS
MISS BESSIE BATES	2	Bread Making. Household Economy
FRANK BLACKFORD Ohio.	19	Tobacco Culture. Mistakes on the Farm
J. L. BURGESS Agronomist, State Department of Agriculture.	49	Relation of Crop Varieties to Soil Types Seed Selection. Green Manuring. Improvement of Soils by Legumes.
A. CANNON	14	Preparation of the Soil and the Production of Corn.
DR. W. G. CHRISMAN State Veterinarian.	38	Live Stock on the Farm. Contagious Diseases of Live Stock and How to Treat Them.
J. A. CONOVER Dairy Expert in charge of Dairy Demonstration Work in North Carolina for the State and United States Departments of Agriculture.	24	Farm Dairying. Home Butter Making. North Carolina as a Dairy State. Need of Live Stock in North Carolina
W. T. EATON, Assistant to Mr. Conover	19	Value of Live Stock on the Farm.
A. L. FRENCH Farmer.	25	Live Stock for North Carolina Soil Improvement. Seed Selection.
MRS. SUE V. HOLLOWELL	33	The Influence of the Woman in the Home. The Purposes and Aims of the Woman's Institutes.
W. N. HUTT Horticulturist, State Department of Agriculture.	19	Orchard Management. The Farm Fruit Garden. Soil Improvement. Commercial Apple Growing
MRS. W. N. HUTT	39	Foods, Their Cooking and Use. The Prevention of Disease in the Home
MISS M. L. JAMISON Director Domestic Science, State Normal and Industrial College.	21	Sanitation. Household Economies Cookery.
MISS L. H. JAMISON Teacher of Domestic Science, Durham High School.	25	Bread Making Hygiene. Sanitation, etc
J. S. JEFFREY Poultryman, North Carolina Agricultural Experiment Station.	26	Farm Poultry. Farm Butter Making
MRS. J. S. JEFFREY	14	Household Appliances Cookery.
B. W. KILGORE State Chemist.	3	Commercial Fertilizers and Fertilizer Materials
MRS. CHARLES MCKIMMON	2	Home Gardening Bread Making. Insect Pests.
GEO. P. MILLER Farmer.	5	Orchard Management Soil Improvement
E. S. MILLSAPS Farm Demonstrator	11	Corn Growing. Soil Improvement Cotton Culture

LECTURERS AND SUBJECTS

INSTITUTE LECTURERS	No. Institutes Attended	SUBJECTS
F. B. NEWELL..... Farm Demonstrator	18	Seed Selection. Soil Improvement Corn Growing.
C. L. NEWMAN..... Professor of Agriculture, North Carolina College of Agriculture.	12	Cotton Breeding. Soil Improvement. Winter Gardening. The Cowpea. Commercial Fertilizers
T. B. PARKER..... Director of Farmers' Institutes and Demonstrator, State Department of Agriculture.	41	Commercial Fertilizers. Corn Culture. Soil Improvement by Legumes Alfalfa.
T. F. PARKER Farmer.	28	Live Stock on the Farm. Soil Improvement. Commercial Fertilizers. Home Mixed Fertilizers.
MISS EDNA REINHARDT School Teacher.	23	Country Schools.
JNO. W. ROBINSON..... Farmer.	13	Farm Dairying. Advantages of Live Stock on the Farm.
DR. G. A. ROBERTS..... Veterinarian, A. and M. College	29	Care and Feeding of Farm Work Stock. Diseases of Live Stock. Types of Horses, Cattle and Sheep.
HARTWELL SCARBORO Farmer.	17	Peanut Culture. Pork Raising. Soil Improvement.
R. W. SCOTT..... Farmer.	23	Corn Culture. How a Farmer May Succeed in North Carolina without Growing Cotton or Tobacco. The Advantages of a Diversified Agriculture.
MISS JOSEPHINE SCOTT Teacher.	23	The House-fly. Suggestions in Household Work. The Home Garden.
S. B. SHAW..... Assistant Horticulturist, State Department of Agriculture.	48	The Farm Vegetable Garden. Suggestions in Fruit Growing. Production and Preservation of Home Food Supplies.
FRANKLIN SHERMAN, JR..... Entomologist, State Department of Agriculture.	29	Insect Pests and How to Combat Them. Selection of Seed Corn. Suggestions for the Improvement of Farm Homes. Improved Farm Methods as Preventative for Insect Pests.
DR. F. L. STEVENS..... Professor of Botany and Plant Diseases, North Carolina College of Agriculture.	16	Plant Diseases and Spraying. Some Preventable Human Diseases.
MRS. F. L. STEVENS.....	49	Home Nursing and Prevention of Diseases. Saving Steps in the Home. The Home Garden. Importance of a Properly Selected Diet for the Young Child. Food Values.
DR. E. P. WOOD..... Assistant Veterinarian.	12	Diseases of Live Stock.

FARMERS' INSTITUTES, 1910.

Date.	County.	Location.	Lecturers Supplied by the State.
Aug. 11	Alamance	Elon College	Burgess, Wood, Shaw.
Aug. 12	Alamance	Mebane	Burgess, Wood, Shaw.
Aug. 15	Alexander	Taylorsville	Roberts, Robinson, Parker, T. F
Aug. 5	Alleghany	Sparta	Stevens, Parker, T. F.
July 19	Anson	Morven	Newman, French, Jeffrey.
July 21	Anson	Peachland	Newman, French, Jeffrey.
July 20	Anson	Wadesboro	Newman, French, Jeffrey.
Aug. 6	Ashe	Jefferson	Stevens, Parker, T. F.
Jan. 27	Beaufort	Washington	Hutt, Eaton, Parker, T. B.
Jan. 26	Bertie	Windsor	Sherman, Chrisman, Newell.
Jan. 17	Bladen	Councils	Burgess, Shaw, Scarboro.
Jan. 15	Bladen	White Oak	Burgess, Shaw, Scarboro.
Jan. 21	Brunswick	Ash	Burgess, Shaw, Scarboro.
Jan. 22	Brunswick	Shallotte	Burgess, Shaw, Scarboro.
Jan. 24	Brunswick	Supply	Burgess, Shaw, Scarboro.
Jan. 25	Brunswick	Bolivia	Burgess, Shaw, Scarboro.
Aug. 11	Buncombe	Swannanoa	Roberts, Millsaps, Miller.
July 25	Buncombe	Leicester	Sherman, Cannon, Robinson.
Mar. 11	Buncombe	Asheville	Schaub, Parker, T. B.
July 28	Burke	Morganton	Burgess, Chrisman, Shaw.
July 29	Burke	Connelly Springs	Burgess, Chrisman, Shaw.
July 28	Cabarrus	Mount Pleasant	Scott, Conover.
July 30	Cabarrus	Concord	Burgess, Wood, Shaw.
Aug. 1	Cabarrus	Harrisburg	Burgess, Wood, Shaw.
Aug. 9	Caldwell	Yadkin Valley	Stevens, Robinson, Parker, T. F.
Aug. 10	Caldwell	Lenoir	Stevens, Robinson, Parker, T. F.
Aug. 11	Caldwell	Granite Falls	Stevens, Robinson, Parker, T. F.
Jan. 18	Camden	Camden Courthouse	Sherman, Chrisman, Newell.
July 18	Caswell	Leasburg	Roberts, Blackford, Parker, T. F.
July 19	Caswell	Locust Hill	Roberts, Blackford, Parker, T. F.
Aug. 4	Catawba	Sherrills Ford	Scott, Conover.
Aug. 3	Catawba	Ford's Store	Scott, Conover.
July 27	Catawba	Newton	Scott, Conover.
July 12	Chatham	Pittsboro	Newman, French, Jeffrey.
Aug. 8	Chatham	Goldston	Burgess, Chrisman, Shaw.
Aug. 9	Chatham	Siler City	Burgess, Chrisman, Shaw.
July 29	Cherokee	Andrews	Sherman, Cannon, Roberts.
July 30	Cherokee	Murphy	Sherman, Cannon, Roberts.
Jan. 20	Chowan	Edenton	Sherman, Chrisman, Newell.

FARMERS' INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State.
Aug. 1	Clay	Hayesville	Sherman, Cannon, Roberts
Aug. 2	Clay	Brasstown	Sherman, Cannon, Roberts
July 30	Cleveland	Shelby	French, Millsaps, Jeffrey
Aug. 6	Cleveland	Casar	Scott, Conover.
Jan. 18	Columbus	Chadbourn	Burgess, Shaw, Scarboro
Jan. 19	Columbus	Mount Tabor	Burgess, Shaw, Scarboro
Jan. 20	Columbus	Old Dock	Burgess, Shaw, Scarboro.
Jan. 26	Craven	New Bern	Eaton, Hutt, Parker, T. B
Jan. 11	Cumberland	Fayetteville	Burgess, Shaw, Scarboro
July 20	Cumberland	Raeford	Scott, Conover.
Jan. 19	Currituck	Currituck Courthouse	Sherman, Chrisman, Newell
July 25	Davidson	Enterprise	Stevens, Blackford, Parker, T. F
July 26	Davidson	Wallburg	Stevens, Blackford, Parker, T F
Aug. 3	Davidson	Linwood	Burgess, Wood, Shaw.
Aug. 4	Davidson	Thomasville	Burgess, Chrisman, Shaw
Aug. 8	Davidson	Reeds	Scott, Conover.
Aug. 13	Davidson	Denton	Scott, Conover.
July 19	Davis	Mocksville	Burgess, Wood, Shaw.
Jan. 13	Duplin	Calypso	Eaton, Hutt, Parker, T. B
Jan. 15	Duplin	Rose Hill	Eaton, Hutt, Parker, T. B.
July 15	Durham	County Home	Roberts, Blackford, Parker, T. B
Feb. 1	Edgecombe	Tarboro	Eaton, Newell, Parker, T. B.
Feb. 2	Edgecombe	Conetoe	Eaton, Newell, Parker, T. B.
Aug. 23	Edgecombe	Test Farm	Kilgore, Chrisman, Shaw, Scarboro Parker, T. B.
Aug. 24	Edgecombe	Speed	Kilgore, Chrisman, Shaw, Scarboro Parker, T. B.
July 16	Forsyth	Kernersville	Burgess, Wood, Shaw.
July 18	Forsyth	Clemmons	Burgess, Wood, Shaw.
July 23	Forsyth	Winston-Salem	Roberts, Blackford, Parker, T. F
July 30	Forsyth	Tobaccoville	Roberts, Blackford, Parker, T. F
Feb. 4	Franklin	Louisburg	Burgess, Shaw.
Feb. 5	Franklin	Franklinton	Burgess, Shaw.
Jan. 28	Gates	Gatesville	Sherman, Chrisman, Newell
July 28	Gaston	Mount Holly	French, Millsaps, Jeffrey.
Aug. 2	Gaston	Cherryville	French, Millsaps, Jeffrey.
Aug. 2	Gaston	Gastonia	Scott, Conover.
July 28	Graham	Robbinsville	Sherman, Cannon, Roberts.
July 13	Granville	Oxford	Roberts, Blackford, Parker, T. F
July 14	Granville	Creedmoor	Roberts, Blackford, Parker, T. F
Jan. 18	Greene	Snow Hill	Eaton, Hutt, Parker, T. B

FARMERS' INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State.
July 15	Guilford	McLeansburg	Burgess, Wood, Shaw.
July 21	Guilford	Battleground	Roberts, Blackford, Parker, T. F.
Aug. 6	Guilford	Pleasant Garden	Burgess, Chrisman, Shaw.
Aug. 5	Guilford	Jamestown	Burgess, Chrisman, Shaw.
Feb. 1	Halifax	Scotland Neck	Sherman, Chrisman, Hutt.
Feb. 3	Halifax	Halifax	Sherman, Chrisman, Hutt.
Jan. 10	Harnett	Lillington	Burgess, Shaw, Searboro.
Oct. 1	Harnett	Rock Branch	Burgess, Shaw, Parker, T. B.
July 26	Haywood	Bethel Academy	Sherman, Cannon, Roberts.
July 27	Haywood	Clyde	Sherman, Cannon, Roberts.
Aug. 9	Haywood	Dellwood	Roberts, Millsaps, Miller.
Aug. 10	Haywood	Waynesville	Roberts, Millsaps, Miller.
Mar. 12	Henderson	Dana	Parker, Shaw.
July 19	Henderson	Mills River	Sherman, Cannon, Robinson.
Jan. 27	Hertford	Ahoskie	Sherman, Chrisman, Newell.
Jan. 29	Hertford	Murfreesboro	Sherman, Chrisman, Newell.
Jan. 13	Hyde	Middletown	Sherman, Chrisman, Newell.
Jan. 14	Hyde	Fairfield	Sherman, Chrisman, Newell.
Jan. 15	Hyde	Swan Quarter	Sherman, Chrisman, Newell.
July 21	Iredell	Mooresville	Burgess, Chrisman, Shaw.
July 26	Iredell	Statesville	Burgess, Chrisman, Shaw.
Aug. 12	Iredell	Net	Roberts, Robinson, Parker, T. F.
Aug. 13	Iredell	Eupeptic Springs	Roberts, Robinson, Parker, T. F.
Aug. 16	Iredell	Cool Springs	Roberts, Robinson, Parker, T. F.
Aug. 8	Jackson	Dillsboro	Roberts, Millsaps, Miller.
Jan. 10	Johnston	Smithfield	Hutt, Eaton, Parker, T. B.
Aug. 25	Johnston	Price's Schoolhouse	Chrisman, Parker, T. B.
Jan. 24	Jones	Maysville	Hutt, Eaton, Parker, T. B.
July 13	Lee	Lee Courthouse	Newman, French, Jeffrey.
Jan. 19	Lenoir	Kinston	Hutt, Eaton, Parker, T. B.
July 29	Lincoln	Iron Station	French, Millsaps, Jeffrey.
Aug. 1	Lincoln	Lincolnton	French, Jeffrey, Parker, T. B.
Aug. 5	Lincoln	Denver	Scott, Conover.
Aug. 6	Macon	Franklin	Cannon, Roberts, Miller.
July 22	Madison	Mars Hill	Sherman, Cannon, Robinson.
July 23	Madison	Chapel Hill	Sherman, Cannon, Robinson.
Feb. 2	Martin	Willliamston	Sherman, Chrisman, Hutt.
Aug. 6	McDowell	Marion	French, Jeffrey, Parker, T. B.
July 22	Mecklenburg	Derita	Burgess, Chrisman, Shaw.

FARMERS' INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State.
July 23	Mecklenburg	Griffith	Burgess, Chrisman, Shaw
July 25	Mecklenburg	Huntersville	Burgess, Chrisman, Shaw
July 26	Mecklenburg	Matthews	French, Millsaps, Jeffrey.
July 27	Mecklenburg	Oakdale	French, Millsaps, Jeffrey.
July 29	Mecklenburg	Shopton	Scott, Conover.
July 30	Mecklenburg	Arlington	Scott, Conover.
Aug. 1	Mecklenburg	Capps Schoolhouse	Scott, Conover.
Aug. 8	Mitchell	Spruce Pine	French, Jeffrey, Parker, T. B.
Aug. 9	Mitchell	Bakersville	French, Jeffrey, Parker, T. B.
July 21	Montgomery	Star	Scott, Conover.
July 23	Montgomery	Troy	Scott, Conover.
July 14	Moore	Cameron	Newman, French, Jeffrey.
July 15	Moore	Aberdeen	Newman, French, Jeffrey.
July 19	Moore	Carthage	Scott, Conover.
July 22	Moore	Elise	Scott, Conover.
Feb. 3	Nash	Nashville	Eaton, Newell, Parker, T. B.
Jan. 26	New Hanover	Castle Hayne	Burgess, Shaw, Scarboro.
Feb. 4	Northampton	Jackson	Sherman, Chrisman, Hutt.
Jan. 31	Northampton	Rich Square	Sherman, Chrisman, Newell.
Jan. 20	Onslow	Richlands	Hutt, Eaton, Parker, T. B.
Jan. 22	Onslow	Jacksonville	Hutt, Eaton, Parker, T. B.
July 14	Orange	Cedar Grove	Burgess, Wood, Shaw.
Aug. 13	Orange	Orange Grove	Burgess, Wood, Shaw.
Jan. 25	Pamlico	Bayboro	Hutt, Eaton, Parker, T. B.
Jan. 11	Pasquotank	Elizabeth City	Sherman, Chrisman, Newell.
July 16	Person	Roxboro	Roberts, Blackford, Parker, T. F.
Jan. 27	Pender	Atkinson	Burgess, Shaw, Scarboro.
Jan. 28	Pender	Burgaw	Burgess, Shaw, Scarboro.
Jan. 10	Perquimans	Hertford	Sherman, Chrisman, Newell.
Jan. 28	Pitt	Farmville	Hutt, Eaton, Parker, T. B.
Jan. 29	Pitt	Greenville	Hutt, Eaton, Parker, T. B.
July 21	Polk	Columbus	Sherman, Cannon, Robinson.
Aug. 9	Randolph	Ramseur	Scott, Conover.
Aug. 10	Randolph	Randleman	Scott, Conover.
Aug. 11	Randolph	Ashboro	Scott, Conover.
Aug. 12	Randolph	Farmer	Scott, Conover.
Aug. 10	Randolph	Liberty	Burgess, Chrisman, Shaw.
July 16	Richmond	Hoffman	Newman, French, Jeffrey.
July 18	Richmond	Rockingham	Newman, French, Jeffrey.
Jan. 12	Robeson	Parkton	Burgess, Shaw, Scarboro.

FARMERS' INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State.
Sept. 16-17.	Robeson	Philadelphus	Kilgore, Sherman, Chrisman, Parker, T. B.
Jan. 13	Robeson	Rowland	Burgess, Shaw, Scarboro.
July 20	Rockingham	Lawsonville	Roberts, Blackford, Parker, T. F.
July 22	Rockingham	Sylvania Schoolhouse	Roberts, Blackford, Parker, T. F
July 20	Rowan	Mount Ulla	Burgess, Chrisman, Shaw.
July 27	Rowan	Salisbury	Scott, Conover.
Aug. 2	Rowan	China Grove	Burgess, Wood, Shaw.
Aug. 3	Rutherford	Ellenboro	French, Jeffrey, Parker, T. B
Aug. 4	Rutherford	Rutherfordton	French, Jeffrey, Parker, T. B
Aug. 5	Rutherford	Thermal City	French, Jeffrey, Parker, T. B
Jan. 14	Sampson	Clinton	Hutt, Eaton, Parker, T. B.
Jan. 17	Sampson	Delway	Hutt, Eaton, Parker, T. B.
Jan. 14	Scotland	Laurinburg	Burgess, Shaw, Scarboro.
July 25	Stanly	Norwood	Scott, Conover.
July 26	Stanly	Albemarle	Scott, Conover.
July 27	Stokes	Danbury	Stevens, Blackford, Parker, T. F.
July 28	Surry	Pilot Mountain	Stevens, Blackford, Parker, T. F. and T. B.
July 29	Surry	Mount Airy	Stevens, Blackford, Parker, T. F. and T. B.
Aug. 4	Surry	Rocky Ford Schoolhouse	Stevens, Blackford, Parker, T. F.
Aug. 3	Swain	Almond	Cannon, Roberts.
Aug. 4	Swain	Bryson City	Cannon, Roberts.
July 20	Transylvania	Brevard	Sherman, Cannon, Robinson.
Jan. 22	Tyrrell	Columbia	Sherman, Chrisman, Newell.
July 22	Union	Marshville	Newman, French, Jeffrey.
July 23	Union	Waxhaw	Newman, French, Jeffrey.
July 25	Union	Monroe	Newman, Millsaps.
Feb. 3	Vance	Bear Pond Schoolhouse	Burgess, Shaw.
Feb. 2	Vance	Middleburg	Burgess, Shaw.
Aug. 30-Sept. 1	Wake	West Raleigh	Round-up Institute.
Sept. 9	Wake	Green Level	Parker, T. B., Chrisman, Parker, T. F
Feb. 1	Warren	Warrenton	Burgess, Shaw.
Jan. 24	Washington	Creswell	Sherman, Chrisman, Newell.
Jan. 25	Washington	Plymouth	Sherman, Chrisman, Newell.
Aug. 8	Watauga	Boone	Stevens, Parker, T. F.
Jan. 11	Wayne	Casey's Schoolhouse	Hutt, Eaton, Parker, T. B.
Jan. 12	Wayne	Pinkney	Hutt, Eaton, Parker, T. B.
Aug. 1	Wilkes	Wilkesboro	Stevens, Parker, T. F., Blackford
Jan. 31	Wilson	Wilson	Hutt, Eaton, Parker, T. B.
Aug. 2	Yadkin	Yadkinville	Stevens, Blackford, Parker, T. F.
Aug. 3	Yadkin	East Bend	Stevens, Parker, T. F.
Aug. 10	Yancey	Burnsville	French, Jeffrey, Parker, T. B

COUNTY AND LOCAL MEN'S ORGANIZATIONS.

There are farmers' institute committees in all the counties in which institutes are held. These committees are very helpful in the work by suggesting places and subjects for the institutes, advertising the meetings in local papers, and otherwise. A live chairman with a good committee to assist him is necessary in every county where an institute is to be held. I have found also that farmers' clubs, local alliances and local farmers unions can greatly assist in institute work by co-operating with the institute committees and the director of farmers' institutes. I shall very much appreciate the co-operation of all such organizations.

CHAIRMEN OF LOCAL AND COUNTY FARMERS' INSTITUTE COMMITTEES.

County.	Chairman of Committee.	Post-office.
Alamance	Chas. F. Cates	Mebane.
Alexander	J. N. Smith	Taylorsville.
Alleghany	S. F. Thompson	Walls.
Anson	W. J. McLendon	Wadesboro.
Ashe	John Dent	Jefferson.
Beaufort	W. D. Grimes	Washington.
Bertie	C. W. Spruill	Quitsna.
Bladen	R. B. Cromartie	Elizabethtown.
White Oak	N. A. Layton	White Oak.
Brunswick	Jack Johnson	Winnabow.
Supply	W. Sellers	Supply.
Shallotte	E. M. Parker	Shallotte.
Ash	R. M. Lang	Ash.
Buncombe	R. P. Hayes	Asheville.
Leicester	A. J. Merrill	Leicester.
Burke	T. W. Drewry	Morganton, R. F. D. 5.
Connelly Springs	J. E. Coulter	Connelly Springs.
Cabarrus	A. H. Litaker	Concord, R. F. D. 5.
Caldwell	George Goforth	Lenoir.
Camden	W. G. Ferebee	Gregory.
Caswell	T. P. Womack	Yanceyville
Leasburg	E. W. Lee	Leasburg.
Catawba	John W. Robinson	Newton.
Newton	C. E. Smyre	Newton.
Sherrills Ford	C. M. Beatty	Sherrills Ford.
Chatham	J. A. Perley	Pittsboro.

CHAIRMEN OF LOCAL AND COUNTY FARMERS' INSTITUTE COMMITTEES—Continued

County.	Chairman of Committee.	Post-office.
Cherokee	R. R. Beal	Murphy.
Andrews	W. P. Walker	Andrews.
Chowan	Z. W. Evans	Tyner.
Clay	W. T. Bumgarner	Hayesville.
Brasstown	R. L. Johnston	Brasstown.
Cleveland	A. A. Warlick	Casar.
Columbus	D. Boughner	Chadbourn.
Tabor	Minos Meares	Tabor.
Whiteville	Dr. W. Ross Davis	Whiteville.
Craven	W. H. Bray	New Bern.
Cumberland	Cyrus Murphy	Fayetteville.
Raeford	McLean Campbell	Raeford.
Currituck	J. J. Ferebee	Shawboro.
Davidson	P. J. Leonard	Lexington
Denton	H. M. Skeen	Denton.
Thomasville	J. W. Lambeth	Thomasville.
Davie	S. A. Woodruff	Mocksville.
Duplin	J. A. Shine	Faison.
Calypso	J. T. Albritton	Mount Olive.
Rose Hill	Maury Ward	Rose Hill.
Durham	E. J. Parrish	Durham.
Edgecombe	G. T. DeBerry	Tarboro.
Conetoe	N. B. Dawson	Conetoe.
Forsyth	A. B. Atwood	Winston-Salem.
Clemmons	T. W. Griffith	Clemmons.
Kernersville	N. H. Smith	Kernersville.
Rural Hall	L. A. Strupe	Tobaccoville.
Franklin	T. B. Wilder	Louisburg.
Franklinton	I. H. Kerney	Franklinton.
Gaston	J. Q. Rhyne	Lowell.
Gates	Lycurgus Hofler	Gatesville.
Graham	G. B. Walker	Robbinsville.
Granville	E. G. Moss	Creedmoor.
Greene	J. T. Frizzell	Snow Hill.
Grimsleys Church	J. T. Dixon	Farmville.
Guilford	J. Franklin Davis	Guilford College.
Gibsonville	W. C. Michall	Gibsonville.
Pleasant Garden	C. E. Hockart	Pleasant Garden.

CHAIRMEN OF LOCAL AND COUNTY FARMERS' INSTITUTE COMMITTEES—Continued

County.	Chairman of Committee.	Post-office.
Halifax	J. H. Sherrod	Enfield.
Scotland Neck	E. E. Hilliard	Scotland Neck.
Harnett	C. McArtan	Lillington.
Coats	T. D. Stewart	Coats.
Haywood	Dr. G. D. Green	Waynesville.
Canton	M. F. Albright	Canton.
Bethel	J. W. Moore	Waynesville, R. F. D. 3.
Dellwood	B. P. Howell	Waynesville, R. F. D. 2.
Henderson	J. P. Fletcher	Fletcher.
Hertford	W. P. Shaw	Winton.
Ahoskie	T. E. Browne	Ahoskie.
Hyde	Chas. Brim	Swan Quarter.
Middletown	J. S. Mann	Middletown.
Iredell	J. W. Sherrill	Statesville.
Mount Ulla	J. K. Goodman	Mount Ulla.
Eupeptic Springs	W. W. Holland	Charles.
Net	C. C. Tharpe	Net.
Cool Springs	W. F. Reeee	Statesville, R. F. D. 7.
Jackson	G. P. Miller	Sylva.
Johnston	W. M. Sanders	Smithfield.
Kenly	N. R. Pike	Bagley.
Benson	J. F. Lee	Benson.
Jones	J. C. Parker	Oliver.
Lee	W. I. Brooks	Jonesboro.
Lenoir	G. F. Loftin	Kinston.
Lincoln	H. S. Robinson	Lincolnton.
Bess' Chapel	C. W. Beam	Cherryville.
Denver	T. H. Proctor	Denver.
McDowell	Dr. R. J. Burgin	Marion.
Macon	Arthur Siler	Franklin.
Madison	J. F. Bryan	Marshall.
Mars Hill	A. F. Sprinkle	Mars Hill.
Martin	P. R. Rives	Robersonville, R. F. D. 1.
Mecklenburg	C. C. Moore	Charlotte.
Huntersville	J. R. Ewart	Huntersville.
Derita	B. J. Hunter	Derita.
Capps Schoolhouse	S. H. and R. N. Capps	Pineville, R. F. D. 15
Sharon	W. C. Clark	Charlotte, R. F. D. 1.

CHAIRMEN OF LOCAL AND COUNTY FARMERS' INSTITUTE COMMITTEES—Continued

County.	Chairman of Committee.	Post-office.
Mitchell	S. M. C. Green	Toecane.
Spruce Pine	L. A. Berry	Spruce Pine.
Montgomery	O. B. Deaton	Troy.
Elise	W. G. Carter	Carters Mills.
Mt. Gilead	R. A. Bruton	Mt. Gilead.
Star	J. L. Stewart	Star.
Moore	T. D. McLean	Carthage.
Nash	S. F. Austin	Nashville.
Stanhope High School.	S. H. Brantley	Springhope, R. F. D. 1.
Whitakers	M. J. Battle	Whitakers.
New Hanover	Wm. Gregerson	Wilmington, R. F. D. 1.
Northampton	J. W. Jessups	Rich Square.
Onslow	Dr. J. L. Nicholson	Richlands.
Orange	S. W. Andrews	Hillsboro.
Pamlico	O. J. Rock	Reelsboro.
Pasquotank	R. N. Morgan	Elizabeth City.
Pender	W. M. Hand	Burgaw.
Atkinson	S. J. Moore	Atkinson.
Perquimans	M. H. White	Hertford.
Person	J. A. Long	Roxboro.
Pitt	J. F. Evans	Greenville, R. F. D. 1.
Grimesland	Alston Grimes	Grimesland.
Polk	T. T. Ballinger	Tryon.
Randolph	E. J. Coltrane	Ashboro.
Richmond	W. C. Leak	Rockingham.
Robeson	E. F. McRea	Maxton.
Parkton	W. S. Cobb	Parkton.
Rockingham	J. V. Price	Madison.
Rowan	H. M. L. Agner	Salisbury.
China Grove	G. Hauck	China Grove.
Salisbury	R. L. Thomason	Salisbury.
Rutherford	W. K. McDowell	Island Ford.
Sampson	S. H. Hobbs	Clinton.
Newton Grove	J. W. Bryan	Newton Grove.
Spring Branch	E. A. Jackson	Cooper.
Scotland	W. N. McKenzie	Gibson.
Stanly	G. T. Dunlap	Norwood.
Stokes	I. G. Ross	Walnut Cove.

CHAIRMEN OF LOCAL AND COUNTY FARMERS' INSTITUTE COMMITTEES—Continued

County.	Chairman of Committee.	Post-office.
Surry	S. C. Franklin	Mount Airy.
Mount Airy	W. J. Herring	Mount Airy.
Swain	R. L. Sandidge	Bryson City
Transylvania	W. H. Grogan	Brevard.
Tyrrell	W. W. Sawyer	Columbia
Union	T. J. W. Broome	Monroe.
Vance	J. B. Allen	Henderson.
Middleburg	J. K. Plummer	Middleburg
Wake	W. B. Upchurch	Apex.
Warren	H. T. Macon	Warrenton.
Wise	P. R. Perkinson	Wise.
Washington	T. W. Blount	Roper.
Creswell	W. T. Hopkins	Creswell.
Watauga	T. C. Baird	Valle Cruces.
Wayne	H. D. Ham	Goldsboro, R. F. D. 5
Wilkes	J. G. Hackett	North Wilkesboro.
Wilson	A. B. Deans	Wilson.
Yadkin	John F. Long	Chestnut Ridge.
Yancey	W. B. Banks	Burnsville.

STATE FARMERS' CONVENTION.

State at Large	Frank Spruill, President	Scotland Neck
State at Large	Dr. A. S. Wheeler, Vice-President	Biltmore.
State at Large	I. O. Schaub, Secretary	West Raleigh.

WOMEN'S INSTITUTES, 1910.

There were more women's institutes held in the State during 1910 than were held in any two previous years since we began holding women's institutes. Our first women's institutes were held in 1906, when we held 21 institutes in 19 counties. In 1907 we held 50 in 38 counties; in 1908 68 were held in 46 counties; in 1909 73 were held in 51 counties; and this year we have held 173 in 84 counties. These institutes are held at the same places and on the same days the men's institutes are held, but in separate halls, except at a joint session, which is usually held during the day, when both men and women lecturers speak to the audience.

Women's institutes are growing in attendance and appreciation as their work is better understood by the public.

In this connection I wish to acknowledge my indebtedness to the State Board of Health for literature and other courtesies extended to the women's institutes.

The following is a partial list of the subjects discussed at these institutes:

What to Eat and How to Prepare It.
Suggestions in Household Work.
Friends and Foes of Housekeepers.
The Influence of the Woman in the Home.
Foods, Their Cooking and Use.
Home Nursing.
The Farm Fruit and Vegetable Garden.
Farm Poultry.
Butter-making on the Farm.
Home Conveniences.
Literature in the Home.
Home Sanitation.
Educating the Girls on the Farm.
Hookworm.
Preventable Diseases.
Insect Pests, etc.

WOMEN'S INSTITUTES, 1910.

Date.	County.	Location.	Lecturers Supplied by the State.
Aug. 11	Alamance	Elon College	Miss M. L. Jamison
Aug. 12	Alamance	Mebane	Miss M. L. Jamison
Aug. 5	Alleghany	Sparta	Mrs. F. L. Stevens.
July 19	Anson	Morven	Mrs. Hollowell, Miss L. H. Jamison.
July 21	Anson	Peachland	Mrs. Hollowell, Miss L. H. Jamison.
July 20	Anson	Wadesboro	Mrs. Hollowell, Miss L. H. Jamison.
Aug. 6	Ashe	Jefferson	Mrs. F. L. Stevens.
Jan. 26	Bertie	Windsor	Mrs. W. N. Hutt.
Jan. 17	Bladen	Councils	Mrs. Stevens.
Jan. 15	Bladen	White Oak	Mrs. Stevens.
Jan. 21	Brunswick	Ashe	Mrs. Stevens.
Jan. 22	Brunswick	Shallotte	Mrs. Stevens.
Jan. 24	Brunswick	Supply	Mrs. Stevens.
Jan. 25	Brunswick	Bolivia	Mrs. Stevens.
Aug. 11	Buncombe	Swannanoa	Mrs. Hutt, Mrs. Hollowell
July 28	Burke	Morganton	Miss M. L. Jamison.
July 29	Burke	Connelly Springs	Miss M. L. Jamison.
July 28	Cabarrus	Mount Pleasant	Miss Scott, Miss Reinhardt.
July 30	Cabarrus	Concord	Miss M. L. Jamison.
Aug. 1	Cabarrus	Harrisburg	Miss M. L. Jamison.
Aug. 9	Caldwell	Yadkin Valley	Mrs. Stevens.
Aug. 10	Caldwell	Lenoir	Mrs. Stevens.
Aug. 11	Caldwell	Granite Falls	Mrs. Stevens.
Jan. 18	Camden	Camden Courthouse	Mrs. Hutt.
July 18	Caswell	Leasburg	Mrs. Stevens.
July 19	Caswell	Locust Hill	Mrs. Stevens.
Aug. 3	Catawba	Ford's Store	Misses Scott and Reinhardt.
Aug. 4	Catawba	Sherrills Ford	Misses Scott and Reinhardt.
July 27	Catawba	Newton	Misses Scott and Reinhardt.
July 12	Chatham	Pittsboro	Mrs. Hollowell, Miss Jamison.
Aug. 8	Chatham	Goldston	Miss M. L. Jamison.
Aug. 9	Chatham	Siler City	Miss M. L. Jamison.
Jan. 20	Chowan	Edenton	Mrs. Hutt.
Aug. 1	Clay	Hayesville	Mrs. Hutt, Mrs. Hollowell.
Aug. 2	Clay	Brasstown	Mrs. Hutt, Mrs. Hollowell.
July 30	Cleveland	Shelby	Miss L. H. Jamison.
Aug. 6	Cleveland	Casar	Miss Scott, Miss Reinhardt.
Jan. 18	Columbus	Chadbourn	Mrs. Stevens.
Jan. 19	Columbus	Mount Tabor	Mrs. Stevens.

WOMEN'S INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State
Jan. 20	Columbus	Old Dock	Mrs. Stevens.
Jan. 11	Cumberland	Fayetteville	Mrs. Stevens.
July 20	Cumberland	Raeford	Misses Scott and Reinhardt
Jan. 19	Currituck	Currituck Courthouse	Mrs. Hutt.
July 25	Davidson	Enterprise	Mrs. Stevens.
July 26	Davidson	Wallburg	Mrs. Stevens.
Aug. 3	Davidson	Linwood	Miss M. L. Jamison.
Aug. 4	Davidson	Thomasville	Miss M. L. Jamison.
Aug. 8	Davidson	Reeds	Misses Scott and Jamison.
Aug. 13	Davidson	Denton	Misses Scott and Jamison.
Jan. 13	Duplin	Calypso	Mrs. Hollowell.
Jan. 16	Duplin	Rose Hill	Mrs. Sue V. Hollowell.
July 15	Durham	County Home	Mrs. Stevens.
Aug. 23	Edgecombe	Test Farm	Mrs. Hollowell, Mrs. Hutt.
Aug. 24	Edgecombe	Speed	Mrs. Hollowell, Mrs. Hutt.
July 16	Forsyth	Kernersville	Mrs. Hutt, Miss M. L. Jamison
July 18	Forsyth	Clemmons	Mrs. Hutt, Miss M. L. Jamison
July 23	Forsyth	Winston-Salem	Mrs. Stevens.
July 30	Forsyth	Tobaccoville	Mrs. Stevens.
Feb. 4	Franklin	Louisburg	Mrs. Stevens.
Feb. 5	Franklin	Franklinton	Mrs. Stevens.
Jan. 28	Gates	Gatesville	Mrs. Hutt.
July 28	Gaston	Mount Holly	Miss L. H. Jamison.
Aug. 2	Gaston	Cherryville	Miss L. H. Jamison.
Aug. 2	Gaston	Gastonia	Misses Scott and Reinhardt
July 13	Granville	Oxford	Mrs. Stevens.
July 14	Granville	Creedmoor	Mrs. Stevens.
Jan. 18	Greene	Snow Hill	Mrs. Hollowell.
July 15	Guilford	McLeansburg	Mrs. Hutt, Miss M. L. Jamison
July 21	Guilford	Battleground	Mrs. Stevens.
Aug. 5	Guilford	Jamestown	Miss M. L. Jamison.
Aug. 6	Guilford	Pleasant Garden	Miss M. L. Jamison.
Feb. 1	Halifax	Scotland Neck	Mrs. Hutt.
Feb. 3	Halifax	Halifax	Mrs. Hutt.
Jan. 10	Harnett	Lillington	Mrs. Stevens.
Oct. 1	Harnett	Rock Branch	Mrs. Stevens.
Aug. 9	Haywood	Dellwood	Mrs. Hutt, Mrs. Hollowell
Aug. 10	Haywood	Waynesville	Mrs. Hutt, Mrs. Hollowell.
Jan. 27	Hertford	Ahoskie	Mrs. Hutt.

WOMEN'S INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State.
Jan. 29	Hertford	Murfreesboro	Mrs. Hutt.
Jan. 13	Hyde	Middletown	Mrs. Hutt.
Jan. 14	Hyde	Fairfield	Mrs. Hutt.
Jan. 15	Hyde	Swan Quarter	Mrs. Hutt.
July 21	Iredell	Mooresville	Mrs. Hutt and Miss M. L. Jamison
July 26	Iredell	Statesville	Mrs. Hutt and Miss M. L. Jamison
Aug. 8	Jackson	Dillsboro	Mrs. Hutt and Mrs. Hollowell.
Jan. 10	Johnston	Smithfield	Mrs. Sue V. Hollowell.
Aug. 25	Johnston	Price's Schoolhouse	Mrs. McKimmon.
Jan. 24	Jones	Maysville	Mrs. Hollowell.
July 13	Lee	Lee Courthouse	Mrs. Hollowell and Miss L. H. Jamison
Jan. 19	Lenoir	Kinston	Mrs. Hollowell.
July 29	Lincoln	Iron Station	Miss L. H. Jamison.
Aug. 1	Lincoln	Lincolnton	Miss L. H. Jamison.
Aug. 5	Lincoln	Denver	Misses Scott and Reinhardt.
Aug. 6	Macon	Franklin	Mrs. Hutt, Mrs. Hollowell.
Aug. 6	McDowell	Marion	Miss L. H. Jamison.
July 22	Mecklenburg	Derita	Miss M. L. Jamison, Mrs. Hutt.
July 23	Mecklenburg	Griffith	Miss M. L. Jamison, Mrs. Hutt.
July 25	Mecklenburg	Huntersville	Miss M. L. Jamison, Mrs. Hutt.
July 26	Mecklenburg	Matthews	Miss L. H. Jamison.
July 27	Mecklenburg	Oakdale	Miss L. H. Jamison.
July 28	Mecklenburg	Shopton	Misses Scott and Reinhardt.
July 30	Mecklenburg	Arlington	Misses Scott and Reinhardt.
Aug. 1	Mecklenburg	Capps Schoolhouse	Misses Scott and Reinhardt.
Aug. 8	Mitchell	Spruce Pines	Miss L. H. Jamison.
Aug. 9	Mitchell	Bakersville	Miss L. H. Jamison.
July 21	Montgomery	Star	Misses Scott and Reinhardt.
July 23	Montgomery	Troy	Misses Scott and Reinhardt.
July 14	Moore	Cameron	Mrs. Hollowell, Miss L. H. Jamison
July 15	Moore	Aberdeen	Mrs. Hollowell, Miss L. H. Jamison.
July 19	Moore	Carthage	Miss Scott, Miss Reinhardt.
July 22	Moore	Elise	Miss Scott, Miss Reinhardt.
Jan. 26	New Hanover	Castle Hayne	Mrs. Stevens.
Jan. 31	Northampton	Rich Square	Mrs. Hutt.
Feb. 4	Northampton	Jackson	Mrs. Hutt.
Jan. 20	Onslow	Richlands	Mrs. Hollowell.
Jan. 22	Onslow	Jacksonville	Mrs. Hollowell.
July 14	Orange	Cedar Grove	Mrs. Hutt, Miss M. L. Jamison.

WOMEN'S INSTITUTES—Continued.

Date.	County.	Location.	Lecturers Supplied by the State.
Aug. 13	Orange	Orange Grove	Mrs. Hutt, Miss M. L. Jamison
Jan. 11	Pasquotank	Elizabeth City	Mrs. Hutt.
July 16	Person	Roxboro	Mrs. Stevens.
Jan. 27	Pender	Atkinson	Mrs. Stevens.
Jan. 28	Pender	Burgaw	Mrs. Stevens.
Jan. 10	Perquimans	Hertford	Mrs. Hutt.
Aug. 9	Randolph	Ramseur	Miss Scott, Miss Reinhardt.
Aug. 10	Randolph	Randleman	Miss Scott, Miss Reinhardt
Aug. 10	Randolph	Liberty	Miss M. L. Jamison.
Aug. 11	Randolph	Ashboro	Miss Scott, Miss Reinhardt.
Aug. 12	Randolph	Farmer	Miss Scott, Miss Reinhardt.
July 16	Richmond	Hoffman	Mrs. Hollowell, Miss L. H. Jamison.
July 18	Richmond	Rockingham	Mrs. Hollowell, Miss L. H. Jamison.
Jan. 12	Robeson	Parkton	Mrs. Stevens.
Jan. 13	Robeson	Rowland	Mrs. Stevens.
Sept. 16–17	Robeson	Philadelphus	Miss Bates, Mrs. Stevens, Mrs. McKimmon.
July 20	Rockingham	Lawsonville	Mrs. Stevens.
July 22	Rockingham	Sylvania Schoolhouse	Mrs. Stevens.
July 20	Rowan	Mount Ulla	Mrs. Hutt, Miss M. L. Jamison.
July 27	Rowan	Salisbury	Miss Scott, Miss Reinhardt.
Aug. 2	Rowan	China Grove	Miss M. L. Jamison.
Aug. 3	Rutherford	Ellenboro	Miss L. H. Jamison.
Aug. 4	Rutherford	Rutherfordton	Miss L. H. Jamison.
Aug. 5	Rutherford	Thermal City	Miss L. H. Jamison.
Jan 14	Sampson	Clinton	Mrs. Hollowell.
Jan. 17	Sampson	Delway	Mrs. Hollowell.
Jan. 14	Scotland	Laurinburg	Mrs. Stevens.
July 25	Stanly	Norwood	Miss Scott, Miss Reinhardt.
July 26	Stanly	Albemarle	Miss Scott, Miss Reinhardt
July 27	Stokes	Danbury	Mrs. Stevens.
July 28	Surry	Pilot Mountain	Mrs. Stevens.
July 29	Surry	Mount Airy	Mrs. Stevens.
Aug. 4	Surry	Rocky Ford Schoolhouse	Mrs. Stevens.
Aug. 2	Swain	Almond	Mrs. Hutt, Mrs. Hollowell.
Aug. 4	Swain	Bryson City	Mrs. Hutt, Mrs. Hollowell.
Jan. 22	Tyrrell	Columbia	Mrs. Hutt.
July 22	Union	Marshville	Mrs. Hollowell, Miss L. H. Jamison.
July 23	Union	Waxhaw	Mrs. Hollowell, Miss L. H. Jamison.
July 25	Union	Monroe	Miss L. H. Jamison.

WOMEN'S INSTITUTES—Continued

Date.		County	Location	Lecturers Supplied by the State
Feb.	2	Vance	Middleburg	Mrs. Stevens
Feb.	3	Vance	Bear Pond Schoolhouse	Mrs. Stevens
Sept.	9	Wake	Green Level	Mrs. Stevens, Miss Bates
Feb.	1	Warren	Warrenton	Mrs. Stevens
Jan.	24	Washington	Creswell	Mrs. Hutt
Jan.	25	Washington	Plymouth	Mrs. Hutt
Aug.	8	Watauga	Boone	Mrs. Stevens.
Jan.	11	Wayne	Casey's Schoolhouse	Mrs. Hollowell
Jan.	12	Wayne	Pinkney	Mrs. Hollowell
Aug.	1	Wilkes	Wilkesboro	Mrs. Stevens
Aug.	2	Yadkin	Yadkinville	Mrs. Stevens.
Aug.	10	Yancey	Burnsville	Miss L. H. Jamison

COUNTY AND LOCAL WOMEN'S ORGANIZATIONS.

The plan of organization of the women's institutes is the same as for men. A live, interested woman is selected for chairman, and she is given the assistance of the best committee that can be selected for that purpose.

CHAIRMEN OF COUNTY AND LOCAL WOMEN'S INSTITUTE COMMITTEES.

County.	Chairman of Committee.	Post-office.
Alamance	Mrs. Robt. Scott	Haw River.
Alexander	Mrs. J. T. Rowland	Taylorsville.
Alleghany	Mrs. T. J. Carson	Sparta.
Anson	Mrs. J. G. Boylin	Wadesboro.
Ashe	Mrs. W. H. Garven	Jefferson.
Bertie	Mrs. E. L. Gatling	Windsor.
Bladen	Mrs. Nicie Powell	Bladenboro
Buncombe	Mrs. R. S. Thrash	Asheville.
Burke	Mrs. W. B. Berry	Morganton.
Burke	Mrs. Henderson Berry (Hickory)	Connelly Springs
Cabarrus	Mrs. Missouri Brown	Concord.
Caldwell	Mrs. Amelia Coles	Lenoir.
Camden	Mrs. E. I. Sawyer	
Caswell	Mrs. S. P. Newman	Leasburg.
Caswell	Mrs. T. P. Womack (Locust Hill)	Yanceyville.
Catawba	Mrs. R. O. Ramseur	Hickory.
Catawba	Mrs. C. E. Snyre	Newton.
Chatham	Mrs. D. S. Webster	Siler City, R. F. D 1
Chatham	Mrs. O. M. Dorsett (Goldston)	Goldston.
Chatham	Mrs. C. E. Duncan (Liberty)	Liberty.
Chowan	Mrs. D. G. Bond	Edenton.
Cleveland	Mrs. Frank Elam	Cleveland Springs
Cleveland	Mrs. Sam Wallick (Casar)	Casar.
Columbus	Mrs. E. H. Miller	Chadbourn.
Cumberland	Mrs. J. H. Currie	Fayetteville.
Cumberland	Mrs. A. W. McIntyre (Raeford)	Raeford.
Currituck	Miss Nettie Dozier	Coinjock.
Davidson	Mrs. Alda Craver (R. F. D. 3)	Lexington.
Davidson	Miss Carrie Beall (Enterprise)	Linwood.
Davidson	Mrs. L. E. Byrd (Linwood)	Thomasville.
Duplin	Mrs. Hettie Barbee (Calypso)	Calypso.
Duplin	Mrs. P. C. Fussell (Rose Hill)	Rose Hill.
Durham	Mrs. S. M. Smith, R. F. D. 4	Durham.

CHAIRMEN OF COUNTY AND LOCAL WOMEN'S INSTITUTE COMMITTEES—Continued.

County.	Chairman of Committee.	Post-office.
Forsyth	Mrs. J. R. Snyder, R. F. D. 4	Winston-Salem.
Forsyth	Mrs. M. S. Vogler (Tobaccoville)	Tobaccoville.
Franklin	Mrs. W. J. Strickland (Louisburg)	Katesville.
Franklin	Mrs. J. H. McGee (Franklinton)	Franklinton
Gaston	Mrs. Martin Rudisville	Cherryville.
Granville	Mrs. M. E. Eakes, R. F. D. 2	Oxford.
Granville	Mrs. S. A. Fleming (Creedmoor)	Hester.
Guilford	Mrs. Thomas Harden	Greensboro.
Guilford	Mrs. J. R. Gordon (Jamestown)	Jamestown.
Guilford	Mrs. W. H. Vickery (Pleasant Garden)	Greensboro, R. F. D. 1
Halifax	Mrs. W. L. Wiggins	Littleton.
Harnett	Mrs. S. H. Washburn	Lillington.
Iredell	Mrs. R. W. Orr	Statesville.
Jackson	Mrs. E. G. McKee	Sylva.
Johnston	Mrs. D. J. Wellons	Smithfield.
Johnston	Mrs. R. H. Gower	Clayton.
Lee	Mrs. J. H. Henly	Sanford.
Lenoir	Mrs. B. L. Elmore	Kinston.
Lincoln	Mrs. Chas. Lee Hoover	Lincolnton.
Lincoln	Mrs. Mary Ward (Cid)	Cid.
Lincoln	Mrs. W. E. Long	Stanly.
McDowell	Mrs. J. C. Crawford	Sugar Hill.
Martin	Mrs. W. T. Taylor	Robersonville.
Mecklenburg	Mrs. H. Howland	Charlotte.
Mecklenburg	Mrs. J. A. Stevens (Matthews)	Matthews.
Montgomery	Mrs. R. L. E. McIntosh	Martins' Mill.
Montgomery	Mrs. W. G. Carter (Carters Mill)	Carters Mill.
Montgomery	Mrs. L. P. Byrd (Mount Gilead)	Mount Gilead.
Moore	Mrs. H. F. Seawell	Carthage.
Onslow	Mrs. J. E. Rhodes	Richlands.
Orange	Mrs. H. D. Woods	Cedar Grove.
Pamlico	Mrs. G. T. Farnell	Bayboro.
Pasquotank	Mrs. R. N. Morgan	Elizabeth City.
Perquimans	Mrs. Carrie Perry	Belvidere.
Person	Mrs. N. B. Davis, R. F. D. 2	Roxboro.
Randolph	Mrs. M. J. Caviness	Ramseur.
Randolph	Mrs. J. H. Kearns (Farmer)	Farmer.
Richmond	Mrs. W. R. Coppedge	Rockingham.
Robeson	Mrs. W. C. Hamer	Maxton.

CHAIRMEN OF COUNTY AND LOCAL WOMEN'S INSTITUTE COMMITTEES—Continued.

County.	Chairman of Committee.	Post-office.
Rockingham	Mrs. R. H. Johnston, R. F. D. 5	Reidsville.
Rockingham	Mrs. W. T. Southern (Stokesdale)	Stokesdale.
Rowan	Miss Effie Cress (China Grove)	Salisbury, R. F. D 2
Rutherford	Mrs. H. S. Toms	Rutherfordton.
Sampson	Mrs. L. C. Daily	Ellenboro.
Scotland	Mrs. A. McNeil	Laurinburg
Stanly	Mrs. M. E. Blaylock	Norwood.
Stokes	Mrs. J. W. Neal	Walnut Cove.
Surry	Mrs. G. N. Vaughan	Pilot Mountain
Swain	Mrs. A. M. Fry	Bryson City.
Tyrrell	Mrs. C. W. Swain	Jerry.
Union	Miss A. Broadway (Marshville)	Marshville.
Union	Miss E. Richardson (Waxhaw)	Waxhaw.
Vance	Miss Nettie M. Allen	Henderson.
Wake	Mrs. W. G. Clements	Morrisville.
Warren	Mrs. R. L. Pinnell	Warrenton.
Washington	Mrs. B. F. Spruill	Creswell.
Watauga	Mrs. B. J. Council	Boone.
Wayne	Mrs. H. H. Overman (Eureka)	Eureka
Wayne	Miss Mary Pearson (Rosewood)	Rosewood.
Wilkes	Miss Mattie Ferguson	Boomer.
Yadkin	Mrs. Rose Shugart	Yadkinville.

DEMONSTRATION RAILWAY CARS.

DEMONSTRATION RAILWAY CARS.

For the past two years the State Department of Agriculture has been operating demonstration trains for institute work. These trains have been generously furnished by the Seaboard Air Line and Southern Railways. During the past summer fifty of these demonstration train institutes were held. The trains consisted of a passenger coach fitted up with an oil stove, kitchen cabinet, sink, ice box, together with cooking utensils of modern design, intended to lighten women's work in the kitchen, and a baggage or express car containing improved farm implements of various kinds. In the passenger coach the women held their meetings, delivered lectures and demonstrated the use of the various cooking utensils, served lunches, etc. A competent person was in charge of the implement car to give information and explain the workings of the various implements in the car.

These implements were furnished by the following manufacturers and dealers, to whom I advise interested persons to write. I consider them perfectly reliable:

Bateman Manufacturing Company, Grenloch, N. J. Agricultural Implements, Riding Cultivators, Garden Plows.

Raney Canning Company, Chapel Hill, N. C. Canning Outfit.

Home Canning Company, Hickory, N. C. Canning Outfit.

Standard Oil Company, Baltimore, Md. Oil Stoves, Heaters and Lamps.

Job P. Wyatt & Sons, Raleigh, N. C. Agricultural Implements. Incubators, Brooders, Stalk Choppers, etc.

G. L. Vinson, Raleigh, N. C. Kitchen Sinks, etc.

Royall & Borden Company, Raleigh, N. C. Kitchen Cabinets, etc.

Western Implement Company, Port Washington, Wis. Riding Plow Attachment.

Perfection Wheat Cleaner Company, Lexington, N. C. Seed Wheat Cleaner.

J. K. Goodman, Mt. Ulla, N. C. Combined Stalk Chopper and Land Roller.

W. A. Myatt, Raleigh, N. C. Corn and Cotton Planters, Agricultural Implements.

S. W. Brewer, Raleigh, N. C. Cream Separators, Mowers, Agricultural Implements.

Wm. Campbell & Co., Detroit, Mich. Fireless Cookers.

Manson-Campbell Company, Detroit, Mich. Fireless Cookers.

ORCHARD DEMONSTRATIONS.

During 1910 the work in Apple Spraying Demonstration has been conducted along the same lines as in 1908 and 1909. The orchards in which the demonstrations have been given, with the dates on which the public meetings were held, are given in the following table.

The three latter meetings, at Mt. Airy and Taylorsville, were Apple Packing Demonstrations instead of Spraying Demonstrations:

County.	Address.	Owner of Orchard.	Date.
Alexander	Taylorsville	Dr. Henry Lewis Smith	September 23.
Buncombe	Black Mountain	A. V. and E. C. Wilson	March 10.
Buncombe	Weaverville		March 12.
Caldwell	Adako	J. T. Perkins	March 14
Haywood	Canton	M. L. West	March 18.
Henderson	Maxwells Store	R. A. McKillop	March 8.
Iredell	Jennings	J. T. Jennings	March 11.
Jackson	Dillsboro	H. R. Snyder	March 19.
Mitchell	Spruce Pine	H. T. Lawrence	March 16.
Rockingham	Madison	Jas. V. Price	March 5.
Rowan	Salisbury	M. J. Bost	March 1.
Stanly	Albemarle	Dr. D. P. Whitley	March 3.
Surry	Elkin	R. M. Chatham	March 9.
Surry	Mount Airy	Sparger Orchard Co.	March 7.
Surry	Mount Airy	Sparger Orchard Co.	Sept. 20.
Surry	Mount Airy	Sparger Orchard Co.	Sept. 21
Yancey	Bald Creek	C. L. McPeters	March 14.

As in previous years, this work has been done by the co-operation of the Divisions of Entomology and Horticulture, the Division of Horticulture doing the pruning and packing and the Division of Entomology doing the spraying.

LECTURES DELIVERED AT WOMEN'S INSTITUTES.

SANITATION.

MISS MINNIE L. JAMISON.

What I shall say to you shall be in the nature of an appeal to you to co-operate with every agency which has for its purpose the uplift of farm life and the betterment of farm homes. Among other things, I want to call your attention to better sanitary habits in all of our homes, especially in the homes of a great many people—both white and colored—who are less fortunate than you are. The work of uplifting this class should naturally fall upon us—the women of the State—because we are the home-makers, and upon the home-makers rests the health of the people. The call is coming to us from every quarter for better sanitation. Ministers are giving one Sunday each year to the subject at the request of the State Board of Health. Teachers are being made to feel their responsibility in matters of health as never before. In some of the counties of the State they are now organizing sanitation clubs. Newspapers and magazines are crying out against certain unsanitary conditions. County boards are co-operating with the State Board of Health to enforce laws for better public sanitation. All this is good, but it is making only the outside of the platter clean. The root of the whole matter rests with us. Shall we heed the call and begin at once to correct our own mistakes and the mistakes of our neighbor, who does not know? The negro is in our midst. Any help along the line of sanitary habits given to the negro will react upon our own children. It is not strange that he is ignorant, he came from Africa only a short while ago, and with him came some of the diseases we are now fighting. Nearly all of our germ diseases, especially consumption and smallpox, he scatters broadcast because of his lack of sanitary knowledge. We are the people to teach him. Shall we, like the priest and Levite, pass by on the other side, or shall we do the work of the good Samaritan?

DANGERS IN THE HOME.

There is dust everywhere; on these dust particles are tiny plants, or bacteria—so small that 600,000,000 can occupy the space of a grain of sugar, or millions can float in a drop of water. There are two kinds—the useful and the disease germ.

The useful bacteria aid us in giving flavor to butter and cheese, in changing cider to vinegar, in changing the juice of a plant to indigo. They also enrich the soil and as scavengers they purify the air we breathe. They also spoil our food unless we know their habits of life. For example: when we can our fruit and vegetables, we know that unless we have everything clean and kill all of these bacteria by heat and seal the jars air tight, our fruit and vegetables will ferment. We know that two things are necessary—cleanliness and sterilization. The home of the useful bacteria is in the soil. The disease germs multiply only in the human body and that of some of the lower animals (with one or two exceptions). They *live* under various conditions—in dark rooms, etc., and they may be dried and blown about from place to place, but cleanliness and sunshine kills them all. The home-maker should know how these agents of death gain access to the body and what a fortress the body is against their attack when properly cared for. Disease germs can not live in open sunlight and dry air—hence the necessity for flooding our homes, schoolhouses, and churches with sunshine and fresh air.

GERMS CARRIED BY DUST.

Scientists tell us that the germs of diphtheria, pneumonia, catarrh, scarlet fever, measles and smallpox are found in the dust; but by far the most common

of the dust-carried germs is the tubercle bacillus, or the germ of consumption. This germ is found in the dust of a house where careless consumptives live. It is claimed by physicians that the germ may be taken into the system in childhood and remain for years, and yet it may develop quickly, depending on conditions. A healthy body is not a favorable growing place for the germ, but dark, ill-ventilated houses, bad or scanty food, dissipation and drinking weaken the body and give the germs a better chance to grow. Anything that lowers the vitality, such as grippe, pneumonia, overwork and hookworm, gives the germs a better chance in the fight—for fight it is—between the cells of the body and the germs. Consumption is an indoor infection—is rarely if ever caught out of doors, where the sunlight, which is the best disinfectant, quickly kills germs. The real danger, then, comes from ill-ventilated houses and workshops, which have been infected by the sputum or spittle of careless consumptives.

The sputum or spit, therefore, is the chief source of the poison, and its management is the greatest problem in the prevention of consumption.

GERMS CARRIED BY FLIES.

If a spittoon or cuspidor is used the flies will carry the germs on their hairy legs into our food to infect us unless a disinfectant is used.

Handkerchiefs, left lying around, are also a source of danger.

OTHER MODES OF SPREADING GERMS.

The common drinking cup is another means of spreading, not only consumption, but colds, grippe, etc.

Germs of consumption are often found in the spray of saliva expelled by coughing, sneezing and loud laughing.

Why should I be concerned about this matter? you may ask; none of my people have it. Because consumption kills one person out of seven, or because, one out of three, between the ages of fifteen and sixty, dies of it. But a better reason still is that every noble man and woman wants to help suffering humanity. What are the preventives?

PREVENTIVES.

Disinfect rooms or houses in which consumptives have lived.

Disinfect sputum (1 tablespoonful carbolic acid to 1 pint water); or use paper cups and burn, or use old rags and burn immediately.

Use Nature's free disinfectants—sunshine and fresh air—in abundance.

Sterilize all dishes. Boil and sun all dish towels.

Avoid the Drinking Cup and Towel in Common.—How to make a simple drinking cup for school children: Fold a square piece of paper diagonally; then fold one corner back to the left, the other corner to the right; then turn down the two top corners to the opposite sides. This makes a square cup.

Destroy all filth to keep down flies.

Remove breeding places of flies, if possible.

To Keep Down Dust.—Sweep with dampened broom, wet in water in which has been put a very little kerosene, or a broom covered with a bag. Wet the bag slightly with kerosene or water and kerosene. Kerosene is cheap, and is a good germicide. Burn the sweepings.

Dusting should be done with a damp cloth, or an oiled cloth, in order to hold the particles of dust. If we can arouse the intelligent women of our State to the necessity of correcting these habits, the percentage of tuberculosis will greatly decrease in the course of a few years.

DANGERS AROUND THE HOME, OR POLLUTION OF THE SOIL AROUND THE PREMISES AND ITS RESULTS.

We have seen something of the results of the careless habits in the interior of the home; now let us see what are some of the dangers around the home.

Eighty-five per cent of the tenant class and the colored race use no privy, and the discharge from the bowels and kidneys is left on the yards, to be carried by the drainage into our wells and springs; to be scattered by chickens and hogs, and to be carried into the house by flies. The most serious trouble arising from no closet, or the unsanitary closet, is the spread of the germs of typhoid fever and the hookworm disease.

WHAT IS TYPHOID FEVER?

The typhoid bacillus attacks and causes ulceration of certain glands of the small intestines, and the germs are to be found, therefore, in the *bowel discharge*, more abundantly than in any other excretions, although present in the discharge from the kidneys.

COMMON AGENCIES OF TRANSFER.

The germs of typhoid are swallowed. They are carried from the sick to the healthy, first, in drinking water, including milk infected from washing cans in polluted water; second, by the common house fly, and third, by personal contact.

How shall we prevent further cases?

(1) Cover all body discharges (immediately after passage) to prevent access of flies.

(2) Disinfect the discharge as soon as possible with (a) freshly made milk of lime (unslaked) or (b) five per cent solution of carbolic acid, and then bury.

(3) Soak all clothes, bed linen, handkerchiefs, towels, in carbolic acid water until they can be boiled.

(4) All remnants of food left in sick room must be burned.

(5) Nurses should dip hands in disinfectant after handling patient. (Above rules are given by State Board of Health.)

(6) Sterilize all dishes, both in sickness and in health.

(7) Destroy all filth to keep down flies.

(8) Remove breeding places of flies, if possible.

(9) Use screens of mosquito netting, if wire is out of the question.

The danger of the common house fly can not be overestimated. Dr. L. C. Howard, Chief of the Bureau of Entomology of the Department of Agriculture, states that "there are no less than 250,000 cases of typhoid fever in the United States annually, resulting in 35,000 deaths, directly attributable to the presence and deadly work of the common house fly." He says further that "this fly of world-wide distribution is perhaps the most important insect pest known to man. As a direct pest it is a source of great annoyance, necessitating with the mosquito an estimated annual expenditure, in the United States alone, of more than $10,000,000 for the screening of habitations." "The fly feeds on filth and lives in filth, and is responsible for the spread of, not only typhoid fever, but many of the intestinal diseases of children. The effect of its awful work is seen in some of our homes every day, as those we love are borne to their last resting place. And these diseases are preventable." If every woman and girl would take this matter seriously and try to kill out the flies by removing their breeding places, a different story would be told in the course of the next few years.

HOW TO REMOVE THEIR BREEDING PLACES.

1. Flies breed in stable manure. If stables are cleaned and the manure stacked or put in a close bin and covered with a thin layer of dry earth, the flies can not breed in it.

2. Flies breed in human excreta. A sanitary privy will prevent breeding of flies in human soil.

3. Flies breed in the garbage can. Have a large, close box in the back yard, keep slop buckets in the box; have a closely fitted lid and wash and sun both the buckets and the box every day.

HOW TO BUILD A SANITARY CLOSET.

Anything short of a sewer system is a compromise with the ideal; but in small villages and country places, we must make the most sanitary arrangement

possible. The closet should be on a slant below the house and well, where the drainage will fall away from the house to prevent polluting the soil. If germs are to be kept from spreading, it is absolutely necessary that the closet be closed in to keep out flies, chickens and hogs. Probably the best and cheapest method of doing this is the use of the wire screen in the back and over the seat. This will give sunshine and a free current of air, and will prevent access of chickens and flies. The pail system is a good one, and when one is removed a clean one should be left in place of it. The pail should be removed from the front by making the top of the seat on hinges, or from the back by making a swinging door of wire. Dry earth should be packed around the other sides of the privy. Lime, dry earth, or wood ashes should be used freely in the closet. Wood ashes and dry earth are good because the lye helps to kill the germs and both prevent the breeding of flies, in case the lid should be left open and they find access to the stools.

No discharge from the closet should ever be used as fertilizer, but should be hauled away and buried or burned.

If we can arouse the interest and enthusiasm of the women in this fight for better sanitation, the improvement in health and prosperity will be so great that we shall have just cause to be proud of the Old North State. Why should the women of the State not take the lead in this matter of sanitation?

THE IMPORTANCE OF A PROPERLY SELECTED DIET FOR THE YOUNG CHILD.

MRS. F. L. STEVENS.

"I am often led to the conclusion," said a prominent physician, "that one of the most constant sources of infant mortality is the imbecile pride, so common among parents of both high and low degree, in the capacity of their children to eat anything on the table, just as they do themselves. In our every-day practice we physicians meet with this as the cause of at least one-half the illness among little children."

It is frequently the custom among parents to think that what is provided for themselves in the way of food may be given without risk, to the child. The usual haphazard method of feeding children is founded upon ignorance. These parents do not understand that the food which an adult can receive and assimilate does harm to the tender digestive organs of a young child.

Recently, at one of our women's institutes, I discovered a mother offering an unripe apple to her baby, a pale, delicate mite of possibly two and one-half years. I suggested that a child so young had trouble digesting raw fruit, even when thoroughly ripe. Very cheerfully the mother took the apple away from the baby, at the same time rewarding me with a bright smile and a word of appreciation for my interest. When next my attention was directed to this little group the baby was contentedly munching a pickle. Such carelessness and ignorance at this period of a child's life is quickly followed by pernicious results. The great need of the mothers of today is a knowledge of the processes of digestion and the necessity for the selection of foods that are suitable for infants and growing children.

Following infancy comes the more difficult period of childhood, although not usually considered so, when nutriment must be applied to repair the constant waste caused by the active growth of the child. It frequently happens that a plump, vigorous-looking baby develops into a thin, unhealthy-looking child. It is at this time that a knowledge of the values of various foods and the amounts necessary for various periods should be understood by mothers. No amount of general knowledge will be of service, special study is required.

Cereals are a necessary food for growing children as they are rich in the constituents required for energy and for tissue-building, thus producing fine muscular development. Starch being the predominant constituent of the cereals, the fact

can not be too strongly emphasized that great care should be exercised in the cooking of these cereals. An agate-ware or porcelain double boiler is almost a necessity in the preparation of cereals for the nursery, since long cooking increases digestibility. It is important to know what is accomplished in the cooking of cereals. The purpose in long cooking is to secure a change in the starch granules which, when acted upon by heat, are partially changed into a very easily digested substance called dextrine. An extremely high and prolonged temperature is required for this change, without which cereals are not nutritious, and are likely to cause digestive troubles. Starch foods imperfectly cooked undergo fermentation, therefore, for young children it is especially necessary that thorough cooking be the rule.

The following cereals are suitable for young children: Granulated or crushed wheat, which makes a good all-the-year-round food, possessing no fat and requiring cream to make it a perfect winter food; corn meal, a winter food, which builds up strong tissues; cooked gluten; oat flour, from which delicious pudding may be made; crushed barley, which, when properly cooked in milk or in water, is an easily digested nursery food, and when used with gluten, half and half, makes a highly nourishing nursery food. All these foods may be used as gruel, porridge or in the form of simple desserts. White hominy, rice, barley, rye, and wheat preparations are the most desirable, as they possess little or no fat. Oatmeal is the usual cereal to begin with in the nursery, as it contains all the necessary elements for growth. Since it contains fat, if the use of cereals is begun in warm weather, wheat is preferable. All foods containing starch should not be used at all during the first year, unless by medical advice, moreover they must be used cautiously during the second year, when milk should still predominate as a food.

The use of fresh bread and hot biscuits should be forbidden as a part of the diet of growing children. Few people of the present day realize how many intestinal disorders are caused by fresh or under-baked bread or hot biscuits. Well-made, well-baked light bread or corn meal muffins are both wholesome and nourishing in the diet of the young child, but should be at least one day old, care being taken to keep the bread in a perfectly dry, covered box, tin being better than wood. Whole wheat flour is vastly to be preferred to the whiter, less nutritious flours, since it supplies some of the food elements in the child's diet received by adults through other articles of food. Good light bread may be given to the child of 12 months if sufficient number of teeth are present; good butter on the bread may be allowed at 16 months. All cereals should be served preferably with salt and cream; however, with active digestion and a well-balanced dietary, a little pure sugar may be allowed.

The first point to remember in the making of broth for the young child is that good material must be used and that the meat must be treated in such a way as to extract the juices. Cold, salted water should be used, and the meat should be allowed to soak in the water for several hours before it is subjected to heat. Even then it should only simmer. At the last it may be boiled for one or two hours to dissolve the gelatin of the bones, but this is not necessary since a chopped lean meat is more desirable. It is preferable, however, to have broth made the day previous, as then every particle of fat can be removed. Fat plays an important part in the nursery diet, but it is not to be served floating upon poorly-made soups. Lean beef, chicken, veal, and lamb make desirable broths. Milk broth flavored with water from carefully prepared vegetables, or with vegetables that have been rubbed through a sieve, makes a delicious, wholesome food. Spinach, onions, string beans, peas, and celery may be used in this way.

Meats to be served to young children should be selected with special care, and should be prepared by boiling, broiling or roasting, always keeping in mind that the object in cooking any meat is to keep in the juices. Hence, a very light degree of heat is necessary in the beginning to harden the outside layer of the meat and retain the nutritive juices. Meats may be included in the diet of the child after the fourth year, given once a day at the midday meal.

The best meats for the nursery diet are beef steak, mutton chop, roast beef, roast lamb, broiled chicken, and certain delicate fish, such as shad or bass. Among the forbidden meats are ham, bacon, sausage, pork, liver, and all dried or salted meats or salt fish.

Eggs are a desirable substitute for meat at any time, and if properly cooked, give concentrated nutriment. For the nursery, the plain boiled egg is most wholesome. Every woman thinks she can boil an egg, no matter how unskilled she may be in other branches of cooking; yet it is perhaps the least understood of all processes. The usual method is to drop an egg into boiling water, which is allowed to continue boiling for two or three or four minutes, with the result that the egg is almost raw, or the white is tough and leathery, with an uncooked yellow, an altogether hard, tough, indigestible article of food. Eggs used in the diet of young children should be placed in a pan and sufficient water that has come to a boil should be poured over them. They are then set aside upon the back of the stove from 8 to 12 minutes according to whether or not they are liked soft.

The selection and use of fruit in the nursery diet demands careful consideration, always keeping in mind that while the sugars and salts which fruits contain are of great value, they must be wisely selected and used in moderation at all times. The juices of fruit are as a rule perfectly wholesome and may be used sometimes before solid fruits are given. The seeds, pulp, and skin or cellular tissue are usually the disturbing elements.

It is of first importance that fruits be fresh, ripe, and in good condition. The juices of almost any fruits may be used at two and one-half years, either as a drink or in the form of desserts with starch foods mentioned in an earlier paper. Cherries, grapes, raspberries, strawberries, blackberries, pineapples, and similar juicy fruits may be prepared in the following manner and possess the advantage of being always ready for use: Extract the clear fruit juice and boil with a small quantity of sugar, about one-fourth pound to a pint of juice. Boil fifteen minutes, stirring constantly, and skim as long as the scum rises. Strain into bottles or jars. The juice and pulp of a sweet ripe orange may be given to a healthy child of 2½ years, but with this exception, only cooked fruits and fruit juices are safely given to a child until after the fifth year.

It is well to remember that in feeding fruits and fruit juices the best time to give them is at breakfast or at early dinner. Physicians sometimes advise a baked apple for supper when a child is 14 to 15 months old, or for variety the apple may be made into a simple sauce, never, however, having the sauce made with much sugar. As a rule, a child who is delicate and has little appetite for breakfast will rarely turn away from a juicy baked apple daintily served.

After a child is 2½ years old, stewed fruits should be freely used, especially apples, plums, figs and peaches.

After 3½ years, according to the child's power of digestion, the scraped pulp of a juicy ripe apple, fresh ripe strawberries, taken in moderation and results carefully watched; dates and figs are sometimes useful and safe in the diet. With all the other fruits, such as bananas, pears, peaches, grapes, it is best to wait until after the fifth year, unless these fruits are given under the direct supervision of the physician.

The principal trouble in the digestion of vegetables is due to imperfect cooking. They form a valuable addition to the diet, after 3 years, since they contain certain inorganic salts extremely important in the development of a healthy body. The absence of these salts in the diet is largely responsible for the development of a common disease among children known as "rickets." Often this disease is supposed to be the cause of poor nutrition, when in reality it is the poor nutrition that has caused rickets. Besides forming the tissues, these salts found in fruits and vegetables are important in forming teeth and bone. The farm housewife knows that young chickens need mineral salts which she supplies in the form of oyster shells, egg shells, or lime, but frequently she does not observe that her children are poorly nourished and anemic for lack of this very same attention to their diet. We are told that it is not until the end of the twelfth year that the cartilage entering into the formation of bone has become converted into true bone tissue, which fact should show to mothers the importance of supplying foods containing the required salts not only during the nursery period, but all during the school period.

Onions are valuable in the dietary of the child over 3 years of age, always watching for individual peculiarities in ability to digest this as well as other foods. The French consider a cream soup of onion a great restorative in digestive trouble, and this is perhaps the best form to serve onion in the nursery. Celery cream soup or the stewed tender bits may be served safely to the child of 2½ years. The tender raw tips are safely taken by the child over 6. Dried peas soaked 24 hours and cooked very soft, then pressed through a sieve, are a wholesome addition to the diet of a child from 3 to 4 years. Green peas, however, young and tender, may be added to the dietary of a child of 2½ years. Tomatoes are not permitted in the dietary of the child until after the fifth year. Beets also may be added to the list of vegetables of the child of 5. Corn for the nursery should always be served in the form of a cream soup, using only the tender inside part. This, however, should not be served to a child under 3. The indigestible covering of the corn grain is the part that is irritating to the digestive organs of the young child. The potato is a salt-giving starch vegetable. It is about three-fourths water and the remaining quarter is nearly all starch. The fact that it takes 3½ hours to digest boiled potatoes and 2 hours for those that are properly baked, will indicate what method is preferable for the nursery. Potatoes of medium size should be baked from 30 to 45 minutes. When baked in this way they may be given occasionally with dish gravy from meats, such as roast beef, roast mutton, or broiled beefsteaks, or with salt and cream. Cream is much to be preferred to butter as a dressing for baked potatoes. A very common mistake is to serve cream gravies with potatoes to children. These gravies are difficult to digest and should not form an important part of the meal. Among the vegetables prohibited until after the *tenth* year are corn, cooked in the usual manner, lima beans, cabbage, collards, eggplant. Among the prohibited list of raw vegetables are onions, cucumbers, tomatoes, radishes, lettuce, celery.

Many causes of disordered digestion are entirely due to the lack of sufficient water. A baby should be offered water six or seven times a day. For older children it should be remembered that water is needed according to the activity and bodily temperature. The greater the activity, the greater the need of water. We are told that a child weighing 40 pounds should drink at least 20 ounces (1¼ pints) of water a day, and hot weather calls for more.

Frequently one meets mothers who say: "But I don't need any rules for feeding my baby. He eats everything and is quite well." Dr. L. Emmett Holt says he has had quite a large experience with these children who "ate everything" and seemed to relish it, and has followed a number of them to their graves as the ultimate result of such unreasonable and inconsiderate practice.

Still, I am convinced that many mothers would do better in this matter of diet, not only for the little ones but for the grown-ups as well, if simple, reliable facts were given them.

THE BLOOD.

MRS. W. N. HUTT.

Possibly there is no one part of the human body so often spoken of as is the blood, nor is there any one part so little understood by the general public. We hear "her blood is thin," or "he is too full-blooded," or "she had blood-poisoning," or "there is bad blood between them," without ever realizing what it really means any more than if we said the sky is blue.

When I say to the mothers "If you sleep with your windows open it will help you to have good, red blood," how many pause to consider for a moment what is the connection between blood and air?

The blood is a red, opaque, salty fluid. It composes about 7½ per cent of the weight of the body; thus a grow man weighing 150 pounds has about 6 quarts of blood that weighs about twelve pounds.

Just as the body is one, yet is composed of different substances, flesh, bone,

blood, etc., so blood is made up of three things. The first is the liquid part called plasma. This is a clear, pale yellow fluid.

Then, like fish moving in a river, are red objects. These are the red corpuscles and they look something like tiny little pie pans thickened at the edges. Their important work in life is to carry the oxygen to all parts of the body. If we are looking for lessons there are two right here. One is that every one of God's creations has its work to do; and second, that He sometimes entrusts His most important work to the smallest and most inconspicuous workers.

White corpuscles form a third substance in the blood. These look like little clear drops of apple jelly. The doctors were many hundreds of years in finding their reason for existence. They thought they must be the dead red corpuscles. Our Creator, however, knew, as we could not, what was their use. We did not yet realize that there was such an enemy to the human body as a germ. He knew and made provision for it. Deep down within the hollow of the bones is a safe birthplace for these white corpuscles. There they are protected, little affected by the thousand ills or disturbances of the flesh. They emerge from their safe abode ready for their own great life-work—that of defending the body from disease, and this is how they do it:

When a disease germ enters the body these white corpuscles, which do not confine themselves at all to the plasma, but wander where they will through the tissues of the body, approach the germ, and one of them attempts to surround and digest it. Meanwhile the germ is growing and it is a question as to which is the stronger, the corpuscle or the germ. If the germ be stronger and there are enough of them, disease will take place; if the white corpuscle be stronger, the body will never know how near it came to contagion.

From all this it will be seen that when we take medicine "for our blood" we do not make more blood but increase the number of corpuscles in the amount which we already have.

What was said of an egg ought to be said of the blood. It is

> "Nature's treasure house, wherein lies,
> Locked by angels' alchemy,
> Milk and hair and blood and bone."

There was a time, not many years past, when we thought that since there is so much in the blood it would be an excellent thing for anæmic persons to drink it to become strong. That was, however, a mistake. As soon drink the whole river to obtain the fish, or to expect the spoon which carries the food to the mouth to be of nutritive value.

The story of how the blood travels the body and what it does is one of the most interesting stories that could be read. It is sufficient to say here, however, that every time the heart beats, and it does so about seventy times a minute, it sends about half a tumbler full of blood out into the arteries through strong elastic tubes. Think of how much is sent out into the body in twenty-four hours!

The heart is divided into two parts, each part of which is endowed with strong muscles that relax and contract. One-half of the heart becomes relaxed and filled with bright red blood. Suddenly the heart contracts and spurts this stream of pure clean blood out into the arteries to be distributed to all parts of the body. There it gives up to skin or bone or muscle or brain or liver its supply of oxygen and food material and takes instead worn-out dead cells and poisons. The blood that went bounding out bright red comes quietly back to the heart, a dark, purplish stream. There the other side of the heart relaxes, receives it, contracts and pumps it to the lungs where the oxygen of the air, purified by God's free gift of sunshine, is exchanged for the poison of the blood, carbon dioxide. Again the other side of the heart relaxes and the pure, health-giving blood fills it to be once more sent forth. It is as if our grocer's cart came to us ever so often filled with fine meat and bread and vegetables and went away laden with garbage to be by some miracle again suddenly changed into more fresh, nourishing provisions for the next day's supply. When a mother understands this she is not going to say: "I don't want to put my baby out on the porch to sleep; she likes the dim, closed room better." She may like the dimness, but the closed room is certainly not better for the little growing body, and the eyes can be easily shaded.

The young woman who wishes a bright, clear complexion must have good, red blood. The better to obtain that, she should take vigorous exercise to make the heart send the blood coursing through her body, and great, deep breaths to put plenty of oxygen in it. If she does this there will be an indirect good accomplished, that is, her lungs will contain so few unused air cells that tuberculosis can not easily fasten its dreaded grip upon her.

In the blood is a substance that coagulates, as we all know, when it touches the air. That is the body's method of checking bleeding. When a man has little of this substance in the blood he is called a "bleeder" and sometimes loses large quantities of blood from very simple wounds. The thing to do, then, when a child comes in with a small cut, is to cleanse well the wound and let the blood form a hard surface and check its own flow. Above all things, do not use cobwebs or soot. They have clinging to them hundreds of germs, many of which may be harmful. These might be taken into the blood from the open wound, to appear again, perhaps weeks later, in the form of some unexpected disease.

Malaria is a blood disease in that its evil effects are because of the destruction of the red corpuscles. Diphtheria owes a large proportion of its victories not to suffocation, but to the toxins which are produced by the germs and carried to the heart, kidneys or nervous system. Anti-toxin does not kill the germs, it destroys the poison and gives the defenders of the body time to work.

Pneumonia seldom kills by the air sacks of the lungs becoming so filled that the patient can not breathe; nearly always it is because the heart is overburdened by the toxins that have been carried from the germ-laden lungs by the blood.

Just as soon as boils appear many people will say: "Oh, my blood is out of order." Pimples, boils, carbuncles, and erysipelas are essentially skin diseases and caused by pus-forming bacteria lodging there. It is affected by the blood only in that an impoverished condition of the blood means few white corpuscles and other auxiliary substances to fight the germs.

Vaccination accomplishes its splendid results by leaving in the blood a substance that will kill any stray smallpox germs that might get into the body.

Hookworm, that disease whose ravages are felt in every county of North Caroline, is a blood, or rather, bloodless malady because the thousands of parasites living on the blood of the victim so deplete the blood that a scanty supply is left.

Many more of our human ailments might be cited, but enough has been said to convince you of the importance of keeping in the veins a good supply of rich blood. The three main ways of accomplishing this purpose are: Eat enough good, well-prepared food, protect the body from too sudden changes of temperature, and at all times breathe in plenty of fresh air—fill the lungs with it—take deep breaths of it and at night let its cooling breezes blow where they will through the sleeping chamber. There is a saying that blood is thicker than water, and it certainly is, for it not only binds relative to relative, but it adds childhood on to the years of babyhood, womanhood to girlhood, and to womanhood an old age ripe with the memory of a well-rounded life.

HINTS ON BREADS AND BREAD-MAKING.

MISS LILLIE H. JAMISON.

QUICK BREADS.

In the making of breads I shall include the quick breads, built from the popover foundation, as well as the yeast breads.

Bread is almost, yet not a perfect, food, as it is too low in proteid for the amount of carbo-hydrate, and it is almost lacking in fat. A normal appetite calls for butter to supply this deficiency.

To make breads wholesome and at the same time palatable, the starch must be thoroughly cooked (we have no digestion for raw starch) and we must avoid a heavy paste, because the digestive ferments can not break up a heavy mass and change it into the different stages of sugars. We use various methods for doing

this. First, the popover, the thinnest of all the batters, is made light by steam and by the expansion of air; second, the muffin and waffle, heavier batters, are made light by incorporating air in the well-beaten egg, and also by baking powder or soda and sour milk. The last two generate a gas. Soft biscuit, a dough still heavier than the batters, is made light by baking powder or by soda and sour milk. The beaten biscuit has air folded in it by the beating. Yeast makes breads light by a gas generated by the growing of the yeast plant.

The Popover is made by beating the eggs together, to this add milk and salt, pour slowly over the flour until well mixed. This thin batter, called a pour batter, is put into hot, greased popover irons or pans and baked in a quick, but not too hot, oven. The hot pan begins the baking of the crust or shell, and as it continues to harden by the heat, the air beaten into the popover expands and the great amount of liquid is converted into steam and swells and pops over the crust in trying to escape. It must be baked until light and dry, or it will fall.

The Waffle is a heavier batter and needs not only the air beaten into the eggs, but it requires the baking powder in addition. In all quick batters where baking powder and well-beaten whites are used, the whites of eggs must be simply folded in at the last, that you may not break the bubbles of air and gas. Waffles should be served crisp and hot from the iron and never piled up together.

The Muffin is practically the same batter as the waffle but baked in a different way. Muffins should be baked in an oven not too hot, or they will run to a peak in rising. The muffin should have the perfect ring or crack half way between the center and the edge, and should be perfectly browned and very light.

Soft Buttermilk Biscuit—Three things are necessary in successfully making soft biscuit (provided, of course, you have good material and proper proportions). The *first* is a very soft dough; *second*, it must be quickly handled (knead only enough to get in shape), and the *third*, a quick oven. If you will roll and cut your biscuit, they seem lighter. If you bake them too quickly, they will be rough on the top and not well shaped; they will rise very high; the crumb will be whiter but not as sweet. If you like a thin rather than thick biscuit, let them slightly touch in the pan. To my way of thinking, the real Southern biscuit is the most wholesome of all the biscuits. They should be rolled about one-half inch in thickness and should slightly touch in the pan. Bake in the lower part of the oven until smooth on the top, then put on rack to brown above. You will have a biscuit thoroughly browned on both sides and with very little crumb. Biscuit baked in this way will be soft, thoroughly baked, yet not dried out, and very easily digested. A thick biscuit has too much crumb to be eaten hot. It forms a paste which can not be permeated by the digestive ferments. The brown crust is very digestible, in fact it is partly digested.

The Soft Baking Powder Biscuit is mixed and baked in the same way as the soft buttermilk biscuit. It lacks a certain richness and softness you find in the buttermilk biscuit. This is due to the action of the phosphate (a slight trace in nearly all baking powders) on the gluten in the flour.

Kneaded Baking Powder Biscuit—In the making of biscuit and bread of all kinds, if you wish a soft, fluffy bread, make a *soft dough* and do *not* knead; if you want a fine, even-grained bread, make a *stiff dough* and *knead thoroughly*. Many people prefer the smooth and close-grained baking powder biscuit. We use about the same proportions for all biscuit, except the milk. In the biscuit use less milk and knead the dough until smooth. Roll, cut, and prick with a fork. Bake as soft biscuit.

Kneaded Buttermilk Biscuit—Use less milk than for the soft buttermilk biscuit and make in the same way as the kneaded baking powder biscuit. One word of caution about kneaded biscuit doughs: After you begin the kneading do not leave it until you have made out your biscuit. If you work your dough for a while, leave it and then go back to it, you will *always have a tough dough*. When you roll it out it draws back and in cooking language we say it is "tired." This does not hold true in yeast doughs.

Beaten Biscuit—The old-fashioned beaten biscuit was beaten or pounded, but to save time, very good biscuits can be made by putting dough through a meat chopper. The break makes the ideal biscuit. A perfect beaten biscuit should be well browned on both sides, snow-white in the center, and have a crack around

the side. Leave the oven door shut for five minutes when first put in the oven to let the biscuit rise and crack around the edge. Beaten biscuit should not touch in the pan.

YEAST BREADS.

Yeast is a microscopic plant, yet in a higher class than bacteria. It is a plant consisting of a single cell. For growth it requires food, moisture, warmth, and air. The flour furnishes the food. Some of the starch in the flour is changed into a sugar by an enzymn. The yeast in growing changes this sugar into alcohol and a gas (CO_2). This gas in trying to escape makes the bubbles or pores in the dough. In the process of baking the alcohol and gas are both driven off. The compressed yeast is about the best on the market, although it is not so convenient for country people. If you are near enough to a town to get it once a week or once in two weeks, it would save a great deal of trouble and cost as little as the liquid or dry yeast. It can be kept under water for a long time, two weeks or longer. Remove the tinfoil, put in a jar, cover with fresh water and keep in a cool place. The same rule for soft and stiff doughs is true also in the yeast breads. For a very soft, fluffy roll, make a very soft dough and handle as little as possible. If you would make yeast bread in a short time, increase the quantity of yeast and also make a very soft dough. In using a small quantity of yeast you have to wait for those plants to grow and make more plants and run the risk of bacteria getting in the dough and spoiling the flavor, but if in the beginning you add enough plants to make the whole quantity light, you will find that you will have a very palatable, sweet bread, without the yeasty taste so often in yeast breads. You will get a purer culture by doing this, as the companies who send out the yeast are better prepared to grow a pure culture and know more about yeasts than we do.

Quick Rolls—In making the very soft rolls you can not shape them, as they will spread over the pan, but make two or three small rolls and put in a muffin ring and you will not only have a pretty roll but also a wholesome one, as it has crust on all sides. Do not let the dough get too warm. If set in warm water to rise you should be able to hold your hand in it, or if in the warming oven it must not be too warm to place the hand on it.

Pocket-book Rolls must be made rather stiff, as it requires a stiff dough to keep them in shape while rising. This is a very wholesome roll. It has crust on all sides and should be baked to a rich brown. The packed roll, which has very little crust and is nearly all crumb, is very indigestible. Avoid them while hot.

Plain Bread—The loaf bread can be made with or without lard as you like. It rises more quickly without, and many people prefer it. When the loaf is light and ready to put in the oven, brush over the top either with melted butter or with milk; this makes a rich-brown crust. Cut across the top about three gashes and it will be a better shape. This will prevent the loaf cracking on the sides. Bake in an increasing heat until brown, then bake more slowly. A loaf that is baked too quickly will not be as sweet. The well-baked loaf has a yellowish crumb and is very sweet.

RECIPES.

Popovers—2 cups flour, 2 cups milk, 3 eggs, 1 teaspoonful salt. Mixing: Beat the eggs without separating, add milk and salt, pour slowly over the flour, stirring all the time; strain, pour in hot popover pans and bake in a moderate oven until light and dry.

Muffins—2 cups flour, 1 1-3 cups milk, 1 tablespoonful lard or butter, 3 eggs, 1 teaspoonful salt, 2 teaspoonfuls baking powder. Mixing: Beat the yelks until thick and light in color, add milk, flour and salt, melted butter or lard, then carefully mix in the baking powder and fold in the well-beaten whites. Bake in a moderate oven to a golden brown.

Waffles—2 cups flour, 1 1-3 cups milk (more if necessary), 1 egg, 1 tablespoonful melted butter, 2 teaspoonfuls baking powder, 1 teaspoonful salt. Mixing: Same as muffins. Bake on a hot, greased waffle iron. Serve at once.

Soft Buttermilk Biscuit—2 cups flour, one-half to three-fourths cup buttermilk, one-half level teaspoonful soda, 1 teaspoonful baking powder (scant), 1 teaspoon-

ful salt, 1 tablespoonful lard. Mixing: Sift flour, baking powder, soda, and salt together, rub in the lard with the tips of the fingers, then add nearly all the milk *at once* and stir with a spoon just enough to mix. When mixed, turn out on board and knead only enough to get it in shape. Roll, cut, and bake in a quick oven.

Soft Baking Powder Biscuit—2 cups flour, one-half to three-fourths cup milk, 1 tablespoonful lard, 1½ teaspoonfuls baking powder, 1 teaspoonful salt. Mixing: Same as soft buttermilk biscuit.

Kneaded Buttermilk Biscuit—2 cups flour, one-half cup buttermilk or enough to make a firm dough, 1 tablespoonful lard, one-half level teaspoonful soda, 1 teaspoonful salt. Mixing: Make as other biscuit, knead until smooth, prick with a fork and bake as soft biscuit.

Kneaded Baking Powder Biscuit—2 cups flour, one-half cup milk or enough to make a firm dough, 1 tablespoonful lard, 1½ teaspoonfuls baking powder, 1 teaspoonful salt. Mixing: Same as kneaded buttermilk biscuit.

Beaten Biscuit—2 cups flour, one-half cup ice water and milk, or enough to make a *very stiff dough*, 1 tablespoonful lard, 1 teaspoonful salt. Mixing: Make a very stiff dough, knead until smooth, then beat until white and full of air bubbles. Roll, cut with a very small cutter, prick with fork and put in pan. They should not touch. Bake in a hot oven until well done.

Quick Rolls—2 cups flour, three-fourths cup milk, 1 yeast cake or one-fourth cup of liquid yeast, 1 teaspoonful sugar, 1 teaspoonful salt, 1 teaspoonful butter. Mixing: To the lukewarm milk add the dissolved yeast, sugar, salt, and butter; when well mixed add the flour. Beat just enough to mix, set in a warm place to rise; when light make out in rolls, brush with melted butter and put in muffin rings. Let rise the second time and bake quickly, as they rise so rapidly they will soon be too light and coarse-grained.

Pocket-book Rolls—2 cups flour, one-half cup milk or more, or one-fourth cup yeast, 1 tablespoonful lard, 1 tablespoonful sugar, one-fourth to one-half yeast cake, 1 teaspoonful salt. Mixing: Scald the milk, when lukewarm add dissolved yeast and sugar; beat in enough flour to make a drop batter, set in a warm place to rise; when light add salt, lard and enough flour to make a firm dough; knead thoroughly, set to rise; when light pinch off in rolls without breaking the bubbles; roll or press down the center of the roll, brush with melted butter, put in a greased pan some distance apart, set again to rise; when *very* light, more than double in size, bake in a moderate oven. Bake to a very rich brown. This dough can be kneaded just before it is made into rolls and it will be finer-grained, and the rolls will puff apart more, but it is not as wholesome as the first way. You can roll and cut with a biscuit cutter and fold, but they are not as pretty and you break up some of the gas bubbles.

Plain Bread—1 quart flour, 1 cup milk or water, 1 tablespoonful sugar, 1 teaspoonful salt, one-half to one yeast cake or one-half cup yeast. Mixing: Make as pocket-book rolls, when light mould and brush over the top with lard or melted butter, let stand until double its size, make three cuts over the top, brush again with butter and bake in a moderate oven. Bake in an increasing heat until brown, then bake more slowly.

Liquid Yeast—1 quart water, 3 large potatoes, bunch of hops (tied in cloth), one-fourth cup salt, one-half cup sugar, one-half cup old yeast. Mixing: Put the hops and potatoes in the water and boil until the potatoes can be mashed. To the mashed potatoes add the water, sugar, salt, and when cool, the old yeast. Keep in a cool place. It is ready for use as soon as it ferments well.

THE COUNTRY SCHOOLS.

EDNA REINHARDT.

We are hearing, nowadays, a great cry for reforms in the country schools. Newspapers and educational journals devote columns to the discussion of school work in rural districts. "Industrial training for country children"—agriculture

for the boys and domestic science for the girls—is the cry that the educational leaders are sounding in the ears of the country school teachers. The land is waking to the fact that the country school does little for the boys and girls who are to stay on the farm. And what part are the farmers over the State taking in this awakening? Is it they who are agitating the question of school improvement? Is it they who are demanding that the schools give their boys and girls some preparation for their life work? With few exceptions they are the people who are saying least. The people most directly concerned are the ones least interested.

There are farmers attending these institutes to discuss soil improvement; to discuss better methods of stock-raising and better methods of stock-feeding. There are farm mothers here to discuss better methods of housekeeping. Yet, when have these parents ever come together to talk over better methods of educating their children? The great majority of farmers know nothing of the school work or the school life of their children. There is not a farmer among you who would keep his cattle for six months in a pasture that he had never inspected, yet you send your children to school and never think of inspecting the schoolhouse or going to observe the school work. You know vastly more about the training that your horses get than you know about the school training that your children are getting. Very few of you ever visit the school, so how can you know what is going on there? Just so we teachers do not administer punishment in such a manner as to leave marks upon your child we are not likely to see you at the schoolhouse. If, however, we do use our "ruler" so as to bring out a healthy glow on your child, you do not hesitate to descend upon us in all your wrath. We are at liberty to make as many bad impressions upon his mind as we please, but we must not mark his back. Yet the physical being will recover in a few hours, while a false impression can never be erased from the mind.

If I could in a word sum up the greatest need of the rural schools, I believe I could with truth say, visiting parents—parents who visit thier school regularly with a view to ascertaining its needs and strengthening its work. And may I put in a word just here for the teacher? When you have visited the school, observed closely the work done and found a fault, don't go home and discuss it with your children, or spread the news over the neighborhood. Go to the teacher and tell her frankly what you think. She will not resent it. When you criticise a teacher before her pupils you are destroying her possible influence for good. No teacher can do much for children whose parents are antagonistic to her work.

And now I want to suggest a few ways in which country people may make their schools greater powers for good.

The first great need, I believe, is better built, better cared-for schoolhouses and grounds. Very few of the rural schools have proper means of ventilation and regulating light. I have seen hundreds of children studying with the blinding sunlight on their desks. (Still shades can be had for fifty cents each.) In many of the country schools the drinking-water is carried as far as a quarter of a mile. When it reaches the school the common dipper is passed from lip to lip. Each time it is used it is put back into the bucket and virtually washed in the water that the children drink. There are probably not ten in a hundred of the country schools that have sanitary closets. With conditions like these why do we wonder that so many children wear glasses; that throat trouble is so prevalent? (Out of seventy-five children in my school last year, sixty showed diseased throats.) Where can a child run greater risk of hookworm infection than in the country school?

Every school should have a playground which is provided with suitable outdoor games for the children. It is an injustice to ask children to play in the road, or on a rock-covered, gully-scarred ground. It would be but little trouble and expense to the parents to equip basketball and baseball grounds, and to put up swings and turning poles for the children. Nowhere will a child learn self-control better than on the playground; and with few exceptions, the children who play best study best. But, you say, this is work for the Woman's Betterment Association. Yes, it is, and fine and beautiful work are the Betterment Associations doing; but too often these associations are made up of a few faithful workers. If this work is to be left to the Betterment Associations, every parent

in North Carolina should be an *active* member; for surely no one would entrust his child's health and training into less interested hands than his own.

Into the good schoolhouse must come a good teacher; and in the selection of this teacher the parents should exercise the greatest care and thought. Eighty per cent of the population in this State is rural. About ninety per cent of this rural population is entirely dependent on the country public schools for training. How great, then, is the responsibility—the influence—of the country teachers who are to train seventy-five children out of every hundred in North Carolina for citizenship! Yet this is seldom given a thought. Of all classes of workers in our State the country school-teachers are probably the poorest qualified. Few enter the work with the intention of making it their profession. It is but a stepping-stone, for many, to more lucrative positions. We have numbers of boys teaching in order that they may attend a business college and then swell the already overcrowded list of salesmen. Girls teach whose one desire is a summer outing. In one county in North Carolina one hundred and twenty-five teachers attended the County Teachers' Institute this summer. One hundred of these were inexperienced and less than six had college training. I was told, too, that only five first-grade certificates were issued in that county last year. Truly, only the "nubbins of education" are fed to the great majority of country children—and it is the fault of the parents. When the parents become interested enough to demand better teachers they will get them. So long as the parents are so indifferent to the progress of their children as to allow them to be imposed upon by poor teachers our State will not make the advance we are hoping for. *We must have better teachers.*

When a clean, comfortable house and a good teacher are provided it next becomes the duty, or privilege, of the farmers to see that their children are in school every day. How often do you hear a farmer say: "Well, I'll not send my children the first week or two. I've got a few odd jobs I want to finish up"; or, when a child has been forced to lose a day: "My boy couldn't go on Tuesday; I'll just keep him at home this week and start him in *fresh* next Monday." We country school-teachers waste fully one-half of our time in school on account of poor attendance. With five or six grades it is no easy matter to teach the child who comes a day and misses a day. The best teacher in the land can not teach a child unless he is at school. Our poor attendance is largely due, I believe, to pure and simple carelessness on the part of the parents.

Another problem confronts the country school—the course of study. It is the boast of many rural schools that they prepare children for college. So often we hear this remark: Oh, yes! We have a good school here. We prepare our boys and girls for college." Yet less than ten country children in the hundred ever go to college. What is the country school doing for the ninety or ninety-five who stay at home? Beyond the rudiments of education does it in any way prepare them for their work? If the object of the school is to prepare for life, is not the country school missing its aim when it fails to give agriculture and domestic science a place in its course? I am not going into a lengthy discussion as to which gives the most culture, knowing how to take a Latin word of three letters and twist it into one hundred and fifty different forms, or knowing how to take a grain of corn and raise three ears, twelve inches long. I do not want to discredit the study of the classics, but I want to emphasize the importance of studying agriculture and household economics. Remember that ninety out of every hundred country children are going to the country school only, and they are going to be farmers and home-makers. I believe in higher education with all my heart, but I fail to find the "fitness of things" when I see country girls—girls who are going to be farmers' wives—struggling with algebra and bank discount when they know nothing of cooking and sewing. Farm boys are spending days in the study of the same and like topics, when they will never have a bank account unless they are taught to farm better than their fathers are doing. We have in our public schools girls studying ratio and proportion. To judge by the biscuits they make we are forced to believe that they know nothing about what proportion of soda to use. Out of twenty-five grown girls in one country school last year only one could cut out and make a shirt waist. Three could fry meat and make soggy biscuit. Not one knew the first thing about the nutritive value of foods. Yet in a few years these girls will be the housekeepers of that neighborhood.

Many are the country women who work in the field and hire their sewing because they don't know how to sew.

There is no reason why the principles of agriculture and domestic economy that you men and women have come here to discuss can not be taught in the country schools. Start the boys and girls off with some knowledge of their work, and with *respect* for their work. Have you never heard boys say that they were farming because they "weren't fit for anything else"? And have you never heard girls speak slightingly of domestic work? What is this but a lack of respect for the work they are doing? Wisely and well spoke the man who said: "The secret of success is being in love with your work." When country children are taught to do country work well they will cease to look upon it as drudgery. Their work will become a respected art—and when we respect our work so much that we dare not do it poorly we will succeed.

STATE FARMERS' CONVENTION.

(ROUND-UP INSTITUTE.)

At the instance of the faculty of the North Carolina College of Agriculture and Mechanical Arts, in co-operation with other interested parties, the State Farmers' Convention was organized seven years ago. Subsequently, at the 1906 meeting, the Farmers' Convention was affiliated with and made a part of the Farmers' Institute work conducted by the State Department of Agriculture.

From the first meeting of the Convention it has grown in numbers and usefulness. The attendance this year was the largest in the history of the Convention.

The following very interesting program was carried out:

Program.

TUESDAY, AUGUST 30.

MORNING.

11:00. Address of Greeting by Major W. A. Graham, Commissioner of Agriculture.

11:10. Address of Welcome by President D. H. Hill of the Agricultural and Mechanical College.

11:15. "The Twentieth Century Farmer," A. L. French, Rockingham County.
Discussion.

12 M. "Production and Preservation of Home Fruit Products." Assistant State Horticulturist S. B. Shaw.
Discussion.

AFTERNOON.

12:30. "Farm Machinery." John W. Robinson, of Catawba County.

2:15. "Why, When, Where, How to Use Lime." Director C. B. Williams of the Experiment Station.
Discussion.

3:00. "Does it Pay to Fertilize?" B. W. Kilgore, State Chemist.
Discussion.

4:00. Demonstration, in the field, of the proper way of selecting seed corn, conducted by Messrs. C. B. Williams, T. B. Parker, I. O. Schaub, C. R. Hudson, C. L. Newman and W. C. Etheridge.

EVENING.

8:00. President's Address. Hon. Thos. W. Blount, Washington County.

8:30. "Wealth in Fruit." Prof. W. N. Hutt, State Department of Agriculture.

WEDNESDAY, AUGUST 31.

MORNING.

7:00 to 10:00. "Live Stock Judging."

Dairy Cattle	Hogs
Prof. J. A. Conover.	Mr. A. L. French.
Prof. W. F. Turner.	Mr. R. S. Curtis.

10:00. "Ease With Which to Get Rid of Cattle Ticks." Dr. T. M. Owen, U. S. Department of Agriculture.

Discussion.

10:45. "Cover Crops." Prof. C. L. Newman, A. and M. College.

Discussion.

11:30. "How I Averaged More Than 46 Bushels of Wheat on 50 Acres." Mr. J. Walter Myatt, of Johnston County.

Discussion.

AFTERNOON.

12:15. Business Meeting of Dairy and Live-stock Association.

2:15. "Building Up the Dairy Herd." Mr. Henry P. Lutz, of Catawba County.

Discussion.

3:00. "Results of State Demonstration Work." Mr. C. R. Hudson, State Agent.

Discussion.

3:45. "How I Raised My Acre of Corn." Master Chas. F. Phillips, of Randolph County (134 bushels), and Master Lee Blackwell, of Granville County (weighs 76 pounds, raised 76 bushels). Both members of the Boys' Corn Clubs.

Discussion.

4:15. Demonstration of blowing out stumps by the Dupont Powder Company, Nashville, Tenn.

EVENING.

8:00. "The Farmer as a Business Man." Dr. H. Q. Alexander, of Mecklenburg County.

8:30. "Farming Possibilities Resulting from Drainage." Mr. John A. Wilkinson, of Beaufort County.

9:00. "Money from Better Methods of Farming." Mr. W. A. Simpkins, of Wake County.

THURSDAY, SEPTEMBER 1.

MORNING.

7:30 to 10:00. "Live Stock Judging."

Horses	Beef Cattle
Dr. W. A. Chrisman.	Mr. J. A. Conover.
Dr. G. A. Roberts.	Mr. R. S. Curtis.
Dr. L. F. Koonce.	

10:00. "Silos and Silo Building." Mr. J. A. Conover, U. S. Department of Agriculture.

Discussion.

10:45. "Live Stock Farming." Dr. A. S. Wheeler, of the Biltmore Estate.

Discussion.

11:30. "Keeping Tobacco Soils Fertile." E. H. Matthewson, U. S. Department of Agriculture.

AFTERNOON.

12:15. "Enriching Land by Stock." Edgar B. Moore, of Mecklenburg County.

2:15. Business Meeting:

Reports of Committees.
Resolutions.
Election of Officers.

The following officers were elected:

Frank Spruill, President, Scotland Neck, N. C.
Dr. A. S. Wheeler, Vice-President, Biltmore, N. C.
I. O. Schaub, Secretary, West Raleigh, N. C.
Program Committee: Frank Spruill, I. O. Schaub, T. W. Blount, T. B. Parker.

PRESIDENT THOS. W. BLOUNT'S ADDRESS AT FARMERS' CONVENTION.

Another twelve months with attendant blessings, trials, misfortunes and triumphs have rolled by, and midway between seedtime and harvest we are again assembled in convention to renew old acquaintances, to extend friendships, to recount our varying experiences, to discuss questions of vital import, and to imbibe a new stock of inspiration fitting us for the duties of the future. It is matter of congratulation that no unusual disturbance has come nigh us, and that while misfortunes, reverses and losses have come to us individually, the markets of the world are calling with impatient voices for the products of the farm, the flow of gold is toward the farmer as never before, and the indications are that the fruits of the ground will reward the labors of the industrious, intelligent tiller of the soil with a fair yield.

The comforts of life are going more and more to the homes in the rural districts. The mails are daily delivered at the farm home. The rural telephone makes possible a social and business intercourse that will render the isolation of the past but a memory. At the country schools many of the best teachers are giving loyal and efficient service, and teaching is fast being recognized as a matter of leadership, no longer are the pupils treated as dumb driven slaves to have a certain number of rules and formal examples pounded into their heads daily. Rational methods are being applied, better schools, better buildings, and better facilities for reaching the schools are in evidence everywhere. Transportation facilities have been increased, the cost of travel reduced, the means of disseminating information are far better for the remote country districts now than they were for the ordinary town twenty years ago. Wages are good, the moral, social, religious and financial condition of the country people are better, perhaps, than ever before in this State. There is less drunkenness, less brawling, less dissipation of the farmer's earnings in questionable ways, and above all, a greater effort is being made everywhere to ameliorate harsh conditions, to give the farmer needed information, to lend dignity to his calling, to conserve his health, to encourage him to make his home more comfortable and more attractive, his surroundings more sanitary and his soil more productive. The farmer himself is becoming more and more interested. Already he is shaking off the cold, fossilizing influence of that fatalism which is largely a heritage from his Saxon ancestors. Already the farmer is realizing as never before that his calling is a beautiful science, full of interesting problems that tax the powers of the brightest intellects to solve, and offering a field for well directed enterprise and honest industry whose rewards are second to none of the other callings of the masses.

The farm life is the true home life, it is the history of nations that progress in civilization shows itself strongest in the life of the open country. Those of you who have read such books as "A Southerner in Europe," will hardly need argument to give force to this statement. It is wonderful how many of the leaders of thought and action among men have been reared on the farm, and in our own State many of them successful farmers. We must learn more to follow leaders along right lines, to accept with more readiness the teachings of the best thought bearing upon our business, to discriminate between ideas applicable to our own situation and those applying to others, realizing that knowledge is a growth, the result of constant persistent digestion of crude matter. There is no royal road to success; we must sweat for it if we would win the richest prizes of the farmer's calling. Nature abhors a vacuum, but a sleepy drone on a farm is mighty near a vacuum there.

Great as has been the improvement of farm life and of farming methods in the past twenty years, they are as nothing to the advance made along other lines of industry. In transportation and manufacturing, in the invention and development of wonderful mechanical devices. All over this land railroads are as common as cattle trains, great floating palaces go scurrying across the seas at the speed of a train, while by means of the wireless they are never out of speaking distance of the shore during any part of the three-thousand-mile voyage. Not only is lightning taught to bear man's messages of love, business or distress, to give instant warning of approaching danger, and to quote the markets of the

world every minute of the day, but it is made to glow with unwonted brilliancy in the drawing room, the shop or the humblest home, that there may be light.

By means of the telephone the mother in distant San Francisco may listen to the prattling of her babes here in Raleigh. In the science of medicine and surgery men have accomplished even greater marvels in progress, until now the most dangerous diseases are combatted by human intelligence with more ease than was a common case of chills thirty years ago. And how has all this been accomplished? By closing the eyes to the evidences of learning and scoffing at the teachings of experience as worthless lies, and sneering at what was not understood as of no value? By no means. On the other hand, the richest rewards have been offered to encourage investigation and the development of useful methods and better appliances. Twenty years ago the local sawmill man was a chronic bankrupt. Timber was plentiful and cheap, wages low, the working hours long, the people needed houses then as much as now, perhaps, but he could not succeed. Better business methods were adopted, improved machinery, the invention of skill and learning was installed, operatives with expert knowledge of the business employed, and presto, the lumber manufacturer becomes a business man of the first rank.

In all the walks of life where marked success has been achieved, men have been eager to seize upon the suggestions of science, the inventions of genius, or the teachings of experience to aid them in their labors, but the farmer has been disposed to disregard "book learning" as of no avail in his calling, unless perchance he should rely upon the signs of the zodiac, the phases of the moon, or the directions of the wind as potent factors controlling his operations. Books are the conservatories of knowledge, the granaries in which are gathered the accumulating harvests of learning for all the ages. And any calling, any business, that scoffs at the teachings of science, the discoveries of the student, or the lessons of experience, must inevitably fail, for it eliminates knowledge, the one essential factor of success.

Knowledge is indeed power, and there is no business in which knowledge, both theoretical and practical, is more useful than in agriculture. A farmer to be successful must not only be a keen observer of Nature's operations and the laws of supply and demand, he must not only know how to perform certain farm operations well, but he must have an intimate knowledge of the reasons for those operations. For instance, in some sections the farmer plows his land in ridges before planting seed in early spring and levels those ridges by cultivation as the warmth of the summer sun supplies more heat to the ground and evaporation makes increased demands upon the soil moisture, while his neighbor exactly reverses this order, planting seed in the level cold ground, but for his convenience in cultivation makes the ridge, as the heat, the crop and the diminished rains render the conservation of soil moisture the most important consideration in every step in tillage. What is popularly termed "hilling" crops in the South might better be termed "killing" crops, a practice continued solely for the "kivering up of grass" that should never have been allowed to show itself above ground.

This operation alone is responsible for more loss to the Southern farmer every year than all the floods and storms and droughts. All because he will not hear the teachings of science, nor heed the constant testimonies of experience. For years men had observed that yellow fever disappeared with the first frost, but they did not think that it was the killing of the mosquito that put a stop to the spread of the disease. Farmers know that about corn hilling time their crops begin to fail, but they do not attribute that to the plowing up of the root system at the very time when the crop needs all its resources most. For this reason, farmers at first maintained that cast iron plows poisoned the soil, and many of them stipulated when leasing land that they should not be used. They were right in their deductions, but wrong in placing the blame. I know that the cultivation of the farm is not conducive to study and research, but there is no reason why we farmers should not read up on our business during the long winter evenings, and there is no better place to think than when guiding the plow in spring. Thinking as we plow that furrows pregnant with thought may produce an abundant harvest. When the cultivation of cotton was reduced to the present slipshod method, the

ignorant negro and spavined mule could loll through the program some time during the summer and finally bring the glad tidings to the village storekeeper that the "crap was laid by." Such farming is the bane of the South, as every one knows, but it's the only kind unthinking labor is capable of. We can not have diversity of farming without diversity of knowledge, and this will not come until an eight-months school is maintained in every country district in the State. Most of us have passed the allotted time of attending school, but we had to learn in the bitter school of experience, and if we will but try to supplement this with such knowledge as we may gain from books, the agricultural papers, and most important of all, from Farmers' Institutes, we may yet make this Old North State blossom as the rose.

There is no disguising the fact that want of knowledge is responsible for the low state of agriculture in the South to-day. The old negro farm hand has passed away, and with him passed the knowledge and abilty of his race as such to till the soil; the Southern white man with the best advantages has moved to town, thus leaving the impression everywhere that farming was the calling of the halt and those who could not help themselves.

We must change all this, and for our own credit's sake we farmers must take the lead in demonstrating that this appearance is deceptive. We must study better methods of letting out our land. We must follow more rational cropping plans. We must learn the lesson of thorough and deep drainage; and there is but one system worth the price, but one system worthy of the adoption of a progressive farmer, and that is tile or underdrainage. I do not mean by underdrainage that a farmer must put tile in the few ditches that he has and fill them, but I do mean that the best land in this State will never yield within fifty per cent of a normal crop until tile drains, five feet or more deep, are sunk plentifully in the ground. No matter how much fertilizer you apply, you can not hope for a full crop from any of the best lands of the State without deep and thorough plowing during the fall and winter, and deep plowing is suicidal on wet or undrained lands. We will continue to be the helpless vassals of the fertilizer dealer until we learn to grow more legumes with which to supply humus to our soils, in the shape of turned-under crops or stable manure, and it is folly to attempt to get humus in an undrained or unbroken soil, the ferment of the decaying vegetable matter only adds to the already too acid condition, and none of the legumes do their best in such soils. It is folly to expect the cropper, as we now know him, with his move-every-winter program, to do any work worth while improving the soil. In fact, he and the nonresident landlord are the arch enemies of Southern agriculture; both think of little more than avoiding expense and bleeding the land for all it is worth. Neither, as a rule, cares for the social or educational conditions of a community where the land is so held, and as a result there is apt to be neither schools nor churches in such a community.

The direct property tax system, as it is now operated, tends unjustly to put an undue share of the burden upon the small farmer, and to enable the large landholder who lives in town, generally at the county seat, to escape a greater part of his just share of the taxes, by getting his property valued at about half per acre what the land of the small resident owner is taxed for. It is due to neglect of our public duty, my friends, that these things are true. We owe it to ourselves to see that an eight-months school is in operation in every country district. We owe it to ourselves to see that some system of farming is adopted that will insure the proper fitting and cultivation of the soil. We owe it to ourselves to see that the large tract of land bears its pro rata share of the burdens of taxation in accordance with its real value. I wish to emphasize this wrong now, because about this season of the year many a complacent tool of the tax dodger is slipping into a place where he can be of service to his patron next spring at listing time.

It is matter of great pleasure to me that our agricultural departments are turning more to helping in the home. Here is the place quickest to work a revolution in farm life in the South. The women take more readily to teaching; they naturally expect the fashions to change every season, and they study cooking, canning, and household hygiene as readily as they do the season's fashions. To the American woman's credit be it said, she abhors nothing more than becoming a fossil. And the farmer's wife has had so few conveniences, so little of the comforts of life, that she is eagerly seizing upon every opportunity to promote better

home conditions on the farm. The bulletin issued this summer by our Agricultural Department on "Canning Fruits and Vegetables in the Home," created quite a commotion among the good housewives of the State, and I venture the assertion that it has already accomplished as much for the helping of the homes as all the farmers' bulletins issued for men by that department in five years. And the reason is solely due to the fact that the women are not only willing, but eager to learn. Thank God, their worth in the home, the church, and the State, is being more and more recognized, and shame upon the slovenly man who would not bid them God speed with all his heart, and forthwith set himself to work to imitate their good example. When such a day shall come, the homes on the farms in the South will speedily regain whatever of prestige poverty and the lack of schools has cost them, and *we* shall go on producing that noble race of chivalrous men and pure women for which our State has long been famous.

It is no longer a matter of pride or sectional sentiment that makes improved farming methods desired, but a matter of cold necessity. Slovenly, unbusinesslike methods have brought farming face to face with the question of better methods, or disastrous failure. Our free lands have been exhausted. In one generation we have burned the humus out of the soil of a continent, and while our population is steadily increasing, the productiveness of our farms is rapidly decreasing. Our people consumed more than three hundred pounds of meat per capita in 1840, but in 1900 our supply was only about 180 pounds, and last year in spite of the high price of meats the supply of cattle in this country decreased more than two million heads. In 1906 we exported a surplus of 733,000,000 pounds of beef, but last year this surplus fell to 419,000,000 pounds, with the price steadily going up. The great ranges of the West have reached the high-water mark of production, the cattle and corn producing lands of the East are not getting any cheaper, and the demands for meat and bread are becoming more insistent each year, and with one or two crop failures this new country would be on the verge of a famine nearly as distressing as the one Joseph foretold in Egypt.

In all this I can see nothing but the best kind of an opportunity for the intelligent, industrious North Carolina farmer. From the coast to the foot of the mountains the clovers, vetches and peas grow in luxuriant profusion, and the cattle ranges of the mountains are famous. Corn, oats and rye are staple crops in nearly every county in the State, the winters are mild, and there is generally enough moisture in summer to keep pastures doing good work, certainly in the eastern part of the State, and we, an agricultural people, have to pay freight on most of our beef, pork, oats, corn, hay and other staple farm products for more than a thousand miles. There was not enough corn on the farms of some of the eastern counties on the first day of June to last one week, and like the widow who fed the prophet, they only had meat enough of home production for one meal. Now, all this means that we are mighty poor farmers or else we have mighty poor land.

What is the real trouble? Is the land poor? No, we don't drain it. We don't break it properly. We don't plant winter cover crops. We don't plant enough legumes. We rely upon chemical fertilizers purchased on time very largely. We don't begin farming operations until about the middle of March, and then we plow with one spavined mule, the most of us do, and break the ground in streaks four inches wide and from one to two inches deep, making a succession of clods laid in ridges that never felt a harrow and never will until the man behind the plow gets the scales knocked from his eyes and he begins to realize what a farce his farming is becoming to be regarded. The production of the farms on the coastal plain of this State can be doubled next year by drainage and thorough plowing in the fall. Their yields can be increased three hundred per cent in twelve months by draining, fall plowing, the sowing of winter cover crops, and the turning in next fall of a heavy legume crop. Add to this program the helpful influence of ten cattle for each forty acres in cultivation, ten good sows, four good percheron mares, a small flock of sheep and a pound of dog poison, and prophesy fails to foretell the glorious transformation that would take place in five years, where energy and intelligence of average grade directs the operations. But we will never accomplish anything but a failure as long as we rely upon ticks to fatten our cattle, and lightwood knots to improve the breed of our hogs. Rather will

poverty continue to sit upon our front gate, and a fertilizer mortgage remain our boon companion.

Then let us forthwith inaugurate such a system of farming as will eliminate slipshod methods. That will supply labor to farm workers the year round at good wages. No man can live on poor wages received for hardly half the year. The family of such a man will never know aught but direst poverty and darkest ignorance as long as they live under such conditions. I know that some of them do not want to work quite as long as they do now, but by setting them a good example, and by giving them a little friendly advice, and having patience with their weaknesses we may coax them into better ways after a time. No business on earth can succeed where the operatives are idle half the time and the implements left to rot and rust in the weather, as is the case on many farms.

Then let us forthwith inaugurate a system of farming in North Carolina that will produce on the farm all the milk, butter, eggs, beef, pork, hams, mutton, grain and hay the farmer's family and his live stock need for comfortable living. Let us inaugurate a system of farming that will produce on the farm the best breeds of cattle for milk and for beef, the best strains of hogs for bacon and lard, the finest percheron horses, such as the best farmers in the finest countries in the world are proud to own and rear. Let us forthwith inaugurate such a system of farming as will produce on the farm all the fertilizers required for bumper crops of all the staples every year.

Let us inaugurate such a system of farming as will have homes comfortable and sightly, sanitary and substantial, that our wives and daughters may do their work with more ease and have more life and energy left to give to intellectual pursuits, that our mothers may rear more healthy children, and that the attendance upon the public schools may be more in accord with the needs of civilized progress.

THE TWENTIETH CENTURY FARMER.

A. L. FRENCH.

That the business of farming is undergoing a great change few thinking men will question, and that the individual farmer who has not already done so must change his practice to meet the changing conditions is patent to students of the times. That we as farmers are not preparing so rapidly as I believe we should to meet the conditions that, in my judgment, will press hard within a very few years is my excuse for taking a few minutes to-day upon the subject assigned me.

The pioneer (American) farmer of the nineteenth century was a power in his day. He did his work of clearing away the forests, establishing homes, building and maintaining the little country schools—in which his children studied the questions that were vital to that generation—worshiped his God in and out of the rude country church, and attended to his political duties in a manner that arouses yet and always will the admiration of students of history. And if he did not give the heed he should have done to the care of the soil, we can not blame him, because the need was not pressing in that day, and that was not *his* problem. The care of the soil *is* the problem of the twentieth century American farmer. In their struggles for a livelihood our fathers—from the time the first axe was struck at the root of the forest tree—were obliged to skim, as we may say, the cream of the fertility of their soils. And we of to-day find ourselves with a vast amount of the skim milk of the soil on our hands, to which we must add the cream before we can hope to reap the fat. This sad condition of soil seems most inopportune to us, as the world is calling to-day for greater returns from our "skim milk" soil than was asked of the fat soils of our fathers' day. This, as we see it, is about the soil problem of the twentieth century farmer, and hence we believe that a different brand of farmer is needed to-day—where we must *build* soils and at the same time harvest a greater crop per acre than was needed in our fathers' day, when a small crop was required from virgin soils. And the twentieth century farmer is being called upon for many things that are real necessities to

him and his family that were hardly thought of by the farmer of yesterday. His social condition is changing and must change if he is to live on a social plane with men of other callings ranking in importance with the great business of agriculture; money to him of to-day is not a need but an absolute necessity. I would not pose as advocating the following by the farmer and his family of every whim of fashion set by the idle rich, but if the farmer's family shall associate on an equality with the families of men engaged in other remunerative lines of work, he must provide a decently furnished home. If his sons and daughters are to start on the same level with the city boy and girl, they must be as well educated in order that they may be enabled to give of the fruit of their minds as well as to receive from others. They must be modestly and becomingly clothed, have books, papers and other periodicals in order to store their brains with the ideas and ideals that the great writers are giving to the world. All this points to the fact that the twentieth century farmer must be a business man, that he may secure in an honorable way the cash required to properly improve his soil so as to enable him to harvest ever increasing crops, but must have judgment sufficient to enable him to handle the products of his acres in a way that will return him the most dollars and at the same time allow him to retain the largest amount possible of the soil building properties the crops contain. The purchasing end requires the same degree of business skill as does the selling end, as bad buying will as often deplete the farmer's net income as will poor sales. The twentieth century farmer in North Carolina should be—because of his numbers—the controlling power in the political life of the State, but he will never be this so long as he allows some person engaged in another line of work to do his thinking for him; because so long as he allows the other fellow to do his thinking and planning, he will be simply the tool or mouthpiece of the better trained man and be used to do his will. I am not hinting that the other fellow's way may not be a good way for him and his business, but we want the farmer to use his political as well as other powers to care for *his* business, as it is a noticeable fact that men in other lines are pretty generally looking out for their own fences.

What may we gather from the foregoing? This, I believe, that the twentieth century farmer must needs have a general cleaning up and remodeling of the shop where he does his thinking. He must discard many of the notions handed down from the previous century, must take up a line of thinking that his father knew nothing of, must get away from the notion that the farm is only a place to stay until something better turns up, must take hold of the fact that in this twentieth century farming has become a business, a business that requires capital of both cash and brains for its proper handling, and he who thinks to the contrary is going to be sidetracked before he has gone far.

This man must, as this century forges along, come to own the title of educated, trained, thinking business man and conscientious citizen, and when he has earned this title he will stand as the peer of any man, whatever his profession may be: for then he will be recognized as the master of something. Our farmers as a class do not measure up to these twentieth century requirements, and to see that the generation coming on *does* rise to the needs of the time is, I believe, one of the greatest problems before us to-day, for North Carolina needs nothing more to-day than she needs real farmer citizens. So this training of great farmers is a duty we owe to our State, and it should be a privilege that every patriotic citizen will enjoy—this work of training men for the mastery of the greatest business of North Carolina. It should be a work of love to which every father and mother on the farm will turn with gladness, knowing full well that the brightest of their sons are fit foundations on which to rear able, thinking, masterful farmers. The mother especially must get away from the idea—which has been altogether too commonly held in years past—that the bright boy is too good material to make a farmer of. This may have been the case in the nineteenth century—though I have my doubts about it being true then—but it is not to-day, for if we can see truly what the future holds for the real farmer, there is much of promise in the vision. The fathers of North Carolina should, I believe, take their farm boys into their own lives, invite their confidence, and having gained this, fill their minds so full of the ideas of the nobility of the farmer's work in the world, the cleanness and joy of life lived in the country, and the financial returns, that no other life will appeal to them as does the life on the farm.

The father of to-day must study and so obtain a grasp on the why and wherefore of the farming business as to be able to start the training of the boy right out on the home acres, and by investing him with some responsibility start him on the road to self-reliance.

The teacher of the country school should be instructed as to the need of our State along agricultural lines, that she may inspire the student to earnest training of his mind toward a broad agricultural life. Preparation for his work should include some instruction as to the needs of soils, how soils are made, the value of humus, etc., and she should ever keep before the pupil the fact that the soil is the very foundation of everything, one of the greatest gifts from the Creator, and he is greatly honored who by care and thought is privileged to work with the Creator in the further building of soils.

The college professor should be most careful when the boy is passed on to him, that he teach him along broad lines which he personally knows to be sound, and that the young man's day of training may inspire him to study the why of things to the end that when in later years he is out in the sea of life alone he may be able to swim with boldness.

The local press of our State should be informed as to the relative value of first-class farmers as compared with other citizens—that they are the greatest need of any State where agriculture is the leading industry—and offer the young man who aspires to an agricultural life the same encouraging publicity as would be given the young man of the community who fits himself for the practice of law or medicine.

I would that we all might be able to get some idea of what is before this twentieth century farmer and be willing to do our share, not toward making his path easier, but toward training him to fight with power, that power which is founded on knowledge.

DOES IT PAY TO FERTILIZE?*

B. W. KILGORE.

Exclusive of cotton-seed meal purchased and applied direct by the farmer to the soil, there were used last year (1909) in this State 512,725 tons of fertilizer, worth at $20 per ton $12,254,500. The State's fertilizer bill this year (1910) will be between twelve and thirteen million dollars. Is this large amount of fertilizer used profitably, not only on the crop to which it is applied, but also to the future and permanent betterment of our lands? For any system of farming which does not have for one of its objects putting the land in such shape that it will produce more next year, under favorable seasonal conditions, than it did this, is not only unwise, but is as much a wrong and a sin as to knowingly bring up and train the generations for the future to have less vitality, strength and productive capacity than the present. Some say that there is too much fertilizer used, that it is a waste and a heavy tax on the farmers, without proper returns. Part of those who hold this view do so without much, if any, thought, and as a matter of the moment and for strengthening some argument, or proving specially advantageous some system of agriculture which they are advocating.

A fair and proper answer to this question is certainly one of the big economic problems in our farming. To some extent it is a question for each individual farmer, and it certainly is one which should be considered from the standpoint of each individual crop and soil type.

It is our purpose to deal with the subject from the standpoint of cotton, admitting and emphasizing that cotton is the staple crop which yields handsomer returns than any other grown in the State for proper feeding, and what I shall say will be based, in the main, not on guesses or estimates, but on actual yields or weights obtained in our experiments on the Iredell Test Farm near Statesville, where the soil is a red clay loam, and on the Edgecombe Test Farm, where the

*Address before the Farmers' Convention and containing the main facts in talks at Farmers' Institutes.

soil is a fine sandy loam. These soils, with those which are [illegible] related to them, are the main cotton lands of the State. The fertilizer used at both places contained 7 per cent available phosphoric acid, and $2\frac{1}{2}$ per cent each of nitrogen and potash. The results for no fertilizer and for different quantities of fertilizer were as follows:

IREDELL TEST FARM—(RED CLAY LOAM SOIL)—5 YEARS' AVERAGE.

Pounds Fertilizer Used.	Yield—Pounds Seed Cotton Per Acre.	Part Bale of 500 Pounds.	Average Profit Per Acre on Fertilizer.	Average Profit Per 100 Pounds Fertilizer.
0	176.6	.12		
200	656.5	.46	$ 16.00	$ 8.00
400	912.9	.65	27.59	6.89
600	1008.9	.72	32.30	5.38
800	1083.5	.77	33.84	4.28
1000	1180.9	.84	36.86	3.68

Average—5.63.

EDGECOMBE TEST FARM—(FINE SANDY LOAM SOIL)—7 YEARS' AVERAGES.

Pounds Fertilizer Used.	Yield—Pounds Seed Cotton Per Acre.	Part Bale of 500 Pounds.	Average Profit Per Acre on Fertilizer.	Average Profit Per 100 Pounds Fertilizer.	Average Part of Bale on Both Farms.
0	738	.52			.325
200	842	.60			.530
400	1120	.80	$ 11.45	$2.84	.725
600	1249	.89	17.04	2.84	.805
800	1472	1.05	25.33	3.16	.910
1000	1582	1.13	28.53	2.85	.985

Average.... 2.92
5.63

8.55=4.27 Average for 2 Farms.

These results show, among other things:

(1) That it pays better, from the standpoint of fertilizer, to fertilize poor or less productive land than it does rich or more productive land. The average yield of seed cotton per acre on the Iredell farm on the plats not fertilized was 176.6 pounds per acre, or .12 of a bale. This is poor land. The fertilizer used on this land gave an average profit for all the quantities used of $5.63 per 100 pounds, after paying for the fertilizer itself. Two pieces of land were used on the Edgecome farm in rotation, one being about three times as productive naturally as the other. On the poorer land the profit per 100 pounds of fertilizer, as an average of all the quantities used, was $4.93 per 100 pounds, and on the better land, $1.44 per 100 pounds, the latter being less than one-third of the profit on the poorer land. When the quantity of fertilizer reached 1,000 pounds, the yield on the two fields was practically the same, and were not far apart with 800

pounds of fertilizer. These results are given in detail below and are on basis of one acre:

Pounds Fertilizer.	Poor Land.		Better Land.	
	Profit Per Acre.	Yield Seed Cotton. Pounds.	Profit Per Acre.	Yield Seed Cotton. Pounds.
400	$22.48	1,022	$ 3.13	1,193
600	27.21	1,096	9.34	1,363
800	41.67	1,445	13.05	1,493
1000	46.80	1,587	14.81	1,578
Averages	$ 4.93	1,287	$ 1.44	1,407
0		339		1,045

The average profit from the use of fertilizer or cotton on the soils in the two sections of the State was $4.27 per 100 pounds of fertilizer and after paying for the fertilizer. It will, I think, be difficult to find a farm operation which will yield a higher profit than this shows for cotton. It is a case where after eating the cake more than *four* cakes have been left or produced; after paying for the fertilizer itself, more than four dollars profit have resulted for each dollar expended, and we know now that the fertilizer used, which we had to assume at the beginning of the experiments, was not the kind which would produce most profitable returns. What this fertilization should be for the most profitable production of cotton and the betterment of the land in the two sections of the State, are the subjects of Bulletins now being printed and soon to go out.

(2) The soils on which these experiments were conducted are not much, if any, better than the average cotton lands of the State, unless it be one of the fields on the Edgecombe farm, where there is perhaps a better subsoil than the average eastern lands have, but the second field on this farm has only an average subsoil. At any rate, there is an abundance of land as good and better than these in the State for growing our cotton crop.

The average yield of cotton on all the fields in seven and five years respectively was:

Without fertilizer ..... .325 of a bale.
With 400 pounds..... .725 of a bale.
With 600 pounds..... .805 of a bale.
With 800 pounds..... .910 of a bale.
With 1000 pounds..... .985 of a bale, or almost one bale per acre.

The average yield of cotton in the State last year was 228 pounds of lime, or .456 of a bale per acre. By using 800 pounds of fertilizer per acre, on basis of our tests, this yield could be doubled, or else produced on one-half the area of fairly good cotton land, as labor and trade conditions might direct. It is true that the land on which our work was conducted had good preparation and cultivation, good seed and good fertilization, but not as economical fertilization as we are and shall use in the future on our general crop of cotton. It is seen, however, that preparation, cultivation and seed will not take the place of needed plant food.

(3) In 1909 there were 1,359,000 acres devoted to cotton production in North Carolina. It is not known how much fertilizer was used as an average per acre, but I estimate 200 to 300 pounds. If 400 pounds per acre were applied it means that 53 per cent of the total fertilizer used in the State was for cotton. If 300 pounds, 39.8 per cent; if 200 pounds, 26½ per cent. If 400 pounds of fertilizer per acre were used it means that 271,800 tons were applied to cotton, and if the profits obtained were as large as those obtained in our experiments in the Pied-

mont and eastern parts of the State, the increase in the yield of cotton not only paid for the fertilizer used on the cotton itself, but also overpaid for the remainder of the fertilizer sold in the State for that year and used on all crops but this showing might, and we believe would, have been vastly better had heavier and better suited fertilization been followed. It required last year in this State 2.2 acres to produce a bale of cotton weighing 500 pounds against 2.9 acres to the bale for the entire United States. With lint at 13.2 cents per pound and seed at 45 cents per bushel (the figures used by the Census Bureau), each bale of cotton and the seed from it brought $79, making the value of the product of each acre of cotton in this State that year $36. On basis of our results for five years in the Piedmont and seven years in the east, an expenditure of $4 to $6 per acre additional for fertilizer would have produced double the crop, and in doing so would have added $20 to $25 per acre clear profit, as against a much smaller profit from a $36 crop. A procedure which would have produced still larger profits would have been the reduction of the cotton acreage by one half, using only the better land, putting on one acre the fertilizer which was applied to two, when we would, I think, not have missed very far the yield of cotton obtained in 1909 on one-half the area, and the land would have been left in better condition because of its better fertilization, as I will show later. As it was, 20 to 25 per cent of the value of the cotton crop in 1909 paid the State's entire fertilizer bill. Unfortunately no such profits come from the fertilization of corn, the grains and hay as from cotton. Cowpeas give large returns from proper fertilization, but not nearly so large as cotton, and each of these crops must be considered separately and in connection with our different type soils if we are to fertilize in the best way for obtaining most profitable returns, as well as for the improvement of the soil.

(4) Our tests have not been running long enough to enable us to speak with the definiteness with which we would like, but they indicated quite clearly that where 200 and 400 pounds of fertilizer respectively have been used per acre that the land has lost in productiveness and has not given the yields in later years that it did in the first ones. Where 600 pounds per acre was applied the land has barely, if it really has, held its own; while with 800 and 1,000 pounds respectively, per acre, there seems to have been a gain in productiveness. Except phosphoric acid, 200 and 400 pounds of the fertilizer used did not supply as much plant food as was removed in a bale of cotton, which was close to the average yield in all of the experiments; 800 and 1,000 pounds supplied a considerable excess of both phosphoric acid and potash, but there was still a shortage in nitrogen for one bale, even with 1,000 pounds.

One thousand four hundred pounds of seed cotton, with 35.7 per cent lint, would yield 900 pounds of seed and 500 pounds of lint; the lint and seed would contain in round numbers 30 pounds nitrogen, 12 pounds phosphoric acid, 13 pounds potash and 3.2 pounds lime. Only about fifty cents worth of these fertilizer constituents are carried away in the 500 pounds of lint; under conditions prevailing last year the seed can be sold for enough to purchase 100 per cent more fertilizer constituents than are removed by the seed and lint.

Nine hundred pounds of cotton seed at present prices for fertilizer constituents are worth $7.18 as fertilizer; 900 pounds of seed at 45 cents per bushel would bring $13.50, and at 50 cents, $15, which is more than double the fertilizing value of the seed. In other words, the seed can be sold for fifty cents per bushel, and twice the quantity of fertilizer constituents which they contain can be purchased in other materials for what they bring.

For the red clay and red clay loam soils we recommand a fertilizer which will contain 10 per cent phosphoric acid and 2 per cent each of nitrogen and potash. The materials for making this fertilizer can be purchased for about $10. For the sandy loam soils of the eastern part of the State we recommend a fertilizer containing 7 per cent phosphoric acid, 3 per cent potash and 3½ per cent nitrogen. The materials for making 1,000 pounds of this fertilizer can be purchased for $12. It is thus seen that the seed from a bale of cotton can be sold for more than enough to make a 1,000-pound application of good fertilizer per acre.

The balance of trade, so to speak, is seen now to be in favor of the cotton farm. Every advantage possible should be taken of this. For years live stock farms have helped deplete Southern cotton farms of their fertility. Unfortunately

it has not been the Southern cotton farmers' live stock but those of a few near-by neighbors and a great many far-off ones. Old England and the Continent, New England and the live stock States of the Middle West have obtained large amounts of plant food from our cotton soils, and much of the time at prices which would not return to the soil the amount of plant food material contained in other fertilizers and fertilizer materials purchased for use on the land. Conditions have now changed. Blood, bone and tankage are now coming back to us from the live stock centers at less prices for the plant food they contain than those commanded by like amounts of plant food in cotton seed and cotton seed meal, and the cotton farmer has his opportunity. If he will sell his cotton seed and buy its value in the right kind of fertilizer constituents for his cotton crop and his soil, protect the soil from washing, and leave the roots, stems, bolls and leaves on the soil, it will not be many years before it will be producing one and one-half (1½) to two (2) bales of cotton per acre, if exhaustive crops are not grown in rotation with it. If a crop of peas or other soil-improver is grown every third or fourth year and left on the land this high state of productiveness will be reached much sooner. Corn, which draws much more heavily on the land than cotton, has been grown between the crops of cotton in the work, the results of which have been made the basis of this discussion, and but for this it is likely that a more favorable showing would have been made.

Vegetable matter is of great importance in growing cotton, but little credit is and has been given to the vegetable material which comes from the cotton crop. The roots, stems, bolls and leaves corresponding to 500 pounds of lint cotton are around 3,145 pounds, or more than 1½ tons, containing—

67.7 pounds of nitrogen,
26.5 pounds of phosphoric acid,
50.3 pounds of potash,
59.3 pounds of lime,

or the equivalent of five tons of good manure. These alone add largely to the humus supply of the soil, and if the 900 pounds of seed, corresponding to 500 pounds of lint, and which are the equivalent of two or three tons more of good manure, from the standpoint of the fertilizer constituents which they contain, are returned to the land themselves, there is added to the soil each year over two tons of vegetable matter per acre, yielding one bale of cotton to the acre. If these seed are used as they should be in purchasing 100 per cent more than their worth in other fertilizer constituents, we have emphasized in the most emphatic way the cotton farmers' opportunity for producing larger and more profitable yields of cotton each year, and at the same time adding not only to the productiveness of the soil, but to its permanent store of plant food.

HOME-MIXED FERTILIZERS.

T. FRANK PARKER.

Before taking up the discussion of fertilizers proper, perhaps it will be well to say something as to why we use them. I dare to say that many farmers are not sufficiently acquainted with the elements of plant food in fertilizers to know what they are getting when they buy it. It is well for us to remember that less than ten per cent of the weight of our crops comes from the soil proper, the rest coming from the air and water. This may be shown if a log which requires a heavy team to haul is burned, we can easily carry away the ashes in a basket without effort, and the ashes contain the elements of plant food that come from the soil proper. Therefore, we find that in the case of trees only a small per cent is mineral or ash matter. Likewise the mineral plant food that comes from the soil in producing ten tons or two hundred crates of cabbage, would be only about two hundred pounds. So we find that soil plant food does little more than to act as the skeleton, or enough to hold the plant upright.

Soil is the mixture of disintegrated rocks and rotten vegetable matter. It is the great graveyard of nature, to which all things must return, and yet from which springs forth again the food of all vegetable and animal life.

It might be of interest to know how these elements are liberated or supplied to the soil, but that is another subject; so suffice it to say that the order in creation is, that the rocks supply the minerals; plants feed on these minerals; animals feed on the plants; while omnivorous man, lord of all, feeds on both animals and plants.

With these forewords it is hoped that we may better understand the more important matter which follows:

There are fifteen elements which are found in the composition of plants, and ten that are essential for their proper growth. But it has been found, after years of experience, that the soil contains a sufficient supply of seven of these, that are available to plants, which leaves only three about which we farmers should be concerned, and should be much concerned about, too, for on these the plant is dependent for growth and fruit. These three plant foods are phosphorus, nitrogen, and potassium. Some claim that lime is needed, but experience indicates that it acts on the soil rather than by supplying a plant food. Yet on some soils an application has proven to be profitable.

We know that some soils have sufficient amounts of one or more of these elements that are available for the plants to utilize, consequently it would be waste of time and money to supply more of these to such soils. But there are few lands that will not be benefited by at least a small application of each of these three elements. But to find out the needs of your soils in this respect you need to test your land *yourself* with the different fertilizers. You may then judge from the growth and yield of the various plats as to the needs of your soil. But do not fall into the mistake that what one field needs all need, because any one knows that a single field often has several types of soils in it, and so for best results each type should be tested as above mentioned.

1st row, no fertilizer 2nd and 3rd, Phosphoric Acid	Phosphoric Acid.
4th row, no fertilizer 5th and 6th, Phosphoric and Nitrogen	Phosphoric Acid and Nitrogen.
7th row, no fertilizer 8th and 9th, Nitrogen	Nitrogen.
10th row, no fertilizer 11th and 12th, Nitrogen and Potash	Potash and Nitrogen.
13th row, no fertilizer 14th and 15th, Potash	Potash.
16th row, no fertilizer 17th and 18th, Phosphoric Acid and Potash	Phosphoric Acid and Potash.
19th row, no fertilizer 20th and 21st, Phosphoric Acid, Nitrogen and Potash	Phosphoric, Nitrogen and Potash.

This experiment may be duplicated by using each element in varying quantities. The rows giving best crop returns will show what fertilizers the soils need and which it will pay best to use. The soil should be about the same in all of these plats, so as to give uniform results. It is generally known that phosphoric acid is the only form in which phosphorus is available to plants as a food. And potash is the common name given to the forms of potassium that are available to plants.

Let us consider barn manure in comparison with commercial fertilizers. One important difference is that commercial fertilizers as a rule come from mineral origin, that is, they are mined from the earth, while barn manure is the decomposed vegetable matter. This difference, then, would indicate that commercial fertilizers (commonly called) contain little or no humus, excepting those that get nitrogen from organic matter, consequently would not improve the physical condition of the soil like stable manure would. While on the other hand commercial fertilizers are more concentrated, and are preferable for that reason. Live stock take out about one-fourth of the elements of plant food composing the average feed stuffs, therefore three-fourths is returned to the soil in a state of decomposition. The essential difference, then, between these two forms of fertilizers is that one contains more water and waste but more valuable humus, while the other is more concentrated in mineral plant food with comparatively no humus. One tends more to build up the land for future crops, while the other gives immediate results.

But as my subject is intended more for the mixing of commercial fertilizers than about barn manures, I shall leave this important subject for others to discuss. Suffice it to say that where the best agricultural prosperity reigns, there one will always find live stock.

Another mode of fertilizing the soil that is very important is the growing of legumes. By doing this the expensive bills for nitrogen may be partially or entirely done away with and the physical condition of the soil improved at the same time; for these crops not only supply nitrogen but also humus to the soil.

We find that in the same way that animals and plants must be fed well to give us good service, likewise our soils must be treated for good returns. Yes, we must feed the soil and not always expect the feeding to go in one direction. Treat our fields like our work stock, in the sense that they must be fed for good service, and we will find this the most profitable investment a farmer can make. We must spend our energy and money in improving our poor soils if we expect the increase to be many fold.

Let us consider these plant foods that are usually lacking in the soil. These three elements are deficient largely because they are drawn on more heavily by the crops than any others, and this being the case, we should know them better.

Phosphorus (better known to the farmer as phosphoric acid because it is available to the plant in this form only) hastens the maturing of the crop as well as increases the yield.

Nitrogen causes a heavy growth of the plant, giving it the rich, dark-green color and heavy stalk. Sometimes this is at the expense of the yield.

Potassium increases the yield, but has a tendency to retard the maturing of the crop.

Whenever a heavy, green growth but poor yield is found, one may reasonably assume that phosphorus and potash are lacking. If the maturing of the crop is slow, that likely indicates a lack of phosphorus. If there is a tendency for heavy yield but a small body and growth with perhaps a sickly color, nitrogen is probably lacking.

As was stated before, the best way to know about the needs of our soils is to experiment ourselves.

Oftentimes farmers are fooled in buying fertilizers. For instance, Mr. Farmer comes into town and asks his dealer for prices on corn fertilizers. He is given several high-sounding names that really have no meaning. After studious consideration he selects the one with the price that suits rather than the one containing the greatest food value. Pay no attention to the name but to the analysis. It is full time for us to know why and how fertilizers are prepared, and this known we will become more interested in them and realize that by buying the separate ingredients and mixing them at home we may not only prepare any desired analysis but as many and as much of each as is desired. This work may be done rainy or otherwise disagreeable weather when little other work would be done. This will mean a great saving of time and money. Let us consider the advisability of buying ready mixed fertilizers or mixing them ourselves. For illustration we will use the ordinary 8-2-2 grade. There may be some who do not fully understand the meaning of these figures. The first one indicates the

per cent of available phosphoric acid, the second and third the same of nitrogen and potash, that is contained in the mixture. The second or nitrogen figure often causes confusion, but the laws of our State require that the nitrogen equivalent be included with the analysis. For instance, in most of the ordinary 8-2-2 goods the nitrogen is not two, but only 1.65, per cent; the two in this case would mean ammonia instead of nitrogen. We should speak of the nitrogen percentage rather than of the ammonia, for the plant does not feed on ammonia but in some other form. The relation of nitrogen to ammonia is 14-17, or by adding 1-5 of the nitrogen content to itself for ammonia and by subtracting 1-6 from ammonia for the nitrogen equivalent.

For an example the following ingredients, subject to varying prices at the different markets, may be used to work up a fertilizer:

16 % Phosphoric Acid	@	$15.00 per ton.
15.5% (N) Nitrate of Soda	@	50.00 per ton.
14 % (N) Blood	@	60.00 per ton.
50 % Muriate of Potash	@	40.00 per ton.

For the 8-2-2 we have $\frac{8\text{-}2\text{-}2 \text{ lbs. in } 100 \text{ of the mixture available.}}{20}$

160-40-40 lbs. in one ton of the mixture.

If we need 160 pounds of phosphoric acid to be gotten from the 16 per cent goods it will take as many pounds as .16 (per cent) is contained into 160 which will give 1,000 pounds. Likewise with the nitrogen needed, only in this case it is advisable to use ingredients that become available to the plant as it is needed. For this purpose we use both quickly available and less readily available materials. In the example given we divide the 40 pounds needed between soda and blood using 20 of each. Continuing this plan we have the following:

1,000 pounds 16 % Acid Phosphate=160 pounds Phosphoric Acid	@	$ 0.75	=	$ 7.50
130 pounds 15.5% Nitrate Soda = 20 pounds Nitrogen	@	2.50	=	3.25
140 pounds 14 % Blood = 20 pounds Nitrogen	@	3.00	=	4.20
80 pounds 50 % Muriate of Potash = 40 pounds Potash	@	2.00	=	1.60

1,350 pounds mixed on the farm.	Cost	$16.55
2,000 pounds mixed at the factory.	Average cost	21.00
650 pounds difference (filler).	Difference in cost	$ 4.45

As will be seen in the above, there are 650 pounds of filler which has no fertilizing value and is only for additional weight. Use no filler in home mixed goods. For instance, in the above fertilizer we would use 1,350 pounds instead of a ton, or we would use 2-3 of the weight of the home mixed goods that we would of the commercial goods of the same analysis.

Besides the cost and weight saved, there are other things to be considered. Extra sacks must be paid for to hold this *filler*, the freight must be paid on it, the factory has to buy it, and of course the farmer must pay for it; it must be hauled oftentimes considerable distances, which requires extra effort, expense, and time. It is a feature of business principles that when any appreciable amount of money is saved in a purchase it is equivalent to that much made. The farmers who realize this principle and practice it are the ones who are becoming leaders in the farming world. Why do the best farmers house and care for their working machinery and tools, use plenty of oil on them when at work, and save feed by careful feeding, etc.? It is because it saves expenses. It is money made.

It pays to use high-grade fertilizers, it pays to know fertilizers, it pays to know the needs of soils and plants. It pays for all of us farmers to take the farm papers and to study others' experiences and to take some of their suggestions into our own operations. There are many books bearing on this subject that are of great value to farmers. It will pay to procure some of these and study them.

PREPARATION OF THE SOIL AND PRODUCTION OF CORN.

A. CANNON.

The essential points of corn production are the thorough preparation of the soil, cultivation and proper selection of seed. All lands should have plenty of humus or vegetable matter when planted in corn, and that humus should be from barnyard manure and leguminous crops, such as clover, peas, vetch and soy beans, these furnishing a large amount of nitrogen from the air, saving the farmer to a large extent from buying the most costly ingredients of all fertilizers. While the leguminous plants are great aids in bringing up the soil and holding its fertility, there is nothing that will excel the old stable manure, which supplies the humus and the other fertilizer ingredients and lasts longer. By using the stable manure on the intensive system, and using the leguminous crops as a cover crop during the winter, sowing them when the corn crop is laid by, we can double and triple the crops, and by proper rotation keep the land in a high state of productiveness. In a personal experiment made upon my own farm in 1897 upon the above plan I had six acres of upland I planted in corn in 1895, and only made twelve bushels per acre. In 1897 I plowed the land ten to eleven inches deep, then broadcasted twenty two-horse wagon loads of manure per acre in April and harrowed thoroughly with a disk harrow, and at gathering time harvested sixty-four bushels per acre of fine merchantable corn. That land to-day is in fine condition and will yield from seventy to seventy-five bushels of corn per acre, with a very small amount of manure applied since the first application. After the soil has a good supply of humus it should be plowed as deep as possible, not less than ten inches, and if possible fifteen inches, in late winter or early spring. All lands should have a cover crop during the winter for the reason that the nitrogen escapes from the soil and the soil deteriorates in productiveness. By deep plowing the top soil is mixed with the subsoil, and you increase the productiveness by deeper soil from year to year, and increase continually the yield of the land. The rains which follow the deep plowing will be retained to a large extent, protecting the land from washing and also supplying moisture in a dry season. As soon as possible after land is plowed it should be thoroughly harrowed with a good harrow, such as a disk, so as to prevent drying out and leaving the land cloddy. The best on red clay soil would be to harrow in the evening the land broken in the early part of the day. The farm lands of North Carolina in their virgin state were well supplied with humus and potash and produced fine crops. The farmer now must supply what nature originally supplied. Our grandfathers received the cream and left us the whey.

The cultivation of corn should receive the undivided attention from planting to laying by. After planting a weeder or small drag harrow should be run over the land—keeping the land in a loose, pulverized state. This plan should be carried out with the weeder after the young corn is from five to eight inches high, killing all the young grass and weeds and keeping the top soil in a pulverized condition. After the corn has grown higher use the plow by shallow plowing. No plow should be allowed to go over four inches deep during the cultivation of corn, for the reason that the young roots running out from the stalk have a depth of from five to six inches and extend across the row. If these roots are broken it injures the growth. All the main leading roots have a large number of small fibers or feeders absorbing the fertilizer ingredients from the soil. This plan of cultivation I have adopted for years, and the results have proven to me the wise one to use in corn cultivation. If you expect to reap a full harvest all corn should be cultivated level.

The selection of seed is an important matter that all farmers should consider. He should have his mind made up as to the kind of corn he wants, whether large, medium or small cob, grain deep with large heart of the Dent variety, or large glazed grain with medium heart, a red or white cob, then take the most perfect ear that you can find. Go through the field and make your selection to correspond to the one selected; when you find one that corresponds to the type chosen

tie a string around it or mark it in some way so you will not loose the ear. Do not pull any fodder from the chosen stalk as you want as well matured seed as possible. If you are not satisfied with your selection when husking time comes, make another selection for the same type as you did in the field, selecting twice the amount you expect to plant, and from that select your seed for the coming crop. If you want a pure white corn select the seed with a white cob as corn with a red cob has not the white cast the white cob has. Seed selection being so important a part in the production of corn, we should take a small amount of land, highly manured or fertilized, and plant for seed purposes, letting the corn stand without stripping the fodder until gathering time, then you have a strong, vigorous and well-matured ear. When you begin to shell your seed corn (shell by hand) shell off a part of each end and use that for feed, taking the largest and most vigorous grains for planting. By following this method you will double the yield of your crop in a few years. If you buy seed corn take it only in the ear, as there is so often fraud practiced on the farmer in defective seeds. By following the above plan from year to year your ears will in a few years increase in weight 40 to 50 per cent, and instead of having to take 120 ears to the bushel, as was the custom twenty-five years ago, you can select plenty of ears which will weigh a pound to the ear. I know this to be a fact as I have individually tried it, and can demonstrate it in my crib.

Some agriculturists contend for low ear and stalk. I say from experience the stalk should be what some call high, the ear not less than five feet high, the stalk strong and large with large braces to support it. No one should plant any other kind on our bottom or lowland, which is subject to overflow, as the ears are above the water and the corn will not injure by souring after being overflowed. I have just gone through a trial from last month (August) high water and my corn is all O. K. while some of my neighbors are badly hurt by having low corn.

I am giving my individual experience in this article and not writing from a theoretical standpoint. Every farmer should be to a certain extent an experimenter in his work. It is his duty to take all the BULLETINS issued by the Department of Agriculture and study them and see if he can not improve his farm and also improve on the subject being discussed, and notify the Department of Agriculture by writing an article on that particular line, giving his individual experience, and by so doing he will show to the people the great work which is being done by the Agricultural Department. The Department of Agriculture is a State-wide school on agricultural lines; the various object lessons that are being given by the experimental farms along all agricultural, horticultural and veterinary lines, as well as the field work in a number of counties; the institute work all over the State where the farmer and his wife can learn from scientific and practical men and women how to apply science practically to their farms and homes. If the farmer expects to succeed in the advancement along agricultural lines he should, with his family, attend every Farmers' Institute held in his county or section.

REFORMS NEEDED ON THE FARM.

E. S. MILLSAPPS.

Friends and Fellow-Farmers:

I am glad to have the opportunity to talk to you for a short while on a subject of interest to all mankind. In the beginning let me say that we are at the turning point in the history of Southern agriculture. For a hundred years or more we have been engaged in a system of soil robbery that, but for our unsurpassed climate and natural resources, would have brought poverty to any people. The South is said to be poor, and reviewing the history of Southern agriculture is it any wonder? When the South was first settled we had great areas of magnificent forests and millions of acres of land as fertile as the sun of heaven ever shone upon. The first thing our forefathers did was to cut off and destroy the forests and get into cultivation some of the fertile land that was so abundant

at that time. This land was cheap—its money value was almost nothing—and as soon as a field ceased to produce satisfactorily it was thrown out and more timber was sacrificed to bring into cultivation new land, to be treated in the same way. So year after year this system was kept up. Slavery had something to do with such a system of destructive farming. The negroes had to be kept at work, if their labor was to be profitable. So each winter saw large areas of timber land cleared and brought into cultivation to be robbed and butchered as the other had been. Then came the Boy Dixie to complete the work of destruction. The land was plowed two to three inches deep, and the heavy rains carried the soil away as fast as it could be plowed up. This system, if the utter lack of system may be called such, grew into our people, generation after generation, with little or no thought of soil improvement, until the time came, as it comes to all spendthrifts, that the "system" must be changed. The time has now come when this must be changed. Let us remember that North Carolina must be the home of millions of people, and that this very soil which we and our forefathers have robbed must produce them a living. God Almighty gave us this goodly land. What shall be the account of our stewardship? Shall our farms be handed down to our children so impoverished that they can not make a living on them? It is a matter that stares us in the face with stern reality. You must permit me to talk plainly. Being a farmer myself I must be permitted to say some things that are rather hard on us, but they are true nevertheless. The farmer is not a business man, has not been in the past, but he is doing better now. When we as farmers learn to use our brains more and our hands less, or rather, when our hands become more skillful on account of the exercise of more brain power, more thought, more studying out of the details of our business, then we shall begin to make things come to pass. When farmers as a class learn to apply the same business acumen, sound reasoning and good judgment to the problems that confront them that the business man exercises in the conduct of his business, the same success will reward his efforts. Yes, I say emphatically that the farmer must learn to be a business man.

Our State and national departments of agriculture are becoming alarmed at the depletion of soil fertility, which has resulted from methods of farming in vogue in the past, and they are now making every effort possible to put into effect other and better methods, such that the farmers and their families may not only make a living but at the same time may so enrich their soil that permanent prosperity may follow. This is the problem before us. How may it best be solved is now the question.

We are told that the corn crop of the world was, last year, about 3,300,000,000 bushels, and that the United States, the greatest corn-producing country of the world, produced 2,767,000,000 bushels. This is an enormous amount of corn, but it is not the largest crop our country has given to the world. Our corn crops have been increasing from year to year by reason of the fact that we have been able to increase our acreage as our population increased, but this can not continue indefinitely. There must necessarily come a time when our acreage can not be extended, and it is against this time that our people must be prepared to feed the increasing population by multiplying the productive capacity of each acre. In another hundred years we shall have 200,000,000 people to feed, besides the live stock that must necessarily be kept on the farms. The enormous crop of last year makes a per capita production of only about thirty bushels, and if our present methods continue it will only be a question of time when we shall fail to produce our bread-stuff, and then where shall be turn for our supplies? The balance of the world produces only about one-half of one bushel of corn per capita. So, so far as corn goes, we need not look to other parts of the world for that. The wheat crop is even smaller than the corn crop. Therefore, without entering into a discussion of international economics, I say we must produce the food for man and beast, and, as we have seen, if we can not increase our acres we must, by better methods of tillage and soil management, increase the capacity of the acres we already have. This is not the only question we must consider—we of the South. We must look to our own welfare against the North and West. The South has the greatest money crop of the world, and we have practically a monopoly of that crop, but so long as the South fails to produce the corn and wheat, hay and meat necessary to feed her people and stock, just so long will

the South be poor, and this is true, more especially, because these "supplies" are purchased from the proceeds of one crop. This is the truth we are endeavoring to drive home, and we would that we could do so with sledge-hammer blows. No people can succeed long and depend upon one crop, for certainly in the end it will redound to their undoing, the impoverishment of the soil, which is the greatest calamity that can befall any people. We are told that the cotton crop of North Carolina amounts to thirty-five or forty million dollars annually, and that the only portion of this enormous amount of money that remains to the credit of the State is the percentage the merchants get for handling Western "food supplies." Now it takes hard work and lots of it to raise the cotton to get that much money, and then it is hard to see it leave the State to purchase products which it has been demonstrated can easily be grown in the State. Some of the largest crops of corn ever produced have been grown right here in North Carolina, and why not? We have the climate and the soil, too, if we as farmers do our duty by it. No soil in the world responds more readily to the kindly touch of the wise husbandman. It has been proven that we can grow corn at a cost not beyond the freight we pay on the corn we purchase from the Western farmer. If he can produce corn and sell it to us and make a profit, why can we not produce it at home and keep the money here to build up our own resources, educate our children, construct good roads and build up our cities?

Now is it worth while? I ask each individual if the task we have set for ourselves is worthy of accomplishment? It becomes an individual matter. Each man must do his part, and no man must be a shirker.

Now it may be said that I am dealing in glittering generalities, and that there is nothing practical in them. I ask whether it is worth while for a farmer sometimes to think on a little broader line, to become a bigger man in the world of thought, and to be more of a factor in the world's business affairs? To be plain, friends, how many of you know a good many practical things which you are failing to do? There are very few farmers now who do not know better than they do. A goodly number of farmers are yet abusing the so-called "book farmer," and yet crops will somehow grow better for the "book farmers" than for the other fellow. Then why lag back and follow in the wake of the great agricultural awakening that is surely coming. There are farmers now tilling the soil in the old slipshod, haphazard way, who will live to see the day when they will be doubling, yea quadrupling, their present yields. This is not foolishness. I have seen it done and you have too. The day will come to our good State when we shall be ashamed of the record we are now making as farmers, an average production of fourteen bushels of corn per acre for the whole State. I speak of corn because I regard corn as our greatest crop, and because of the further fact that where good crops of corn can be grown, or poor ones for that matter, it is a good index to the character of farming that is being done.

Now, friends, I have said these things that you may begin to think about them. We must be broader, bigger men if we are to solve the problems that confront the farmers of the future. It requires more thought, keener judgment, closer application to strictly business methods, to be a successful farmer, than for any other calling or profession. The farmer has not only the ordinary financial problems, but various conditions of soil, of weather and climate, the selection of seed, the breeding and growing of live stock, rotations, harvesting and marketing of crops. In addition to this, he must be a close student of economy. He must know not alone how to market his products well, but he must know how to produce them at the least expense. This brings me to consider the economy of farm management. To produce crops economically we must have good stock and tools, and to be able to use tools on a farm to good advantage it is necessary to have the land cleared of roots and stumps, and the fields must be put in the best shape possible. There are many farms where a little work in shaping up the fields would pay handsome profits by enabling the farmer to do more work and better work. The gullies should be filled up, the plum trees grubbed out by the roots, and the briars and bushes around the corners cut off so that the big plow, the mowing machine and the binder may do their best work. The farm roads should be laid off so as to interfere as little as possible with the shapeliness

of the fields, and the fields should be arranged so that the rotation of the crops might follow easily and naturally, and, in the arrangement of the farm into convenient fields, due regard should be had for the pasturing of live stock, for the farmer who neglects this invites failure, to a certain extent, because there is no system of farming that can be permanently successful without live stock.

Now, friends, let us, one and all, do all in our power to hasten the coming of this new day in our farming conditions. Let us raise our own "supplies," and keep at home the millions of dollars we are sending to other States, and thus become a rich and prosperous people.

PEANUTS.

HARTWELL SCARBOROUGH.

The writer can not undertake to give specific and ironclad rules for the cultivation and marketing of peanuts, for, like all other farm crops, local conditions influencing this crop differ. But we can study and learn some principles which, when studied and applied intelligently, will lead us to success in handling profitably this valuable Southern crop. The peanut industry is yet in its infancy, so to speak, for only since the Civil War have peanuts been grown and handled on any large commercial scale. And even now the bulk of the crop is used as human food, largely sold by the vendors in the form of parched nuts and in candies. Several years ago (the latest figures are not at hand) 95 per cent of the peanuts consumed east of the Rockies were produced in eleven counties of Southeastern Virginia and Eastern North Carolina.

The value of both the nuts and the vines as stock feed has just begun to be recognized, and in the near future there must necessarily be an increased demand and an added line of profit to this crop used as a feed for stock. The great fattening qualities of this crop are known by all pork fatteners in the peanut belt. The hay from the vines of the peanut ranks with the clovers. The peanut belongs to the legume family, and when hogs are allowed to harvest the crop, thus leaving the vines and roots upon the soil, they improve the land and rank right along with the cowpea and the clovers and other members of the same family. Of course if all vines are removed and peanuts planted successively on the same field the land will become impoverished.

The varieties of the peanut are several. Some of the leading varieties are the Spanish, Wilmington, Virginia Runner, Virginia Bunch, North Carolina Bunch and Tennessee Red. The Tennessee Red is not grown to any great extent in this State, and is not considered a desirable peanut by "the trade."

The remaining varieties divide themselves into two classes, the "Bunch," growing somewhat in an upright position, with the fruit clustered on the "limbs" around the tap-root, and the "Running" varieties, which trail along the surface of the soil and have the fruit at the joints along these "limbs" or "runners." The Spanish, Virginia Bunch and North Carolina Bunch belong to the "Bunch" or upright growing class. The Virginia Runner and Wilmington belong to the flat growing or trailing varieties.

The Spanish is used largely for "shelling stock" to go into the manufacture of candy. The others are used largely for what is known as "the trade," and are sold largely in the form of parched peanuts for human food. These are also used to feed the monkey and the elephant at the circus. Seed selection of peanuts has not received the attention which some of our field crops have received, and there is room for great improvement along this line by selecting from the field the best individual plants. The soil adaptation of this State for peanuts is much wider than the popular belief would indicate. The peanut, like cotton, is a hot weather or heat-loving plant, and can be grown on almost any soil upon which cotton can be grown. Of course the whitest, most attractive hull is grown on the lighter sandy soils, but some of the largest yields are made on soils underlaid with clay.

A good rotation is, perhaps, more important, where peanuts are to be a part of the system, than in most crops, because of the tendency to feed the vines from the land, thus removing practically all the vegetable matter from the soil. Soils constantly robbed in this manner, without some system of rotation to replace this vegetable matter, would decrease in fertility. In a good three or four-year rotation, using cowpeas, clover and other legumes, leaving a good portion of vegetable matter in the soil, peanuts need not impoverish the soil, even when nuts and vines are removed.

The preparation of the soil for peanuts should be thorough, as in other crops. Time spent with plows and harrows to get the soil in a fine, pulverized condition before the seed are planted always starts the crop to better advantage and makes the subsequent cultivation much easier and less expensive. It has been my experience that flat planting and level cultivation is preferable, being less expensive and yielding better results. Yet some of our good farmers differ with me here and still plant on a ridge, and follow somewhat the method known as "ridge" cultivation. The peanut is, compared with cotton and tobacco, an easy crop to cultivate. The weeder, used often and at the proper time, that is, before the young grass and weeds get a start, is a very satisfactory implement to aid in the cultivation of peanuts, and helps greatly towards eliminating the hoe. If the ground is well prepared before planting, and the cultivation is frequent, one chopping is usually sufficient; but if the soil is not stirred often, so as to destroy young weeds and grass while quite small, more than one chopping will be necessary. One great advantage with the peanut plant is that being slightly covered with dirt does not hurt the young plant, but in a few hours it pushes its way out and grows as well as before.

The peanut is a great lover of soil that has been well limed. To make the larger varieties successfully a good quantity of lime is necessary, either naturally in the soil or supplied by the grower. The quantity to apply to the acre depends entirely upon the individual condition of the soil in question. As a rule the more humus in the soil the more lime can be used profitably. Anywhere from 200 to 1,000 pounds to the acre may be used, depending upon the condition of the soil in question.

Potash and phosphates are also very beneficial to this crop. On land producing a good-sized vine the use of nitrogen or ammonia will not be found profitable in most cases. The matter of lime, potash and phosphates is of so much importance that it would be wise for those not having grown this crop (and for many who have grown it also) to write Dr. Kilgore, the State Chemist, and tell him the nature of your soil and he will be able to give valuable information along this line.

Land plaster, or sulphate of lime, is applied to the crop at the rate of from 200 to 300 pounds to the acre, just as the plant gets started to fruiting or "pegging," as the farmers say. This plaster causes the peanuts to fill out well in the hull or prevents "pops," as we call hulls without fruit in them. The chemists tell us that the purpose of this plaster is to make quickly available the elements the plant needs at this stage.

The harvesting or "digging" of the crop is commenced when the larger number of pods on the vines have reached maturity. There are several usual indications of this stage. The lower leaves usually begin to shed, the leaf and limbs show dark spots, showing that the plant has about completed its growth. The surest test, however, is to pull up an average vine and examine the stems connecting the fruit with the vine. If the stems on the most mature pods are dead and have somewhat the appearance of a wet paper string the plant has reached its maturity, and the sooner the crop is dug the larger per cent of the pods will be saved. Sometimes growers allow them to "shed" some of the oldest pods in order to have some for the hogs to consume, more than would be otherwise left in the ground by the usual operation of digging.

The operation of "digging," as usually understood by the grower, includes the whole process of ploughing up, shaking out the dirt and stacking around poles six or seven feet high above the ground. The tap-root of the plant is cut just below the nuts by running under the plant with a one-horse turning plow with the wing removed, the point being made longer towards the outer edge by fastening a piece of steel, sharpened, so as to cut the tap-root. Some use what is

known as a peanut-point, moulded by the plow-makers for this purpose. After the plow come the shakers who take or lift the vines from the soil and shake a large part of the dirt from the fruit and the vines. After the vines have lain in the sun for several hours they are placed in a circle around the poles, set upright in the ground. A slat (sometimes two slats) is nailed about ten or twelve inches from the ground onto this pole to prevent the peanuts from touching the soil. The stack is started by placing the vines, pods pointing inward, in a circle about this pole, the slat furnishing the starting point. When the stack has reached a point where the top is difficult to reach by the stacker it is "drawn in" and some of the vines or a bunch of grass tied around the pole to prevent rain water from running down the pole. After the peanuts have remained in the stack long enough to dry or cure out sufficiently to rattle in the hull, they are ready to be picked from the vines, either by hand or by the different pickers or threshers on the market for that purpose. Most of the Spanish crop is threshed by the old-style peanut thresher. The great bulk of the larger varieties are picked by machines of more recent invention. "The Benthall" picker and "The Ferguson" picker are the two best known and most widely used in the "Peanut Belt." Both of these machines are manufactured at Suffolk, Va.

Peanuts are marketed by the grower in bags holding from 85 to 100 pounds, according to the class and size of goods, and are sold by weight.

The future of the peanut industry appears to be a bright one, especially as their value as a food for stock, as well as a regular part of human diet, is becoming better known.

Any one writing to the National Department of Agriculture and to the North Carolina Department can obtain a Bulletin from each, giving much valuable information about the growing and marketing of peanuts.

IMPROVED FARM METHODS AS PREVENTATIVE FOR INSECT PESTS (ESPECIALLY WITH REGARD TO COTTON AND CORN).

FRANKLIN SHERMAN, JR., ENTOMOLOGIST.

INTRODUCTON.—In many counties in North Carolina the chief crops are cotton and corn, these two being grown in rotation, or often not with any particular reference to rotation. Cowpeas are commonly grown in the corn.

Where the number of staple crops grown is thus confined to only two or three it is evident that the areas devoted to each crop must be relatively large, hence in many of our eastern and southeastern counties fields of cotton of 40 to 100 acres are not at all uncommon, and the areas devoted to corn are often nearly as large.

On these crops insect pests of many kinds do more or less injury each year, but so large is the acreage involved and so low the margin of profit that it becomes impracticable to adopt measures like spraying, dusting or plant-by-plant inspection to seek out and destroy the offenders. On such staple crops, grown in large areas, we must depend chiefly on methods which will lessen the probability of attack, or enable the crop to outgrow any slight injury which may be inflicted.

Therefore in this discussion I shall refer, not to methods which are directed merely at the insects themselves, but to methods which stimulate and help the crop *anyway*, and which at the same time have a detrimental effect on the insect pests.

1. DRAINAGE.—In all parts of North Carolina there are lands which fail to produce the crops of which they are capable from lack of drainage. It is not my purpose to discuss *how* to drain lands, but I can say most positively that certain pests like cut-worms, bud-worms in corn, and especially bill-bugs on corn, are always worse on poorly-drained lands. If, therefore, a good system of drainage will benefit our crops anyway, and *will at the same time lessen the damage from these pests*, it becomes worth our while to consider it and put it in effect when possible.

2. SELECTION OF LANDS FOR PLANTING.—Of course we can not always have free choice as to exactly *where* to plant our corn or our cotton—we have to fit these

things according to our scheme of farming, according to the crops that have preceded and the crops which are to follow. But where we can have some choice in the matter it will pay us to remember that *lowlands are always worse infested with cut-worms, bud-worms and bill-bugs than are high lands.*

3. EARLY BREAKING AND THOROUGH PREPARATION.—If we break our land late in spring, waiting as late as possible before planting time, we do not have time to give as good preparation as is desirable, the land does not have enough time to become aired and weathered, and whatever vegetable matter (humus) is turned in does not have sufficient time to decompose. Hence in all these things we will benefit by breaking the land early, in winter or very early spring, *and by so doing we at the same time starve and drive away innumerable cut-worms, which would otherwise do damage.*

If the land be broken early we can give it extra good preparation for the crop, working it into fine, mellow condition so that there will be a fine seed-bed. And all the extra working that we give it in preparation for the crop *helps to drive away the cut-worms and other pests which may already be in the soil.*

4. TIME OF PLANTING.—The exact time of planting of corn has much to do with injury by bud-worm. In the cooler parts of the State, and especially in the clay bottom lands of Piedmont North Carolina, early planted corn suffers most, and in those sections the *best way of avoiding bud-worm is to plant the corn moderately late*, and all through the early season be giving the land as thorough preparation as possible, so that when it is planted it will have every chance to sprout quickly and grow rapidly. On the other hand, in the warmest sections, in extreme eastern and southeastern parts of the State, *the best chance seems to be to plant a little early and thus get the crop started ahead of bud-worm.* These are points worth considering, for bud-worms destroy a great deal of young corn in the State every year.

5. AMOUNT OF SEED.—Replanting of corn or cotton is always unsatisfactory. Even if it enables us to get a stand (which it does not always do) it gives us a spotted and uneven crop at best, which is liable to serious injury by the earliest frost in fall. Therefore it is well to remember at planting time that cut-worms, wire-worms, bill-bugs, bud-worms, root-lice and other pests are apt to destroy a certain number of the young plants anyway (especially on low lands), and remember that *it is always more economical to plant an excess of seed, and thin the crop to a proper stand after these pests have done their part*, than it is to replant in order to get a stand. Hence it may be the very best of policy, when planting in a field which we know to be infested, *to plant an excess of seed so as to have a stand left in spite of all that these pests can do.*

6. FERTILIZATION.—Most of us realize that some knowledge of fertilizers, their composition, action and effects is necessary in order to use them to best advantage. Fertilizers may also be used in such a way as to lessen the destruction by insects. Kainit used in fertilizer helps considerably as a protection against cut-worms. Nitrate of soda, on account of its quick action, will often enable young cotton to outgrow the attack of root-louse. All that we can do to stimulate the cotton to mature its crop *early* not only saves the crop from frost, but also helps to protect it from the ravages of boll-worm, which is always most destructive on the late-maturing cotton. In the States where boll-weevil is now present the cotton growers find that they must study the problem of fertilizing so as to force the crop to early maturity so as to make it safe before the fall broods of weevil, which are the most destructive broods of the season. It is a question of "early cotton or none" where boll-weevil gets hold, and, as we will in all probability have boll-weevil in North Carolina in the course of a few more years, we need to study the means of forcing the cotton crop to early maturity. Fertilizers can help us in this. Aside from the question of forcing a crop to early maturity, it stands to reason that any system of fertilization which enables our crop to grow strongly and healthily will enable it to recover from any slight injury which insects might inflict.

7. EARLY, RAPID CULTIVATION.—Within the last few years we have come to appreciate the value of rapid cultivation of corn and cotton early in the season, so as to give the crops a clean start ahead of weeds and grass, and to work them clean quickly after rains. For this purpose weeders or section harrows are used, going diagonally across the rows of the young corn or cotton. Although it tears out a few stalks (and often *looks* as if it would do more harm than good) yet

we find that it kills out the young grass and weeds so effectively and stirs the ground (lightly) so close up to the young plants that it is a very great benefit to them. *At the same time let us remember that such rapid early cultivation is very annoying to cut-worms, cotton root-louse and other underground insects*, so that by this practice we not only encourage the crop but we *discourage* its insect enemies.

8. ROTATION.—A wisely planned, carefully carried out system of crop rotation is always advisable. It helps the land by resting it from the exhausting effects of a single crop, it results in much larger yields per acre, and it makes the growth so strong and vigorous that slight injury by insects is quickly outgrown and consequently scarcely noticeable. Rotation is discouraging to insects that live underground or to insects which do not move freely from place to place. Furthermore, when a rotation is followed the acreage in each crop is apt to be reduced and the value per acre is increased at the same time, so that we can more easily and with greater profit use more expensive and more effective measures of control. For instance, with cotton boll-worm, if one has 100 acres in cotton only making one-third of a bale per acre, he could not afford to go to very great expense to combat boll-worm. But if he has only thirty-three acres, making a bale per acre, he could well afford to go to the expense of dusting over all the plants with poison or use other expensive measures, for his crop would justify it. Furthermore, if one man makes only one-third bale per acre, and boll-worms were to destroy one-fourth of that, he would have only a very unprofitable crop left. But if by practicing rotation he has worked his land up to a bale per acre, even if the boll-worm destroyed one-fourth of his crop he would still have a profitable crop left.

SUMMARY.—These considerations show us plainly that even though we may not consider it worth our while to give special attention to every pest which may attack our crops, yet it is abundantly worth while to put in practice such methods as will actually make larger crops anyway, and which will at the same time reduce the damage from insects. Injuries from insects usually seem worst on crops that are not doing well. All that we can do to grow *big crops* will make our losses from insects relatively less. The man whose land is held steadily at a standard of a bale or more of cotton per acre, or sixty bushels or more of corn per acre, is not usually the one who complains most of insect damage to cotton and corn.

DISEASES OF PLANTS.*

F. L. STEVENS.

The loss incurred from plant diseases is often underestimated by the farmer; passes unrecognized, or is regarded as natural and inevitable. As a matter of fact plant diseases are exceedingly destructive, and the difference between profit and loss on a given crop is often traceable to the way in which the plant diseases are handled. In general, plant diseases may be described as including all rots, molds, blights, mildews, rusts, smuts and spots of various kinds. Many of these depreciate the value of the yield or cause its loss during storage. Leaf spots, blights, etc., reduce the amount of green matter of the leaf, and thereby reduce the starch-making power of the leaf. The purpose of the leaf is to produce starch, to nourish the wood, twigs and fruit of following months and years. If the green portion of the leaf and its starch-producing power be destroyed future yields must suffer accordingly. The number of diseases of the nature under discussion is very large. There are several hundred serious and injurious plant diseases. Of these many can be prevented by proper treatment, although, of course, there are many others for which no satisfactory treatment is known. The treatment is based upon our knowledge of the nature of these diseases, most of which are caused by parasitic bacteria or fungi. Bacteria and fungi are very small living organisms which grow upon or in the crop plant, draw nourishment

*The illustrations are loaned by Macmillan Co., from Stevens & Hall's book, Disease of Plants

from it, and thereby cause its disease. To prevent the inroads of such enemies man resorts to the use of suitable poisons to spray upon or otherwise to apply to his plants, and thus to kill the invading fungi or bacteria. Wherever fruit or truck crops are raised commercially we now find that spraying forms part of the care of the crop just as much as does tillage, pruning and fertilizing. Spraying is a necessity to the profitable growth of these plants. Many people object to the idea of spraying, saying that their grandfathers could raise abundant good fruit without spraying. This may be true, but we of to-day can not do it. Diseases have increased in number. Many have been imported into this country from foreign countries. Diseases which prevailed in only one or a few States now spread over the whole United States. Diseases which were formerly trifling in injury have increased to be very injurious, so that the crop producer of to-day must face the fact that to raise profitable crops he must take steps to prevent plant diseases. In many instances an outlay of a few cents gives a return of several dollars. Orchards entirely useless are frequently made productive by proper treatment. Every farmer should gain knowledge concerning the chief diseases of his crops, and should equip himself to fit them.

SOME COMMON DISEASES.

Oat Smut.—Oat smut, often called black-heads, is the cause of more loss than is generally recognized by the farmer. Actual count of smutted plants in the field

FIG. 147.—Smut (*Ustilago avenae*) on oats.

frequently shows a loss of from 10 to 40 per cent of total crop. The only way to know just how much one is losing from oat smut is to go into the field and carefully examine it. The smutted plants are often low and escape casual observa-

tion. This smut can be entirely prevented by treating the seed by formalin or 40 per cent formaldehyde, which can be procured from any drug store, costing from between thirty cents and $1 a pint. To treat the seed mix formalin in with water at the rate of one ounce to three gallons. One gallon of this mixture is sufficient to treat one bushel of seed oats. Spread the oats out on a smooth floor or hard, smooth ground. Spray or pour the formalin mixture upon them; shovel back and forth and mix thoroughly; cover over with blankets overnight and the danger from smut is eliminated. The seed may then be dried and drilled.

Wheat Smut.—There are two kinds of smut on wheat, one which remains in the grain and has a foul smell. This is the stinking smut. The other falls out and leaves only the bare stalk standing. This is a loose smut. The stinking smut can be treated with the same treatment recommended for oats. The loose smut is not prevented by this treatment. Loose smut is carried in any seed which comes from a diseased field. No seed from a field bearing loose smut should be used. If such is the only seed available it can be cleaned up by a rather difficult process, directions for which can be secured in a Bulletin which can be had by writing to the Department of Agriculture, Washington, D. C.

RUST.

Apple.—Apple rust is a disease which may be readily recognized by its yellowish spots, often with an orange center, occurring upon the leaves. On the lower side

FIG. 188.—Cedar apple, gall of the rust fungus.

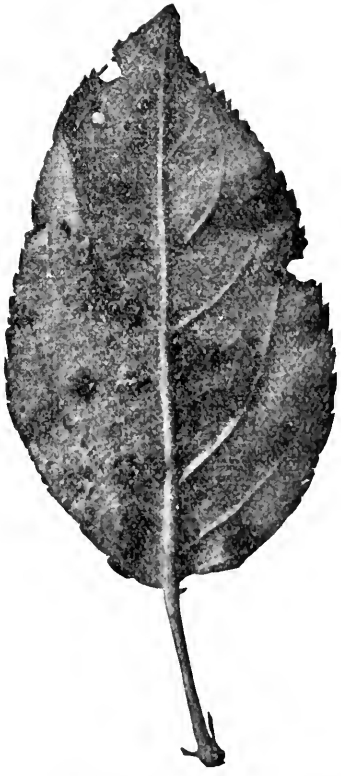


FIG. 28.—Apple leaf affected with rust.

of the leaf spot is a warty outgrowth. This apple rust is particularly prevalent throughout the eastern Piedmont sections of the State and is often very de-

structive, diminishing the amount of green leaf surface, and thereby lessening the vigor of the tree and its productiveness. The apple rust is responsible for a great deal of the loss in sections where it prevails. This disease has a peculiar history, in that the fungus which causes it spends its summer upon the apple, causing the leaf spots, and its winter upon the cedar tree, causing the familiar gall known as cedar apples. These cedar apples in the spring send out abundant gelatinous horn-like projections which bear great quantities of the spores of the causal fungus. These spores, borne by the winds, bear infection to neighboring apple trees. It is thus seen that the apple tree is an enemy of the cedar tree and that the cedar tree is an enemy of the apple tree, and that the two can not be grown successfully near each other. The treatment to be employed against this disease consists in removing, whenever practicable, all cedar trees that stand near apple trees, that is, that are within a quarter of a mile of apple trees.

LEAF SPOT.

Apple.—Apple leaf spot is a more or less circular tan-colorod spot in the leaf It may usually be recognized easily by the fact that it is marked by several more or less regular concentric circles. This leaf spot, unlike the rust, prevails in greatest abundance in the western part of the State. To prevent it the trees

FIG. 33—Apple leaf spot in late stage of development, showing concentric rings.

should be thoroughly sprayed with bordeaux mixture. One treatment should be made just before the buds open, another just after the blossoms fall, and subsequent spraying should be given every ten to fourteen days thereafter.

HYPOCHNOSE.

Apple.—This is a disease which was described by the writer in the thirty-second annual report of the North Carolina Agricultural Experiment Station. It prevails particularly in the mountainous section of the State, and may be

FIG. 34—Hypochnose, showing matting of leaves.

recognized by cinnamon-colored bodies about one-eighth of an inch in diameter found upon the surface of twigs which bear the diseased leaves. This disease can be prevented by spraying as suggested above.

BLIGHT.

Pear.—Pear blight is recognized by sudden dying of the leaves and twigs. It constitutes our worst pear disease. This disease is caused by bacteria which exist in enormous numbers within the combium layer and there multiply, resulting in the death of the part invaded. No satisfactory treatment is known for this disease, and the only treatment which can be recommended is to cut out and burn all twigs which are infected. The twigs should be cut fully a foot below all signs of disease. By so doing many germs will be destroyed and the amount of infection will be lessened. The best time to make the first inspection is during the winter, and subsequent inspections and pruning should be made every week. If the pruning knife should accidently pass into diseased wood it might become ladened with the bacteria and thus infect the other twigs. It is

well, therefore, for the pruner to carry a cloth saturated with a solution of corrosive sublimate and to wipe the pruning knife with this after each cut. If

FIG. 42—Pear blight, healthy and diseased twigs.

these directions are followed carefully the disease can to a very large extent be brought under control.

WILT.

Cotton.—Cotton wilt may be recognized by sudden wilting of the plants, the wilting often beginning between the veins of the leaves. Plants showing wilted leaves if cut crosswise near the ground reveal darkened strands running lengthwise through the stem. The root is also more or less decayed. A further symptom of this disease is that it occurs in spots in the field, and that these spots occupy the same location year after year, and enlarge as time goes by. The disease is caused by a fungus in the soil which gains entrance to the plant through its roots, grows into the water vessels, plugs them and thus cut off the water supply. No treatment is known except to employ resistant plants on soils infected with this disease.

Cowpea.—Cowpea wilt differs from the cotton wilt in that the leaves fall, leaving the stalk bare. In its other symptoms it resembles the cotton wilt, and the remedy consists in planting only resistant varieties. The most serviceable is the iron pea.

Watermelon.—Watermelon wilt is similar to the cotton wilt, whole vines drooping and dying in a day. The darkening of the veins in the stem, the recurrence on soil once infected, are the characteristics by which it may be recognized. Since cowpeas are often raised with melons, infected melon vines readily find their way through the cowpea hay to the manure pile. In the manure pile the fungus increases rapidly, and the manure thus becomes capable of carrying the disease to any land to which it is applied. Stable manure in the infected region is therefore dangerous. Land once infected can not be cured, therefore precaution should be taken to prevent the infection of land which is now healthy.

BLIGHT.

Potato, Irish.—Experiments in many States have proved the value of spraying Irish potatoes with bordeaux mixture. The yield is often doubled or even trebled. Bordeaux mixture should be applied; the first application when the

FIG. 119—Potato late blight.

plants are about eight inches high with subsequent applications every ten to fourteen days. Any one interested in this spraying should write to the Experiment Station, Geneva, N. Y., for their Bulletin on the subject.

BLACK ROT.

Grape.—This disease is the most common of all grape diseases, and is found all over the State. It may be recognized by the black, dried, wrinkled berries. In many sections the crop is absolutely worthless on account of the prevalence of this disease, and it is found to some extent at practically every home where grapes are raised. This disease can be almost entirely controlled by proper, thorough spraying with bordeaux mixture as recommended above for apples. A special BULLETIN concerning this disease can be had on application to the North Carolina Agricultural Experiment Station, West Raleigh, N. C.

Every farmer should familiarize himself with the chief plant diseases and learn how to prevent them. He should learn how to make bordeaux mixture and the lime-sulphur washes, and should use them. He should equip himself with spray pumps suited to his needs. THE TIME TO DO THIS IS NOW. Write

to the North Carolina Agricultural Experiment Station, West Raleigh, N. C., or the North Carolina Department of Agriculture, Raleigh, N. C., for any additional information needed concerning any of these subjects.

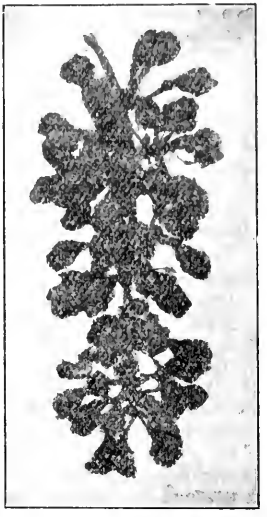


FIG. 70—Grape black rot.

SEED SELECTION.

J. L. BURGESS.

In December, 1909, Dr. C. G. Hopkins, of Illinois, addressed the following letter to the Ministers of Agriculture and several other leading agricultural investigators in a number of European countries:

"SIR:—Statistical records clearly indicate that in your country there has been a large increase in the average yield per acre of wheat and other cereal crops during the last 80 or 100 years—an increase amounting as a rule to about 100 per cent.

"We shall esteem it a very great favor if you will be so kind as to inform me about what relative proportion of this increase you would attribute to each of the following factors:

(1) "To the use of improved seed.

(2) "To the use of plant food in commercial fertilizers and stable and green manures.

(3) "To better rotation of crops.

(4) "To more thorough tillage.

"Without doubt you have sufficient information concerning the changes that have occurred in your agricultural practice during the last century to enable you to designate somewhat closely the relative importance of these several factors in effecting the increase over the former yields, and your opinion in this regard will be highly appreciated by us.

"With deep respect I am,

"Very truly yours, (Signed) CYRIL G. HOPKINS."

It would be both interesting and instructive to review the replies Mr. Hopkins received relative to all four of the factors mentioned above, but for our purpose it must suffice to note briefly the influence of the first factor in doubling the yields of European crops.

The letter was sent to men and societies that would be most likely to have an unbiased opinion, and whose information would entitle their decision to a very close approximation of the facts.

We were no little surprised, therefore, when we found such men as A. D. Hall, of England, Von Seelhorst, of Germany, the Director-General of Agriculture of Holland, the Minister of Agriculture of France, and a number of other leading spirits in European agriculture, placing the amount of increase in yields in those countries, due to improved seed, at from 5 per cent to 15 per cent. Most of the increased yield is due, say they, to better cultural methods, commercial fertilizers and the use of green and stable manures, the latter of which is made largely from feeds imported from the United States and other foreign countries. Mr. Hall, in his reply, says: "Improved seed do not count for very much. We still grow a great many varieties that were known 80 to 100 years ago."

It is clear from the above statement that Mr. Hall recognizes a difference between "*improved*" seed and "*good*" seed. We can have very poor "improved" seed and very good unimproved seed. What we want is good seed, whether improved or unimproved. And what are good seed? Seed are good when they are sound; have maximum germinating power, and have been selected from high-yielding mother plants. Such seed may be "improved" or unimproved, but they will be good, and consequently give a perfect stand and high yield, other things being equal.

In the absence of absolute experimental data we venture the assertion that our corn and cotton crops are reduced at least 10 per cent by a poor stand, caused by using weak and unsound seed. Should this statement stand the light of investigation the farmers of the State are losing yearly several million dollars from failure to get a good stand of corn and cotton, to say nothing of wheat, oats, tobacco, etc. Furthermore, when we examine an average row of cotton and find one-third to one-half of the plants bearing from two to ten bolls and the rest of the stalks loaded down with from twenty to fifty bolls, we again feel the effect of allowing the ginner to select our cotton seed rather than do the selecting ourselves in the field at picking time. Again our failure to select our seed is felt in the cornfield when we come to harvest our crop from barren stalks or well-developed stalks with only nubbins on them. The general law that like begets like, or that "Whatsoever a man soweth that shall he also reap," rules with as great harshness in the corn and cotton fields as anywhere else. We will now discuss some of the details of selecting seed corn and cotton seed.

It must be borne in mind that show corn is not necessarily good seed corn, though the ears may be sound, approach perfection of outline, and take the highest premiums. Corn shows are very valuable stimulants to agricultural communities, but they are very poor places at which to select or buy your seed corn for next year. This is because corn for show purposes generally comes from single-ear stalks in case the exhibit is made of husked ears off the stalks; and where the ears are exhibited on the stalk little or no attention is generally paid to the general development of the plant in the field, etc. The mere beauty of an ear of corn, then, is no criterion by which to judge of its merits as seed corn.

The most approved method of selecting seed corn is to go into the field before the fodder is ripe and pick out the best two, three or four-eared stalks, depending on the degree of prolificacy that is desired in the variety, and tag them. These stalks should be allowed to dry without disturbing the fodder or tops. After the stalk is quite dry gather these seed ears and put them where the rats can not get at them. It is a good plan to select about twice as much seed corn in the field as will be needed for planting in order that a second selection may be made during the winter.

In the selection of cotton seed a similar plan may be followed. The best plants in the field should be used as mother plants, and the picking done from the middle of the stalk, avoiding the bolls at the extreme top and extreme bottom of the plant. Pick several hundred pounds in this way and have the ginner gin it separately and return the seed unmixed. It is poor economy to plant any but

the most vital seed, because from weak, undeveloped seed a poor crop is sure to result, and no amount of fertilization or cultivation is going to overcome this tendency to low yields.

When Mr. Hall, of England, said "Improved seed does not count for very much" he had reference to the recent new varieties that have been thrown on the market, because most of the wheats grown in his country are improved wheats, and it is as true with varieties of wheat as with varieties of corn and cotton, that the careful selection of seed is absolutely necessary, not only to the highest yields per acre, but to the prolongation of the life of the variety.

The use of the breeding plat has been so often urged that it would seem scarcely necessary to refer to it again, but for its very great importance in the breeding of seed corn.

LIVE STOCK FOR NORTH CAROLINA.

A. L. FRENCH.

North Carolina has been for two generations a non-live stock State. Much live stock has been produced and kept on the farms of the State, of course, but except in the extreme western part of the State no great attempt has been made to establish a regular live stock system, and the stock kept has shown the effects of the lack of business methods in breeding and handling, the animals in general showing lack of breeding in inferior type and lack of feeding in improper development. The lands of our State, as a whole, by their condition, when compared with live stock producing sections, show where our farmers have made a mistake in the neglect of this centuries-old method of maintaining soil fertility, and the financial condition of the great mass of our farmers would indicate that there has been something radically wrong in the methods they have employed in the conduct of their business. We all agree that there are altogether too many wasted, scarred hillsides, too many poor country schoolhouses, too many, far too many, unpainted, poor-looking dwellings housing the farmers over our State, and altogether too few fine, attractive church buildings where farmers meet together to worship God. The things I have mentioned are pretty sure indicators of the financial condition of the farming people of a section. We all agree, I believe, that the soils of our State must have something done for them during this generation that has not been done in the past, or they are going from bad to worse. Many thousands of acres will, we believe, be redeemed only by the use of grass sods, and grass sods can only be made use of profitably when live stock is kept. This is the first reason I would assign why we must have more live stock in our State. The writer knows of no hill country in America where hoed crops have been handled exclusively that does not show plainly that poverty of soil is all abroad. The pasture is now and will be for years to come the foundation upon which live stock growing must be builded. There are pastures and pastures so called. Ours are mostly in the latter class, and the first thing our people must learn is that pastures are like other crops, viz., good if grown on good land and given proper methods of culture, proper seeding and proper care. The amount of grass grown per acre and the kinds of grass will be the first measure of the value of the pasture. The second measure of value will be the kind and quality of animals produced. A piece of land that will graze a steer per acre will produce twice the profit and more than will a piece which affords feed enough for a steer on every two acres. The greater productivity is brought about by clearing the land of every plant except such as produce good nutritious stock food. After a field is once carefully grubbed, only a little labor is required to keep it clean if that labor is applied at the proper time. If the piece of land grazing a steer per acre is handled by a scrub steer that will sell at three cents per pound, that piece of land is producing only one-half the wealth that it would produce were the steer of correct beef type, such as are selling at six cents per pound. The same rule applies to the dairy cow, or any other animal. A pound of growth costs no more feed on a $200 horse than it does on a $100 animal, of the same age. So the kind of an animal has worlds to do

with the profit in live stock growing. The world asks for and is willing to pay twice as much for the same number of pounds, of the kind of animal it wants. When a certain amount of pasture will produce just about the same number of pounds of one sort as it will of another cheaper sort, it is just good business sense to feed the pasture to the better animal. This is plain, isn't it?

We are all agreed that North Carolina soils must be improved, so we can make more pounds of product with the same or less amount of labor than is being used to-day. The many leguminous plants that the soils of our State will produce will—because of their nitrogen gathering habit and humus producing capacity—become our greatest soil improvers. These plants can not be produced and used the most profitably without live stock, as with live stock we may secure both the manurial and stock food values, the latter amounting to around nine dollars per ton for each ton of dry hay produced. This hay may, by the use of the best harvesting tools, be housed at about $1.00 per ton in North Carolina (we have harvested many hundreds of tons at that figure or less), and if the manure be carefully handled fully 75 per cent of the plant food value may be retained to enrich the soil, after the animals have secured the food value. And the high-class, high-priced animal pays the double profit here the same as in the use of the pasture, no more pea hay being required to produce a pound of six-cent beef than is required to produce a like amount of three-cent. Another point in favor of harvesting the legumes instead of plowing them under for manure direct is, that when land is of uneven fertility when the plants are returned to the soil direct a large amount of the product is returned to the rich spots which are already productive, while the poor spots that produce little receive little in return, while if the whole product of the field is made into manure the fertilizer can be applied upon the parts of the field where most needed, in such quantities as may be thought most profitable. A troublesome labor problem is becoming more acute in our State, and the farmer is not without his share of this. The keeping of live stock in many ways tends to mitigate this trouble. The third or half of the live stock farm acreage devoted to pasture requires practically no expense for labor in harvesting the crop. Other large areas of the farm devoted to hays for winter feed for stock may be harvested by machinery rapidly at small expense. In certain sections of the State varieties of hays may be grown that occupy the land for several years in succession, thus eliminating the expense of planting the land each year. This reduces the labor bill again. By having these stock food crops come in succession, the labor of harvesting may be distributed over several weeks, thus keeping a less number of hands more regularly employed. And by having the live stock to feed and care for, profitable work is provided for the winter months, establishing on the farm the same twelve-months working season that is found necessary to make other businesses the most profitable. By careful business methods and good judgment, a larger amount of wealth may be produced per hand on the North Carolina farm handling live stock than can be produced on farms of the West. We are told that a hand in Iowa averages around $900 per year. The average in North Carolina is under $400. The writer knows of farms in our State that are averaging more than $1,000 per hand per year where live stock is the principal business. We admit that it requires a higher degree of intelligence to make live stock growing successful than is required to grow seed crops, but we have all got to come to putting more brains into our business, any way, so this is really no argument against the growing and feeding of good live stock. It means great things to our State, so is it not time we were about it?

LIVE STOCK.

JOHN W. ROBINSON.

In riding over our section of the country you generally see land that has been cleared, all timber cut and put on the market, and in its place pine bushes and galled places ribbed with gullies. Our streams are filled with soil from the hill sides, thus making our bottom land almost worthless.

If live stock had been put on these hills long ago they would not only have been making our butter, beef, mutton, pork, etc., but we would have improved our land so it would be producing corn, from 50 to 100 bushels per acre, and hay for our stock instead of our having to buy most of it from the West. Now the average corn yield in North Carolina is only 16.8 bushels per acre, cotton about one-half bale per acre, wheat not over 10 bushels. I have seen 60 bushels of oats grown on one acre, 2 bales of cotton, and 226½ bushels of corn per acre. Inquiring into this, we find these yields to be made by a generous supply of manure.

If these yields can be made in North Carolina, why not use our hills for live stock and use the manure for the level fields for intensified farming? There is no farm the size of 50 to 100 acres that has not some rough land, that should be pasturing live stock, and we generally find on these farms not more than five or ten head of live stock, including the work stock, but not including the *dogs*, of which there are too many.

There must be some kind of live stock grown on these farms. I'm not saying what kind—either horses, cows, hogs, sheep, and the breed you like best is the best breed for you. Of course, I am a dairyman and partial to the dairy cow. All in one community should breed one kind. If a dairy section, breed the best dairy type. Holstein for milk, Guernsey, Ayrshire or Jersey for butter. If you live in a beef raising section, then all breed one kind of beef cattle. The Short Horn, Hereford, Aberdeen Angus are all fine beef breeds. All should, I think, breed the same for the reason that when we have selected a pure bred sire to breed on our cows and he has proven to be worth thousands of dollars he should not be killed at beef price, and to keep from in-breeding we can exchange bulls with our neighbors and keep right on without expense. Another reason is, when our surplus is for sale a man can come and buy a carload of cattle in one neighborhood, all the same size and color, and this will bring a higher price than if they were of different breeds and colors. Do you know the Aberdeen Angus steers, sold last year on Chicago market at one year old, weighing about 1,000 pounds each, for $8.00 a hundredweight? Now what is a scrub steer bringing on the market? Not over $10.00. It doesn't take any more time to grow an $80.00 steer than a $10.00 one; takes more feed, but he always gives value returned and much more. In my opinion, there is no general-purpose cow. I am convinced of this more and more every day. If growing beef cattle and you want milk and butter for your family, buy a dairy cow. Neither will a dairy cow make good beef. I have never seen a man that could do everything; neither can we expect our lower animals to do all.

I wouldn't advise jumping into buying a lot of pure-bred cattle, but buy a pure-bred sire, because you haven't had experience in raising them and the average man hasn't the money. A good male can be bought for about $100.00. If you can't get one for that, pay more. I'd rather have a fourth or eighth interest in a good bull from good ancestors than to own a cheap bull all by myself. In buying a beef bull, select him from good ancestors and breed him on grades. He should show up his type in the choice cuts of beef if he is any good. If you have this, stick to him, don't get scared of him and kill him.

In buying a dairy bull it is a little different, and the risk is great. You want to buy him from a sire whose mother made a good record and from a good record dam, also granddam and great granddam and the whole *dam* family.

When the calves come you can't tell at first whether you have a good bull or not, but must wait until these calves are fresh, and then after a year's record work you will discover whether you have a good bull. He will be five or six years old by this time, so if you made a mistake in selecting him you are six years behind in breeding cattle, and must start all over again. A man would hardly buy more than six or eight bulls in his lifetime. You may think I am extravagant in buying a good male, but let us figure a little. Suppose you are breeding a herd of twenty to a scrub bull. Say one-half the calves will be heifers and one-half bulls. The bulls will be sold for veal at about $1.00 each, all ten being worth only $10.00. The heifers, very likely, if kept, will not pay you for their feed. Pardon me for referring to myself. I have a bull out of a 700-pound cow. Several years ago I began testing my cows and keeping record, so sold out all the

cows that did not pay for their feed. One calf was kept from a cow that did not pay for her feed, but out of this bull. With her first calf she made 327 pounds of butter for the year, or a profit of $66.00. Now you would have by using this good bull ten heifers making a profit each of $50.00 at least per year. You would then have $500.00 the first year these heifers were fresh to pay on your good bull. With this start we will be able to build up a good business and also to improve our farms.

I remember one old gully on my farm I used to slide down when a boy, causing much trouble later. I never dreamed then of this ever being filled up, or I would at least have objected, but to-day, with the help of some manure, that gully is bringing a fine crop of pea hay instead of a fine spanking crop. The hills are in pasture, brush put in gullies, galled places healed, bushes cut along roadsides, and good wire fences, for remember we can't raise stock without good fences. Bad fences make bad stock, and bad stock makes bad neighbors. There's nothing worse. I'll not say that any one's wife makes bad butter, as I suppose you all think, or should think, your wife makes the best butter you ever ate; but I want to ask the question, where does all the bad butter come from? You have all seen such butter often in barrels in the back part of stores, and you are ready to say, "It's shipped off for axle grease." But it isn't. It is sent North, run through a renovating plant, and shipped back South, where it retails for 40 cents per pound, perhaps from the same store where it was bought for 15 cents six months before. It must go through the merchant, the express company, renovating company, express company again, and back to the merchant and on to the consumer, each getting their share of the profit. Another thing: millions of pounds of butter are shipped here from Western creameries, good butter, too, and I haven't a word of criticism; but let the West look after the Western States and North Carolina after her own markets. We can't afford not to.

Then we see on the average farm all kinds, shapes and colors of chickens, as varied as the rainbow. They do not lay any better when the breeds are mixed. If for nothing more, it will help the looks of the farm to have all one kind. But not only that, in putting them on the market they will bring from two to three cents more per pound, and the eggs, if assorted and neatly packed, will bring from five to seven cents more per dozen. Then, if twenty neighbors were each breeding a different variety, how easy it would be to fill any order!

To accomplish the best breeding of live stock we must have some kind of organization, for to-day is the day of co-operation. We can meet at the different farm homes, discuss the problems of farming, the failures and successes, and have a little institute occasionally of our own. We can build telephone lines, buy our feed and machinery together, sell and buy live stock by the wholesale.

Three years ago we had only two separators in our county. To-day there must be fifty. Our association has established a successful co-operative creamery and fresh-egg business. We have been able to run the only strictly agricultural fair in the State; no midway, gambling dens, fortune tellers, etc., are allowed. We have also induced our county commissioners to go to work on better roads by taxation. Many things can be accomplished by co-operation.

TYPES, BREEDS AND BREEDING OF FARM ANIMALS.

DR. G. A. ROBERTS.

By way of introduction, permit me to say that, in having observed farming and live stock raising in the North, South, East and West, it appears to me that most of us could materially profit by breeding and raising more animals. Profitable in two ways: First, directly, from the use or sale of such animals; and second, by maintaining and increasing the productivity of our soils. The increase in number of animals upon our farms should be made gradually, that we may accommodate ourselves and conditions to care for more. Such an increase would

likely be made if we did more breeding and less buying of animals. Other people are making money in raising animals to sell to us, and why not produce more of them ourselves?

BREED TO MAKE THE MOST OF IT.

If we appreciate these advantages to the extent of undertaking to bring them about, we should attempt to make the most of it. Since the characters of growing animals are largely determined by inheritance, feed and care, it behooves us to give some thought to the selection and breeding of animals possessing desirable types and qualities.

"GRADING UP" THE SCRUBS.

For most of us the profit will not be in the raising of pure-bred live stock nor in the raising of scrubs, but will lie in the grading up of our animals. This consists in the using of pure-bred sires upon native scrub females. The offspring of such mating would be one-half blood of the breed of the sire. The next mating would then be between the female offspring of the first mating and that of a sire of the same breed as used before. This would yield offspring of three-quarters blood. Continuing this process till the fifth generation, the offspring would contain thirty-one thirty-seconds of pure blood. Animals so bred for several generations are called high grades, and while they are usually just as good individuals as if pure bred, the males should not be used for breeding purposes.

USE PURE-BRED SIRES.

The reason for not using a grade, even a high grade, sire lies in the fact that the longer a strain of animals has been bred for definite characteristics the more certainty of animals of that strain transmitting, by laws of inheritance, those characteristics. On the other hand, the shorter the time of fixing those characteristics, as in grades, the less likelihood of transmitting them.

SELECTION OF SIRE.

The sire should be selected largely with the view of fulfilling two requirements. First, he should be a good individual himself, a representative of the type desired. Second, he should come from a long line of meritorious ancestors—a pure bred. If the females on hand are somewhat undersize and it is desired to increase the size, as it should be in most cases, better results will usually be obtained by increasing gradually, therefore the extremes in size of male and female should not be too great, yet the usual fault to find is in the use of too small a sire.

THE KIND OF ANIMAL, THE TYPE AND THE BREED TO RAISE.

There are several factors to be considered in determining what kind of animals—horses, cattle, sheep or swine—to raise, what type to select and what breed to choose. Unless breeding animals for our own use, necessarily one of the important factors will be that of market demand. A second factor concerns the conditions on the farm at the present, or possible changes, with reference to suitable buildings, the character of crops, the convenience to market, help, etc. Again, a third factor may be the fancy of the farmer in being partial to some breeds more than to others, and he is likely to make greater success in the raising of those he favors.

HORSES AND MULES.

With the prevailing high prices for horses and mules there are few mares that should not be bred to a good horse or jack, selected as indicated above. While on most farms there is still a place for some of the smaller-sized work animals, we should consider well the advisability of increasing the size by the use of the special breeds of draft type. Mules are not included in our appended classification of animals, and yet because of their utility in Southern farming they should receive a just share of consideration. More of our larger mares should be bred to good-sized jacks to produce some of the extremely high-priced mules that are at a premium at present.

CATTLE.

The prices of cattle and their products should cause us to investigate the possibilities of our being able to produce such at a profit. With this class of animal is largely sought the indirect profit in furnishing a home market for a large share of the crops and then leaving something like three-fourths of the crop's fertilizer value on the farm.

Dairying is especially attractive from the financial standpoint, but has the disadvantage of being perhaps the most confining line of live stock farming of all. With this industry, even if we are using the grading-up process, it will pay us well to carefully select the females as well as the sire. Many a so-called dairy cow is costing more for her keep than she is paying.

Perhaps the most difficult line of livestock raising from a financial standpoint is that of raising beef animals, and yet men in the South have made money in such an undertaking by giving it thought and attention. Like most lines of business, it requires intelligent management to succeed. The conditions in some sections and on some farms are very much more suitable for beef production than on others, such as natural pastures or easily obtained ones on lands of little value for other purposes.

SHEEP.

More sheep should be raised in the South because of the character of a large part of the feed they consume often being of little value otherwise, and because of the economical use they make of their feed. In this last respect, it requires on an average only about three-fourths as much food to produce a pound of gain as it does with cattle. The pound of mutton is usually as high, or higher, in price than that of beef. The greatest hindrance to sheep raising in the South is that of internal parasites, which can be controlled to a large extent by frequent changing of pastures. If flock becomes badly infested, then it will be necessary to raise a new flock free from infection by isolating lambs from mothers except when nursing, in barren dry lot, and keeping on pastures having had no sheep on them for several years previous.

HOGS.

Hogs are likewise very economical feeders, even more so than sheep, on an average requiring one-half as much feed to produce a pound of gain as in cattle. As a money maker the hog perhaps heads the list for the average person with a comparatively small outlay.

Hog cholera used to be a serious menace to hog raising, but with the use of hog cholera serum its ravages may be reduced to a minimum.

NEIGHBORHOOD LIVE STOCK CLUBS.

Perhaps the most serious obstacle to the grading up of live stock is in the securing of enough females to engage a reasonable amount of service of a pure-bred sire when there are so many cheap scrub sires about. This is a factor of no little importance, for many an individual has attempted to do a favor to his neighborhood by bringing in a good pure-bred sire, expecting his neighbors to patronize him. However, in having to charge a somewhat greater service fee than his scrub competitor, he failed to do the good in not securing the patronage. This difficulty is largely to be overcome by co-operation through the organization of neighborhood "live stock clubs." These clubs, in addition to county and State associations, can do a great deal for the live stock interests. The Farmers' Union should be an instrumental agent in assisting in the formation of such clubs. The club should be made up of a sufficient number of members to represent the ownership of the greater part of the required number of females for at least one sire. Shares of stock should be taken by the members either in proportion to the number of females each owns, or according to the wishes of each with others agreeing, charging a stipulated service fee and receiving in return dividends in proportion to stock held. We should mention, perhaps, that company affairs do not always work smoothly, largely because of some misunderstanding or wilful

neglect on the part of some. This can be avoided to a large extent by having all agreements down in black and white before the trouble arises.

Classifications of live stock are more or less arbitrary, but we submit the following as indicating the more common types and breeds among the various classes:

HORSES.

Types.	Breeds.
Draft	Percheron.
	Clydesdale.
	Shire.
	Belgian.
	Suffolk Punch.
Saddle	American Saddle Horse.
	Thoroughbred.

HORSES.

Types.	Breeds.
Coach (General Purpose)	French Coach.
	German Coach.
	Hackney.
Roadster (Standard-bred)	Trotter.
	Pacer.

CATTLE.

Types.	Breeds.
Beef	Shorthorn.
	Polled Durham.
	Hereford.
	Angus.
	Galloway.
Dual Purpose	Red Polled.
	Devon.
	Brown Swiss.
	Shorthorn (dairy strain).

CATTLE.

Types.	Breeds.
Dairy	Jersey.
	Guernsey.
	Holstein.
	Ayrshire.

SHEEP.

Types.	Breeds.	
Fine Wool	Merinos	American.
		Delaine.
	Rambouillet (French).	
Long Wool (Mutton)	Lincoln.	
	Cotswold.	
	Leicester.	

SHEEP.

Types.	Breeds.
Medium Wool (Mutton)	Southdown.
	Shropshire.
	Oxford Down.
	Hampshire Down.
	Dorset-Horn.

HOGS.

Types.	Breeds.
Lard	Berkshire.
	Poland-China.
	Duroc-Jersey.
	Chester White.
	Essex.

HOGS.

Types.	Breeds.
Bacon	Large Yorkshire.
	Tamworth.
	Hampshire or Thin Rind.

neglect on the part of some. This can be avoided to a large extent by having all agreements down in black and white before the trouble arises.

Classifications of live stock are more or less arbitrary, but we submit the following as indicating the more common types and breeds among the various classes:

HORSES

Types	Breeds
Draft	Percheron.
	Clydesdale.
	Shire.
Coach	Belgian.

HORSES

Types	Breeds
General Purpose	French Coach.
	German Coach.
	Hackney.
Roadster	Standard-bred.
	Trotter and Pacer.

CATTLE.

Types.	Breeds
Beef	Shorthorn
	Hereford.
	Angus.
	Galloway.
Dual Purpose	Red Poll.
	Devon.
	Shorthorn (dairy strain).

CATTLE.

Types.	Breeds.
Dairy	Jersey.
	Guernsey.
	Holstein.
	Ayrshire.

SHEEP.

Types.	Breeds.
Fine Wool Merinos	American Delaine.
	French.
	Rambouillet.
Long Wool	Lincoln.
	Cotswold.
General Purpose	Leicester.

SHEEP.

Types.	Breeds.
Medium Wool	Oxford Down.
Mutton	Hampshire Down.
	Shropshire.
	Southdown.
	Dorset-Horn.

HOGS

Types	Breeds.
Lard	Berkshire.
	Poland-China.
	Duroc-Jersey.
	Chester White.
	Essex.

HOGS.

Types.	Breeds.
Bacon	Large Yorkshire.
	Tamworth.
	Hampshire or Thin Rind.

COMMON DISEASES OF LIVE STOCK.

W. G. CHRISMAN.

The diseases of live stock, like those of the human being, are divided into two classes—contagious and communicable or catching diseases and those which are not transferable or communicable, or catching, from one animal to another. It is to the first division that I desire to direct your attention.

The horse, being the animal in general use on our plantations, therefore gives rise to most concern. One of the contagious diseases to which horses and mules alike are subjected is strangles or distemper. This disease, whilst very common in almost all localities, yet in some sections is much more severe than in others, and in some years much more severe than in others, and, like all other diseases, in some patients much more severe than in others. This disease is so common and so well known by all farmers and those that handle horses, that they apparently pay but little attention to it; however, it is very much more serious than is usually considered.

There are some precautions which, if taken by the farmer will, to a great extent, reduce the spread of this disease. For instance, when we have a horse that we know is affected with strangles or distemper, we should be very careful to leave him in his own stall, carry to him the water that he drinks, the feed he consumes, using the utmost care never to use about the well animals the food boxes, water buckets, bridle, or any utensils that have been about the sick horse. By doing this we would greatly reduce the spread of the disease. If we have to use a horse when the disease is present, on our plantation, it is certainly wise that we use a well one, rather than a sick one. This is wise from two standpoints: first, because the well horse will not carry the contamination to the neighboring horses; and again is in much better condition to do the work and does it very much more satisfactorily both to himself and owner, than the sick one.

The symptoms of this disease are so well known to almost all farmers and horse men that they consider it of little value and give it comparatively little attention. However, these symptoms are clear and well defined. The first we notice is the staring coat or the hairs turned back toward the animal's head. There is present a cough, sometimes slight, other times severe; usually a discharge from the nostrils, which is at first of a rather watery consistency and later a yellowish hue and very tenacious and often accompanied by a disagreeable odor. There is also a redness of the white of the eye, sometimes a discharge like tears from the animal's eyes, and a swelling under the throat; quickened breathing; a tucked appearance of the flank; the horse standing with his head down. He usually turns toward the window or door in order to breathe the fresh air; scant appetite and inability to swallow comfortably either food or water. Oftentimes a stiffness or swelling of the legs, staggering gait, evincing great weakness. These are all symptoms that are quite clear and can be easily recognized.

The treatment for this disease is comparatively simple. Use a purgative of one quart of raw linseed oil, two ounces of spirits of turpentine, giving this as a drench; and use utmost care that the horse's head is not held too high and the medicine administered too rapidly, for in case this reaches the lungs instead of the stomach we may add more trouble than we have reduced. Give them a plenty of pure, fresh water, in nice clean buckets; bran mash, hot, or a little boiled oats; or, if in the springtime and the pastures are green, there is nothing better nor more tempting than grass.

Place the horse in a good comfortable box stall with plenty of good sunshine, without draft, and if the weather is cool, blanket him in order that he may be comfortable. If his legs are cold—which is likely to be the case—bathe them in hot water and rub them dry, and bandage them in order to stimulate the circulation. Toward the middle of the day give him a short walk in the sunshine or turn him in a small lot for exercise. If you find medicinal treatment is neces-

sary, one tablespoonful of nitrate of potash three times a day in the feed or drinking water, or potassium sulphate in the same quantities, or aromatic spirits of ammonia, two ounces, in a pint of sweet milk three times a day. If the horse is very weak and needs nourishment one half dozen eggs given in the milk is very beneficial.

This is one of the many diseases in which good nursing is perhaps as conducive to the recovery of the animal as the administration of drugs.

After the recovery of the patient a thorough disinfection of the stall, feed boxes, waterbuckets, blankets, bridles, currying utensils and such articles is very necessary to prevent the spread of the disease. This is easily and economically done by one application of lime or whitewash.

INFLUENZA OR SHIPPING FEVER.

This disease, like strangles, is highly contagious; found to a great extent among horses that have been shipped long distances over the railroads, where they are exposed to infected cars, great exposure to cold drafts, small amount of feed and water and poor attention, being corraled at the stock yards with horses of all kinds and descriptions and from many different localities. This disease is often termed the pink eye, and with this name you are, perhaps, more familiar.

The symptoms of this disease—as you will usually find them—is, first, a very reddened condition of the eye, hence its name, swelling about the nostrils, lips and throat. The legs are usually badly swollen and cold, and also the ears are cold. From the eyes we often find a heavy discharge of tears and oftentimes a heavy yellow pus. In many instances the eyes will be swollen shut. The throat is very sore, thus making it difficult to swallow both feed and water. The hair stands on end, and the horse has a dejected appearance. The head hangs low, and he moves around the stall very slowly and cautiously, oftentimes staggering and falling, and making several attempts to rise before succeeding.

The treatment for this disease is very similar to strangles. Place the horse in a warm, comfortable box stall, which has been well cleaned and well bedded, giving plenty of fresh air and sunshine, fresh water and nourishing food. Practically the same drugs as in the case of strangles, with the addition of nux vomica and strychnine as a stimulant, and creoline, internally, as an antiseptic. The same precautions should be taken to prevent the spread of the disease as are advised in strangles.

GLANDERS.

This disease, while not nearly so common as the others, yet causes greater alarm, and is very much dreaded on account of its being one of those diseases for which there is no cure. When an animal once contracts this disease the only method of handling it is to destroy the animal. Apply the mallein test to all exposed animals, taking all sanitary precautions to prevent the spread of the disease. One extremely important condition of this disease is that it is communicable to man; and man, like the horse, finds no relief from the agony and suffering except by death, as no treatment has been found. Therefore it is quite easy for us to see and understand why glanders should be so feared and dreaded.

The symptoms of glanders are discharge from the nostrils which, at first, is of a watery consistency, but very gluey and tenacious, afterwards becoming a deep yellowish hue and sticks to the nostrils almost as glue, and often to the bucket or whatever substance it comes in contact with. There may be a swelling, and usually is, under the jaw, but, unlike influenza or distemper, it is of a hard, bone-like condition, as though it were attached to the bone, while in strangles or influenza this swelling is soft and simply in the muscular tissue.

There also appears swellings or abscesses over the body, most especially on the under portion of the abdomen and the inside of the legs. From these abscesses there may be a discharge of pus, which has an offensive odor. The disease may be transmitted from one horse to another, or even to man, by this discharge from the nostrils or from the abscesses getting in the mouth, nose or sores on the body, through which the disease may be developed.

The laws of our State makes this a disagreeable disease to handle because they require that every horse affected thereby must be destroyed, or, in other words, the penalty of $50 is imposed upon a man for keeping in his possession a horse affected with glanders.

The symptoms of this disease are not very clear and, therefore, make it more or less difficult for the farmer or horseman to diagnose. In order to be sure of the existence of this disease it is wise to have the mallein test applied, in order to make certain and sure.

It is only in the last year that the Department of Agriculture has traced out the existence of glanders in this State to direct importation of horses from distant cities. In order to prevent this and other contagious diseases being brought into our State a law, or regulation, has been adopted, prohibiting the importation of live stock of any character into this State unless accompanied by a health certificate issued by a reputable veterinarian, and endorsed by the State Veterinarian of the State in which such shipments originate. This regulation was passed by the Board of Agriculture at its December meeting in 1909, and is now in effect. Copies of this law may be secured at the Department at any time.

HOME CANNING OF FRUITS AND VEGETABLES.

S. B. SHAW.

On account of the present high prices of food-stuffs the question of the home production and canning of fruits and vegetables is one of vital importance to farmers throughout the entire country. An abundant supply of fresh garden and orchard products can be had in season, but usually the winter supply of these foods has to be purchased in the form of canned goods.

Fruits and vegetables can be "put up" in glass jars at home as readily as they can be packed in tins at the factories. The great secret of success is complete sterilization. Minute forms of life that we call bacteria are present everywhere in untold numbers. These bacteria are practically the sole cause of the spoiling or decomposing of the different fruits and vegetables. The reproduction of bacteria, which is very rapid, is brought about by one of two processes. The bacterium either divides itself into two parts, making two bacteria where one existed before, or else reproduces itself by means of spores. Spores may be compared with seeds of an ordinary plant. These spores present the chief difficulty in canning the products of the orchard and garden. By complete sterilization we mean the killing of all forms of bacteria. This can readily be accomplished by boiling. While the parent bacteria can be killed at the temperature of boiling water, the seeds or spores retain their vitality for a long time even at that temperature. Upon cooling these spores will germinate, and the newly-formed bacteria will begin their destructive work. For this reason it is necessary, in order to completely sterilize fruits and vegetables, to heat them to the boiling point of water and maintain that temperature for from thirty minutes to an hour and a half upon two or three consecutive days, or else keep at this temperature for a long period of time—five to eight hours. The surest and most economical way is to boil for so many minutes each day for three days, as required for the different fruits and vegetables.

The fruits and vegetables to be canned are prepared in exactly the same way as they would be previous to cooking for immediate use, and are packed firmly in clean glass jars. Pack the jars to within half an inch of the top and fill entirely full with fresh water. New rubbers are then put in place and the top put on, but not sealed tight. The jars are then placed upon small strips of wood, or other supports, in some convenient flat-bottomed vessel that will be deep enough to permit being covered when the jars are in place. This vessel is then filled with cold water to a depth that will bring the water up an inch and a half or two inches on the outside of the jars. The vessel is then placed on the stove and the water brought to the boiling point. With most vegetables boiling

is continued for fifteen minutes, and at the end of this time the jars are sealed tight and allowed to remain in the boiling water from forty-five to sixty-five minutes, as required by the different vegetables. Fruits are prepared and canned in the same way, except the time required for their cooking is about one-half that necessary for vegetables. After the jars have been in the boiling water the required time they are removed to some convenient place where they will be protected from drafts of air, and allowed to stand twenty-four hours. At the end of this twenty-four hours the jars are again placed in the vessel in which they were previously cooked, and are again boiled for the same length of time as on the first day. Again remove the jars, and after standing another twenty four hours proceed to cook exactly as on the second day. After this third boiling the jars may be set aside and kept until wanted for use on the table. The one point to remember is, *when the jar has once been sealed tight after the first fifteen minutes' boiling, do not again loosen or open the top until the contents are to be used.*

TOBACCO IMPROVED BY MEANS OF SEED SELECTION.

FRANK BLACKFORD.

The importance of better varieties and better individuals of these varieties is recognized by growers of all farm crops. Much has been said of late regarding the improvement of corn, and certain well-recognized laws and principles are laid down by means of which this can be accomplished. Among the ways of securing better yields none has been more productive of results than the care and attention given to the selection of the seed. The aim in seed corn selection has been almost exclusively along the lines of increased yields. Just as important is the selection of the seed of tobacco; even more important, since the improvement is not only along the lines of increased yield, but it also seeks to improve the body and the texture of the leaf, the aroma or flavor, or bouquet of the finished products. The principle upon which those labor who would improve the tobacco crop by seed selection is the common law of inheritance, that "like produces like," with slight modifications due to environment. He who would improve his tobacco along the lines of texture of leaf, disease-resistant qualities and in flavor, must know individual stocks which possess some of these qualities, and his selections must be numerous enough of those possessing known qualities that perchance he may find among them those possessing the additional quality or qualities which will make them a desirable type from which to select the seed. It is within the power of any tobacco grower to greatly increase his yield by the careful selection of parent stocks. It is also a simple matter to improve the texture by the selection of seed stalks, though it may require several years before a very noticeable improvement can be made. It is also a simple thing to improve the hardiness of the plants by using only such stalks for seed as are thrifty, resistant to attacks of disease, and which have large assimilative qualities. This necessitates great care and painstaking observation. It implies a knowledge of tobacco disorders. It also assumes that, having noted a peculiar plant in the field, and noting its behavior in the curing house and the general quality when cured, that one would recognize a similar plant again, and would thus know that when subjected to similar conditions similar results would follow.

It is assumed in this article that the grower has an ideal stalk or type of tobacco in his mind. That he has a very definite goal toward which he would go; for it would be utterly impossible within the scope of this article to attempt a treatment of this phase, since types vary in different sections, determined quite largely by the uses to which the tobacco is to be put.

Having in mind an ideal type, the first concern of the grower is to go through his field and tag those which come nearest to fulfilling the conditions of that ideal. The flower of the tobacco plant is a perfect one, and hence the seed can be produced under a bag. This is essential, since cross pollenation is not desirable, as in

cross pollenation it is impossible to know what to expect in the offspring, but when seeds are produced under a bag it is safe to assume that plants from seed thus produced will be like the plant upon which they grow. There is great danger of disappointment in this, however. The desirable quality which we have noticed may have been due to inherent qualities within itself, in which case it will have the ability to transmit these qualities. Or, what we have noticed as desirable may be due almost exclusively to environment, in which event the plant will not neeessarily be prepotent in transmitting the qualities we recognized in it as being worthy of transmission. Weather conditions may tend to overdevelop a stalk and that stalk be a disappointment as a seed stalk, or a great deal of available fertility may stimulate a growth which will cause us to select it as a parent stalk and it may have no value owing to lack of prepotency to improve the subsequent crops.

Nor is this the whole of the problem. In selection of seed corn it is essential that we have as near a perfect germination as possible. We can discard by one method or another the ears that look as though they would be faulty in this respect, and we must actually test those ears in which the eye has failed to find evidence of faulty germination. Again the analogy holds. We must eliminate the tobacco seeds of poor germination, and test those which perchance we have concluded were all right, that we may have the strongest and the best from which to produce our seedlings. Having selected the desirable stalk, it has been found that in every pod there are a large percentage of seed which will not germinate at all, and that there is again a large percentage which will germinate but weakly, and that rarely do we find a larger amount than 40 per cent which would be really desirable to use as seed. It has been found by the various experiment stations that the vitality of the seed is indicated by the relative weights of the seed. The very light ones in every pod will not germinate, the medium may but will not produce strong and healthy seedlings, and that only the heavy ones will produce a seedling of sufficient vigor to give us a good start toward a crop. Hence, the necessity appears for the separation of the heavy from the light and chaffy seeds. The reason for this is readily seen, and its importance should commend the practice of seed separation to every grower in the State. Tobacco seed is among the smallest if not the very smallest with which the farmer must deal. At best it can obtain but little food for the germ within itself, and in the case of the very light there is not enough to support the germ until it can feed upon the plant food in the earth into which it is cast, and it dies unavoidably. In the medium there may be enough to sustain the germ, but not enough to make a strong germ development, and hence a stunted plant, a disappointment during the whole season. Only the very heaviest will have enough plant food against the time when the germ will be sufficiently developed to draw its food from its environment. There are various methods by which this can be done. The method by which it is done is immaterial, if the results are secured. I shall outline a few methods. In the Bible we read of the winnowing process. This ought to give us an idea of a simple and I believe practical method. On a very still day, when there is no perceptible movement of the atmosphere, when it would appear as though there were a dead calm, take your seed, a table oil cloth or a very large paper, spread it on the ground, and then pour the seed out slowly upon the paper or oil cloth. There will be enough air stirring to blow the light and chaffy seed so that it will not fall upon the cloth or paper, only the choice heavy seeds will fall upon the cloth below. If once winnowing doesn't seem sufficient, it can be treated to a second winnowing. In this there must be an almost perfect calm, otherwise the whole of the seed will be scattered to the winds.

Another method, where atmospheric conditions can not be found, is to produce them. An open grate with a roaring fire—with only one opening—will produce a draft toward the fire. One can stand in the door and drop the seed slowly onto a paper or oil cloth. This draft artificially made will do the same thing as the wind. The desirable seed will fall directly upon the receptable, the undesirable ones being drawn toward the grate.

Another method is by casting the seed into a pan of water; the heavy ones will sink and the light ones float; the light ones can then be skimmed off. This has many advocates, not as a perfect method of seed separation, but as one which will be found very beneficial. It is one method suggested by the Department at Washington. I have tried it and I find but little to recommend it. In fact, it is

the method of last resort. The best method, however, is by means of a blower. The Government Department at Washington has devised an apparatus which seems to me to be almost ideally adapted for the purposes herein mentioned. It consists of a glass tube about one inch in diameter, inside measurement. This is set upon a stand with a receptacle for the glass tube. On one end of the glass tube is a very fine screen to prevent the seed from falling through. Into this end by means of a foot bellows is introduced a current of air. The seed is then poured into the glass tube and the air is turned on. The light chaffy seed is blown out of the top of the tube and the heavy seed remain in the tube. This is an almost perfect separation, and while the machine costs something, it will last a whole community for years, and hence we think it will justify any locality to buy one of these separators. In almost every tobacco district there is reported a gradual deterioration both in yield and texture from year to year. In some cases this deterioration is fancied, not real, but in a large number of instances there is a decided deterioration, and this is due almost entirely to a lack of systematic and careful seed selection, and when it is constantly shown that such deterioration is a source of great loss to producers, greater care should be taken in the selection of individual seed stalks. I have seen the seed stalks selected one after another in a row, 4 to 10, and these up close to the shed to be handy. This will never do. The chances are extremely remote that you will ever find two stalks together representative of the best types. They are likely to be found one here, one there, and hence they must be selected wherever they may be found. A farmer should by all means select his own seed, not depending upon a seedsman or the other fellow for it. It is a wise thing to secure a little foreign seed every year, try it out, acclimatize it, and if perchance you receive anything promising, further improve by selection. By this method there may be a marked improvement in the type, both along lines of increased yield and quality.

There is an idea that it is a wise practice to save enough seed one year for several subsequent years, the notion prevailing that there is no deterioration in germination due to the aging of the seed. Such a notion became prevalent among a class of farmers, and indeed among such class of farmers it has several things to recommend it—those who do not pay any attention to the behaviour of plants in the field, who do not consider anything but size or yield, unmindful of disease resisting qualities or quality or texture when they make their seed stalk selections; but among those who are cognizant of the many problems entering into seed selection it is never advisable to select seed for more than one year. Save that this is always a wise plan, to select enough for one, two or three years ahead against the possibility of hail, frost, or an abnormally poor tobacco season, and hence poor seed. One year without this precaution might undo the work of years of careful and painstaking selection.

In conclusion, we would urge a very careful study of the class of tobacco the local market demands. Having found this type, then give a most careful and painstaking attention to the improvement of this type, to the end that there may be an increased yield of better quality. This will result in economical production. Part of the land now devoted to tobacco can be utilized for other crops, and part of the time now devoted to tobacco can be utilized in the solution of the many and varied problems continually and insistently before the farmer.

LEAF TOBACCO SALES FOR SEPTEMBER, 1910.

Pounds sold for producers, first hand	21,906,883
Pounds sold for dealers	548,954
Pounds resold for warehouses	1,859,298
Total	24,315,135

Supplement to October Bulletin, 1910

AGRONOMY DIVISION

North Carolina Department of Agriculture

ESTIMATES OF FOOD PRODUCTS SHIPPED INTO NORTH CAROLINA IN 1909

BY

J. L. BURGESS, Agronomist
C. M. GARREN, Asst. in Agronomy

PUBLISHED AND SENT FREE TO CITIZENS ON APPLICATION.
Entered at the Raleigh Post-office as second-class mail matter.

STATE BOARD OF AGRICULTURE

W. A. GRAHAM, Commissioner, *ex officio*, Chairman, Raleigh.

H. C. CARTER	Fairfield	First District.
K. W. BARNES	Lucama	Second District.
WILLIAM DUNN	New Bern	Third District.
H. D. EDGERTON	Louisburg	Fourth District.
R. W. SCOTT	Haw River	Fifth District.
A. T. MCCALLUM	Red Springs	Sixth District.
J. P. MCRAE	Laurinburg	Seventh District.
WILLIAM BLEDSOE	Gale	Eighth District.
W. J. SHUFORD	Hickory	Ninth District.
A. CANNON	Horse Shoe	Tenth District.

OFFICERS AND STAFF

W. A. GRAHAM	Commissioner.
ELIAS CARR	Secretary.
B. W. KILGORE	State Chemist, Director Test Farms.
FRANKLIN SHERMAN, JR.	Entomologist.
W. N. HUTT	Horticulturist.
H. H. BRIMLEY	Naturalist and Curator.
T. B. PARKER	Demonstration Work.
W. M. ALLEN	Food Chemist.
W. G. CHRISMAN	State Veterinarian.
BRONSON BARLOW	Botanist.
J. M. PICKEL	Assistant Chemist.
W. G. HAYWOOD	Fertilizer Chemist.
G. M. MCNIDER	Feed Chemist and Microscopist.
L. L. BRINKLEY	Assistant Chemist.
S. C. CLAPP	Nursery and Orchard Inspector.
S. B. SHAW	Assistant Horticulturist.
Z. P. METCALF	Assistant Entomologist.
J. A. CONOVER	Dairyman.
J. L. BURGESS	Agronomist.
G. M. GARREN	Assistant Agronomist.
E. L. WORTHEN	Soil Investigations.
*W. E. HEARN	Soil Survey.
J. Q. JACKSON	Assistant Chemist.
W. A. SMITH	Assistant Chemist.
W. H. STROUD	Assistant Chemist.
E. W. THORNTON	Assistant Chemist.
W. H. EATON	Assistant Dairyman.
E. P. WOOD	Assistant Veterinarian.

R. W. SCOTT, JR., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. MEACHAM, Superintendent Iredell Test Farms, Statesville, N. C.
JOHN H. JEFFERIES, Superintendent Pender Test Farm, Willard, N. C.
R. W. COLLET, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

* Assigned by the Bureau of Soils, United States Department of Agriculture.

LETTER OF TRANSMITTAL

RALEIGH, October 29, 1910.

To HON. W. A. GRAHAM, *Commissioner of Agriculture.*

DEAR SIR:—I have the honor to transmit herewith a manuscript covering the results of our investigation into the amounts of the different food and feed products annually shipped into this State from outside sources. The results of our investigation were not entirely satisfactory, as the great majority of the parties addressed failed to reply, and many of those who did reply gave us only a partial list of the articles called for. On the whole, however, I think the manuscript worthy of publication as a special bulletin of this Department, as it gives us a partial insight into existing conditions, and may suggest lines for future development.

Respectfully submitted.

J. L. BURGESS,
Agronomist.

ESTIMATES OF FOOD PRODUCTS SHIPPED INTO NORTH CAROLINA IN 1909

INTRODUCTION

There was a time when the farmers of North Carolina produced all the staple crops consumed in the State; but that time has passed. The recent exploitation of our water-power, our nearness to the sources of raw material from field, forest and mine, and our easy access, by our numerous railway systems, to deep water on the coast, have all combined to accelerate our growth into a leading manufacturing State, having all the demands made by such a State upon the crop-producing capacity of its agricultural districts.

When the Battle Cotton Mill was erected on Tar River, in 1816, the vast majority of North Carolinians were on the farm. But as the cotton milling industry and other manufacturing enterprises grew up many of the farmers found it more profitable to move to the mills and, with their families, work for wages than to remain on the farm, where only the bare necessaries of life could be secured on account of the general lack of markets for their surplus products.

By thus draining the rural districts the manufacturing towns have grown larger and larger, till now those farmers who chose to remain on their lands are entirely unable, by their present methods, to supply themselves and spare enough for their neighbors in the towns.

What is found in the following pages, therefore, will not be construed to mean that our farmers are not prosperous, but that the demands made on them are far in excess of the supply, and should emphasize the great opportunities offered by our local markets for investment in and operation of farm lands in this State.

Early in the year this division was directed to ascertain, so far as possible, the approximate amounts of food products shipped into the State from outside sources during 1909. Six hundred copies of the following letter and blank were addressed to secretaries of commercial clubs, mayors, traffic managers of the different railroads and leading business men of the State. From these six hundred letters only one hundred and thirty replies were received, and nine of these gave percentages rather than figures. These replies may be considered to cover from one-fifth to one-fourth of the State.

We took special pains to eliminate all duplications, so that no estimate could have been counted twice. No estimations were submitted by jobbers or wholesale dealers.

Among our replies we found but fourteen from counties with a good local market, and but two from cities that would be considered

among the leading markets of the State. The vast majority of the estimates came from small towns in strictly agricultural counties.

MY DEAR SIR:—The State Department of Agriculture is making an effort to secure some accurate statistics on the amount of food supplies shipped into the State yearly from outside sources. We will be very grateful to you, therefore, if you will oblige us by filling out the enclosed blank with the amount of those articles consumed in your town this year which were produced outside the State. If details are not at hand, a general statement of the food products consumed in your town but produced outside the State, will be appreciated. This is very valuable information for the Department and we are sure you will gladly give it. If you cannot comply with this request, kindly hand it to some one who can.

Please return the enclosed blank at your earliest convenience, and oblige.

Yours very truly,

J. L. BURGESS,
Agronomist.

By direction of the Commissioner.

THE FOLLOWING ARTICLES HAVE BEEN SHIPPED INTO THE STATE DURING 1909.

CANNED GOODS	.....**CASES**.....
FLOUR	...**BARRELS**
CURED MEAT	.....**POUNDS**....
BARRELED PORK	.....**BARRELS**.
BEEF	.....**POUNDS**....
CORN	.....**BUSHELS**.
WHEAT	....**BUSHELS**
OATS	...**BUSHELS**
HAY	..**TONS**.....
BUTTER	..**POUNDS**...

(Signed) .....

(Post-Office) .....

A large number of articles might have been added to the list, but it was deemed more expedient to call particular attention to those products, the entire consumption of which might be easily supplied by North Carolina farmers.

It will be understood that most of the figures given in this bulletin are only estimates, but these estimates have been submitted by men who were in position to know the conditions existing in their localities, and we feel that great importance should be attached to the figures given. In a few cases the railroad companies have given us data taken directly from their books, and these, of course, must be

taken as entirely correct. The prices on which the following calculations are made are assumed to be wholesale prices, or such as the farmers generally get for their produce on the general market. Since it is generally known that prices fluctuate in different localities on account of local conditions, etc., it was thought best to put the rates rather low in order to include the greatest number of cases. It will be an easy matter, however, for any one to make calculations based on the prevailing prices of commodities in his locality.

MILL FEEDS

We made no inquiry as to the amount of mill feeds shipped into the State in 1909, but in order to show the large amounts of importations of food and feed supplies which could be ascertained from carefully kept records, we append the following approximate tonnage of mill feeds shipped into the State in 1910, as shown by the records kept in the department:

TONS	**80,500**
VALUE @ $17 A TON	**$1,368,000**

WHEAT AND FLOUR

We found one hundred and seven of our replies that contained flour in their estimates and twenty-five that contained wheat. The amount and value are given below:

BARRELS OF FLOUR	**565,164**
VALUE @ $6 A BARREL	**$ 3,990,984**
BUSHELS OF WHEAT	**205,828**
VALUE @ $1.15 A BUSHEL	**$ 236,702.20**
TOTAL VALUE	**$ 4,227,686.20**

North Carolina has 31,091,200 acres of land surface, the larger portion of which is arable. We grew wheat on 570,000 acres in 1909, which produced in the aggregate 5,415,000 bushels.

Careful statisticians have estimated that each man, woman and child in the United States consumes an average of about 5 1-2 bushels of wheat a year. If these statistics be true for North Carolina we consume in a year, basing our calculation on a population of 2,200,000, about 12,100,000 bushels of wheat. This forces us to import 6,685,000 bushels to supply the demand of home consumption.

If we should increase our yields from 9.5 to 25 bushels per acre we would supply our home demand and have 2,150,000 bushels to sell each year. This increase in yield is by no means impossible. Individual yields running over 25 bushels to the acre have been reported from many places in the State. In one case, by turning in red clover

and the use of acid phosphate, on the red lands of the Piedmont section, one farmer grew 4,021 bushels on 130 acres, thus averaging over 30 bushels per acre. A number of his neighbors, by use of similar methods, grew from 30 to 40 bushels per acre on smaller tracts.

We have large areas of first-class wheat soil in the Piedmont and mountain sections of the State, while in the coastal plains region good wheat can be grown on the heavier types of the well-drained soils. We should increase both our acreage and yield of wheat.

From the foregoing statistics it will be seen that the amount of flour reported to us falls far short of making up the difference between the amount of wheat we grow and the amount we consume each year. It was estimated at the Minneapolis flour mills a few years ago that it takes four and one-half bushels of wheat to make a barrel of flour. This being true, it will be seen that instead of sending away four million dollars for flour and wheat we are really paying out not less than $8,000,000 for the Western and Northern grown product.

CURED MEAT

Next in importance is the meat supply. Statistics on cured meat, beef and barreled pork alone were called for in our letter, and among the replies one hundred and four included one or the other of these commodities in their estimates. The amounts and values are given below:

POUNDS CURED MEAT		**7,721,935**
VALUE @ 12½c. A POUND	**$**	**1,965,241.785**
BARRELS OF PORK		**195,965**
VALUE @ $25 A BARREL	**$**	**4,899,125**
POUNDS OF BEEF		**170,425**
VALUE @ 7½c. A POUND	**$**	**12,781.875**
TOTAL VALUE	**$**	**6,877,148.660**

Last year there were in the State 1,356,000 hogs; 449,000 beef cattle, and 215,000 sheep. If at the end of the year all the hogs had been slaughtered and they had dressed an average of 100 pounds apiece there would have been put on the market 135,600,000 pounds of pork. If all the beef cattle had been slaughtered, and they had dressed 400 pounds each, there would have been put on the market 178,600,000 pounds of beef. If all the sheep had been slaughtered, and they had dressed 40 pounds each, there would have been put on the market 8,600,000 pounds of mutton. There would thus have been put on the market the grand total of 323,800,000 pounds of meat in one year from the combined slaughtering of all the beeves, hogs and sheep in the State.

Careful statistics show that the average person in the United States, including men, women and children, consumes 182.6 pounds of meat in one year. Should this average be correct for North Carolina, our people consume, basing our calculation on a population of 2,200,000, about 401,720,000 pounds of meat yearly. It will be seen from these figures that, should all of our animals be slaughtered in one year, we would still have to purchase 77,920,000 pounds of meat to supply the demand. At an average price of 12 1-2 cents a pound this will amount to $9,740.000 annually.

This drain on our resources is enormous, and lends great emphasis to the need of more live stock, especially hogs, in North Carolina. There is no State in the Union where hogs can be raised more cheaply than in North Carolina. Our soils and climate are especially adapted to the peanut, soy bean, cowpea, red and alsike clovers, sweet potatoes, chufa and other cheap hog feeds, all of which flourish during the summer months. This is the latitude also where crimson clover, burr clover, hairy veteh, rape, rye, oats, etc., grow luxuriantly in the fall, winter and spring, thus providing an ample supply of feed for hogs and other farm animals the year round. Many of our farmers are taking advantage of this opportunity to produce cheap meat, and are making it pay handsomely. We urge that this line of farming be given much wider limits in the State.

CORN AND OATS

During 1909 we grew 48,686,000 bushels of corn on 2,898,000 acres, this being an average of 16.8 bushels per acre. During the past year we grew 3,234,000 bushels of oats on 196,000 acres, this being an average of 22 bushels per acre.

We had 373,000 mules and horses in the State last year. A mule or a horse at hard work will consume six pounds of oats and three pounds of corn per day. At this rate of consumption the work animals of the State will consume 25,524,390 bushels of oats and 7,322,150 bushels of corn during the year.

Among the replies to our inquiry we found ninety-six that listed corn and eighty-five that listed oats. The amounts and values are given below:

CORN, BUSHELS	**1,342,232**
VALUE @ 60 CENTS A BUSHEL	**$ 805,339.20**
OATS, BUSHELS	**706,282**
VALUE @ 45 CENTS A BUSHEL	**$ 317,826.90**
TOTAL VALUE	**$ 1,123,166.10**

From the above figures it will be seen that we had to import 22,390 bushels of oats to supply the demand in case all of our work stock were

fed the ration outlined above. Our returns of 706,282 bushels represent but a small fraction of what was really brought into the State during 1909.

Notwithstanding we grew 48,686,000 bushels of corn last year, the above figures show that we imported over 1,300,000 bushels, and this is, of course, but a small fraction of the total.

Our yields of corn and oats can be greatly increased, and that by simple and easy methods that every farmer with "forty acres and a mule" can put into practice. It has been demonstrated time and again that high yields at small cost can be produced on any of our thousands of acres of corn soils throughout the State. Last year, while the State was importing its millions of bushels of corn at high prices, a large number of our farmers were growing corn that ran anywhere from 50 to 150 bushels to the acre, at a cost ranging from 17 cents to 30 cents a bushel.

The secret of successful farming in this State lies in deep plowing, the turning under of different leguminous crops, the use of phosphate, and, in some cases, potash and lime, and frequent shallow cultivation in case of hoed crops. There are other material aids, but these are fundamental, and must be used before we can hope to supply the constantly increasing demand for the staple products of the North Carolina farm. The crying need of North Carolina is more men and better methods.

HAY

Eighty-four of our replies included hay. The amount and value are indicated below:

TONS	**22,187.5**
VALUE @ $10 A TON	**$ 221,875**

The U. S. statistics collected last year show that North Carolina produced 242,000 tons of hay on 175,000 acres, this being a yield of 1.38 tons per acre.

It has been estimated that a horse at hard labor will consume, in addition to six pounds of oats and three pounds of corn, fifteen pounds of hay per day. At this rate it requires 1,021,087.5 tons of hay to feed the work stock in the State each year. From these figures it is clear that we have to import each year 779,000 tons of hay in case our work stock is properly fed with hay. Much of this amount of hay is replaced, however, with corn fodder and stover. Nevertheless, the returns received from our inquiry represent but a small part of the annual importation of hay into the State.

The hay crop can be greatly increased by the larger use of such crops as cowpea, soy bean, millet and many of the domesticated grasses.

BUTTER

Forty-one of the replies included butter. The amount and value are given below:

POUNDS	248,265
VALUE @ 20 CENTS A POUND	$ 49,653.00

It is a matter of common knowledge that most of the butter used in the State is shipped from Northern and Western creameries. The dairy business has a bright future with us, and a number of our leading citizens are becoming interested financially in the better breeds of dairy cattle, and are erecting silos and installing creameries in different parts of the State. The local demand for dairy products is great, and is waiting to be supplied or is being supplied from outside sources.

CONCLUSION

The State has, roughly speaking, five agricultural divisions, namely, the cotton district, the tobacco district, the grain district, the trucking district and the fruit district. Of course these divisions all merge into each other more or less, but to most people of the State these districts are pretty well defined.

We urge that *every farmer raise all of his staple food products at home;* but after this demand has been met it would not, in all probability, be economy for each of these districts to try to produce all of the supplies it consumes. Generally speaking, the cotton district is not adapted to wheat on a commercial scale, and it would, therefore, in most cases, be unwise to replace cotton with wheat. Again, the tobacco district is not well suited to wheat, corn and meat production on a commercial scale, and there the money crop will continue to be tobacco. The cereal district is not well suited to tobacco, cotton and fruit, hence its main crops will continue to be grains and meat. The great fruit section must continue to grow fruit, etc.

But what we urge is that each district, after raising its home supplies, exploit, to the fullest extent, its own natural resources, so that the other districts may have their needs supplied by home-grown products. We hardly expect Pasquotank, New Hanover and other similar counties, with large cities, to grow enough for their needs, but we do expect them to be able to buy from Alamance, Iredell, Davidson, Randolph, or one of the other grain and meat producing counties, and not be compelled to ship this product from the West.

A number of the replies received gave percentage estimations rather than actual figures. The consensus of opinion among the men who submitted percentage estimations was that in their towns, and some of these were among the largest we have, fully 75 per cent of the food products were shipped in from without the State.

We feel outraged to think of having 75 per cent of our yearly food supply grown in other States. But if it costs thirty cents a day for the average person to live, basing the cost on the market value of the food he consumes, and but one-third of this amount is shipped in from without the State, we are annually sending out of the State $80,300,000 for food supplies.

Following are the totals, with estimated cost of food products shipped into the State from outside sources during 1909, as obtained from the one hundred and thirty replies to the letter sent out early in the year:

CANNED GOODS, 145,456 CASES, @ $2.50 A CASE	**$ 363,640.00**
FLOUR, 665,164 BARRELS, @ $6 A BARREL	**3,990,984.00**
CURED MEAT, 7,721,935 POUNDS, @ 12½c. A POUND	**965,241.87**
BARRELED PORK, 195,965 BARRELS, @ $25 A BARREL	**4,899,125.00**
BEEF, 170,425 POUNDS @ 7½c. A POUND	**12,781.87**
CORN, 1,342,232 BUSHELS, @ 60 CENTS A BUSHEL	**805,339.20**
WHEAT, 205,828 BUSHELS, @ $1.15 A BUSHEL	**236,702.20**
OATS, 706,282 BUSHELS, @ 45 CENTS A BUSHEL	**317,826.90**
HAY, 22,187.5 TONS, @ $10 A TON	**221,875.50**
BUTTER, 248,265 POUNDS, @ 20 CENTS A POUND	**49,653.00**
TOTAL	**$ 11,863,169.54**

If we allow the above total to represent one-fifth of the food supplies shipped into the State it will be seen that we are sending away to other States annually $4,990,847.70 more than the entire value of the cotton crop of the State in 1909, which was, rating the lint at 15 cents a pound and the seed at 40 cents a bushel, $54,325,000.

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE

RALEIGH

Volume 31--No. 11. NOVEMBER, 1910. Whole Number 142.

STOCK FEEDS

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER.

STATE BOARD OF AGRICULTURE

W. A. Graham, Commissioner, *ex officio* Chairman, Raleigh.

H. C. Carter	Fairfield	First District.
K. W. Barnes	Lucama	Second District.
William Dunn	New Bern	Third District.
Ashley Horne	Clayton	Fourth District.
R. W. Scott	Haw River	Fifth District.
A. T. McCallum	Red Springs	Sixth District.
J. P. McRae	Laurinburg	Seventh District.
William Bledsoe	Gale	Eighth District.
W. J. Shuford	Hickory	Ninth District.
A. Cannon	Horse Shoe	Tenth District.

OFFICERS AND STAFF

W. A. Graham	Commissioner.
Elias Carr	Secretary.
B. W. Kilgore	State Chemist, Director Test Farms.
Franklin Sherman, Jr.	Entomologist.
W. N. Hutt	Horticulturist.
H. H. Brimley	Naturalist and Curator.
T. B. Parker	Demonstration Work.
W. M. Allen	Food Chemist.
W. G. Chrisman	State Veterinarian.
Bronson Barlow	Botanist.
J. M. Pickel	Assistant Chemist.
W. G. Haywood	Fertilizer Chemist.
G. M. MacNider	Feed Chemist and Microscopist.
L. L. Brinkley	Assistant Chemist.
S. C. Clapp	Nursery and Orchard Inspector.
S. B. Shaw	Assistant Horticulturist.
Z. P. Metcalf	Assistant Entomologist.
J. A. Conover	Dairyman.
J. L. Burgess	Agronomist.
E. L. Worthen	Soil Investigations.
*W. E. Hearn	Soil Survey.
J. Q. Jackson	Assistant Chemist.
W. A. Smith	Assistant Chemist.
W. H. Strowd	Assistant Chemist.
E. W. Thornton	Assistant Chemist.
W. H. Eaton	Assistant Dairyman.
E. P. Wood	Assistant Veterinarian.
F. S. Puckett	Assistant to Director Test Farms.

R. W. Scott, Jr., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. Meacham, Superintendent Iredell Test Farm, Statesville, N. C.
John H. Jefferies, Superintendent Pender Test Farm, Willard, N. C.
R. W. Collett, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

*Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, November 1, 1910.

SIR:—I submit herewith manuscript covering the inspection and analysis of concentrated stock feeds during the past year. I recommend its publication, as heretofore, as the November Bulletin.

Very respectfully,

B. W. KILGORE,
State Chemist.

To HON. WILLIAM A. GRAHAM,
Commissioner of Agriculture.

LEAF TOBACCO SALES FOR OCTOBER, 1910.

Pounds sold for producers, first hand	25,632,064
Pounds sold for dealers	708,836
Pounds resold for warehouses	1,414,587
Total	27,755,487

EIGHTH REPORT ON CONCENTRATED FEEDS AND COTTON-SEED MEAL.

By G. M. MacNIDER, Feed Chemist and Microscopist,

assisted by

E. W. THORNTON and W. H. STROWD, Assistant Chemists.[1]

Since the publication of the last Report on Concentrated Feeds, 550 samples of feeds and 110 samples of cotton-seed meals have been analyzed, making a total of 660 samples.

The number of samples of each class of feed are as follows:

Wheat Bran and Mixed Brans	56
Middlings or Shorts	69
Bran and Shorts	13
Shipstuff	41
Rye Feeds	5
Corn and Oat Feeds	17
Rice Feeds	13
Molasses Feeds	23
Alfalfa Feeds	27
Beet Pulp	3
Chop Feeds and Meals	18
Cotton-seed Meal Feeds	29
Peanut Feeds	3
Gluten Feed	1
Cracked Corn	30
Special Mixed Feeds	32
Poultry Feeds	35
Miscellaneous Mixed Feeds	54
Microscopic Examinations on Feeds not analyzed	81
Cotton-seed Meals	110
Total	660

SUMMARY OF THE REQUIREMENTS OF THE STATE FEED LAW.

A copy of the State Feed Law, together with the rulings and standards adopted by the Board of Agriculture, will be mailed upon request. The following brief summary gives the chief points of the law, with which every manufacturer must comply before offering feeds for sale in this State:

All feeds offered for sale in this State shall be in standard weight packages of 25, 50, 75, 100, 125, 150, 175 and 200 pounds.

[1] Some of the determinations of fiber, moisture and ash were made by J. K. Plummer.

The packages or bags shall bear a plain statement of the name, brand or trade-mark under which the feed is sold; the name and address of the manufacturer, jobber or importer; the names of each and all the ingredients of which the feed is composed, and a statement of the minimum percentage of protein and fat and the maximum percentage of crude fiber and the percentage of carbohydrates.

The term "Concentrated Commercial Feeding Stuff" includes all feeds used for live stock and poultry, except hays, straws, corn stover and whole grains.

Every manufacturer selling goods in this State must register each brand with the Commissioner of Agriculture and file a statement of the requirements as stated in section 1 of the law.

The manufacturer must pay to the Commissioner of Agriculture an inspection tax of twenty cents per ton for every ton of feed offered for sale in the State. Each package must have attached to it a tax stamp, furnished by the Commissioner, showing that these charges have been paid.

Section 7 states the conditions under which feeds shall be withdrawn from sale and defines adulterants.

Section 9 gives the Board of Agriculture power to adopt such standards and regulations as may be necessary for the enforcement of the law.

It is the duty of the Department of Agriculture to regularly inspect the feeds offered for sale in the State and to see that all feeds bear the tax stamp and are properly labeled. The Department is required to collect and analyze at least one sample of every brand of feed found on sale in the State during the year and to publish the results for the benefit of those interested in this class of goods.

The Department will be glad, at any time, to furnish information regarding the character and value of any class of feed.

RESULTS OF THE ENFORCEMENT OF THE FEED LAW.

The first feed law in North Carolina went into effect in July, 1903. At that time it was found that the markets of the State were flooded with low-grade and adulterated feeds, with no branding on the bag to indicate that they were made of anything but high-grade materials. Such materials as rice chaff, ground corncobs, peanut hulls, oat hulls, etc., with very little feeding value and now classed as adulterants, were used extensively in the composition of feeds.

Since the first law went into effect the Department has made frequent inspections each year in all parts of the State, and wherever adulterated or misbranded feeds have been found they have been withdrawn from sale. The result of this work has been the steady decrease, from year to year, in the number of adulterated feeds on the market and the steady increase in the quality of the feeds of all classes. With the publication of this, the eighth report on feeds,

it will be noticed that there are very few cases of adulteration reported. Following each table of analyses will be found a statement of the number of samples which fail to come up to the manufacturer's guarantee. While this number is comparatively large in some classes of feeds, it will be noticed in the majority of cases that the difference between the analysis and the guarantee is comparatively small. This trouble is due largely to the manufacturers not adhering close enough to the chemical analysis of their products in making up the guarantees for them.

The present law requires the statement on the bag or tag of the ingredients of which the feed is composed. Several seizures have been made during the year on account of this requirement not being complied with; but as a rule the manufacturers have shown a willingness to state what ingredients their feeds are composed of, and it is believed that this requirement will make the mixed feeds put on the markets of higher grades than in previous years.

A few cases of adulteration have been found, in which a small amount of corn meal had been mixed with wheat shipstuff. Such cases are not considered as serious adulteration and there has been no trouble in adjusting the matter with the manufacturers.

In some of the corn products it was found that corn bran had been used in such amount as to cause the feed to fall considerably below its guarantee. In such instances the manufacturers have either changed the composition of the feed or reduced their guarantee on protein and fat so as to conform with the analysis.

In the examination of cracked corn only one sample was found which contained damaged corn. This shows up remarkably well for the large amount of this product used in the eastern part of the State.

The most serious cases of adulteration have been with one brand of molasses feeds, Mueller's Molasses Grains. The examination of several samples of this feed have shown them to be adulterated with rice hulls and ground corn cobs. Only a small amount of this feed was found on the markets during the early part of the season and owing to the continued efforts of the Department this feed is now very seldom found on the markets of the State.

During the latter part of the season one lot of low-grade rice bran was shipped into the State. This was found before it was offered for sale, and as the analysis showed it to be low grade, containing an excessive amount of rice hulls, its sale was prohibited in the State.

The results of the chemical and microscopic analyses of the samples of feed taken by the inspectors of the Department during the past year, on the whole, show a remarkably clean grade of products with very little adulteration. This is due to the efforts of the Department in enforcing the feed law, and as the work is extended each year the markets of the State will be kept free from adulterated and misbranded feeds.

PURCHASING FEEDS.

The present high prices of feeds have created a market for low-grade materials, that is, materials low in protein and fat and high in fiber, which under other circumstances would not find a ready sale. While many of these feeds are of good quality, so far as maintaining their guarantee is concerned, still the average farmer grows sufficient hay, straw and other materials low in protein and fat to supply his needs, and it is therefore to his advantage in buying concentrated feeds not to buy a feed low in protein and fat and high in fiber, but to get the largest possible amount of protein and fat for the money invested. This can best be done by paying strict attention to the guarantees made for the different brands of feeds and comparing them with the analyses of the same brands made by this Department, and buying only those which come up to the guarantees. Then if the prices of several feeds, all of which come up to the guarantees, are compared with the guarantees, and the one selected which gives the largest amount of protein and fat and the smallest amount of fiber for the money invested, the purchaser will in this way get the best returns for his money.

Every feed dealer, to protect himself and his trade, should insist on feeds being shipped him in strict compliance with the law. If he will do this and not buy from those manufacturers who do not comply with the law, he will save considerable trouble and inconvenience by having his feeds seized and confiscated by feed inspectors.

THE CHEMISTRY OF FEEDS.

In the chemical analysis of feeds the following determinations are made: protein, fat, fiber, nitrogen-free extract, moisture and ash. Without going into a detailed description of the chemical properties of these classes of substances, the following general discussion will be found valuable in interpreting the analysis of commercial feeds:

PROTEIN.

The term protein or crude protein as used in feed analysis includes all the nitrogenous compounds contained in the feed. These compounds are divided, chemically, into two classes—the true proteins and the amido compounds. Familiar examples of the true proteins are the white of egg, lean meat and the gluten of flour. In seeds and cereal products the amido compounds are present in very small amount, and hence all the nitrogen is regarded as present in the form of protein. The protein compounds contain, approximately, 16 per cent of nitrogen, so to determine the amount of protein in a feed the total amount of nitrogen is determined, and this, multiplied by the factor 6.25, gives the amount of protein.

The protein compounds are of very great importance in feeds, for it is from them that the animal derives the nitrogenous materials from which its muscular tissues are built.

FATS.

Fats, or more properly termed ether extract, include all the substances soluble in dry ether. These substances include the pure fats, such as cotton-seed oil, linseed oil, etc., and the waxes, resins, chlorophyl, etc. In most feeds the waxes and resins are present in such small amount that the entire ether extract may be regarded as fat. In a few feeds, such as alfalfa products, the ether extracts the chlorophyl or green coloring matter of the plants. This amounts to only a small per cent.

CRUDE FIBER.

The term crude fiber includes the woody parts or the structural materials of plants. It is composed largely of cellulose and is the most indigestible part of the feed. As a rule, a feed with a high percentage of fiber is considered to be a low-grade feed.

MOISTURE.

Water is present to some extent in all classes of feed. Hays and commercial feeds usually contain from 6 to 15 per cent of water.

ASH.

Ash is the inorganic or mineral matter of plants. It is composed principally of soda, potash, lime and magnesia, combined in the form of phosphates, sulphates, chlorides and carbonates. The constituents of the ash furnish the material for the bony structure of animals and is used only to a small extent in the tissues and organs.

NITROGEN-FREE EXTRACT.

The term nitrogen-free extract includes the non-nitrogenous constituents of feeds. The principal classes of substances included in this term are the sugars, starch, organic acids, pentosans, etc. In the ordinary feed analysis the nitrogen-free extract is determined by difference; the sum of the percentages of protein, fats, fiber, moisture and ash is subtracted from 100, and the remainder considered as nitrogen-free extract.

CARBOHYDRATES.

The term carbohydrates includes the nitrogen-free extract and the crude fiber. In publishing the analyses the nitrogen-free extract and the crude fiber are reported separately. To get the per cent of carbohydrates in a feed it is only necessary to add the percentages of these two constituents.

The percentage of carbohydrates as stated in the manufacturer's guarantee should be, as above stated, the sum of the per cent of nitrogen-free extract and the per cent of crude fiber.

The following classification will give a clearer understanding of the facts presented above:

Protein (N x 6.25) { True proteins. / Amido compounds.

Fats (Ether Extract) { True fats. / Waxes, resins, organic acids, chlorophyl, etc.

Carbohydrates { Nitrogen-free extract. { Sugars, / Starch, / Pentosans, etc. / Crude fiber.

MICROSCOPIC ANALYSIS OF FEEDS.

In addition to the regular chemical analysis, all the feed samples are examined microscopically. This is the final test of their purity.

The chemical analysis shows the percentage amounts of the nutritive constituents of the feed, but it gives no idea of the source from which they are derived, and as the protein and fat are more digestible and hence more valuable in some classes of feeds than in others, it is very important to know just what substances go to make up the feed. The microscopic examination is the only way this can be done with any degree of accuracy.

The chief use of the microscope in feed analysis is in the detection of adulterants and in the detection of the use of spoiled or low-grade seeds. Many feeds are now put on the market in finely ground condition, and as this destroys the characteristic appearance of the ingredients, it is very easy to adulterate them with finely ground rice chaff, corncobs or peanut hulls. All of these substances have characteristic elements which are readily distinguished under the microscope.

For example, if a mixed feed contains 15 per cent of fiber it would not be considered low grade, provided it is made from good materials; but if the microscopic examination shows that part of this fiber is furnished by rice chaff or corncobs it would be considered a very low-grade feed.

DESCRIPTION AND COMPOSITION OF THE BY-PRODUCTS USED FOR FEED.

The materials used for commercial feeds are usually the by-products of other industries, such as the by-products from flour mills, oil mills, etc. The composition of these materials varies somewhat with the season in which they are grown, the method of milling, etc.; but within reasonable limits the standard grades of these by-products have a very similar composition. The following general descriptions of these products, with the average analyses, compiled from a large number of analyses[1], will show what the compositions of each one of these products should be.

[1]The analyses used in these descriptions marked (†) are taken from Bulletin No. 11, Office of Experiment Stations, U. S. Department of Agriculture. Those not so marked are compiled from analyses made in this laboratory.

WHEAT PRODUCTS.

Bran.—This consists of the outer portion or covering of the wheat grain. It contains the greater portion of the fibrous material of the grain, but is also rich in protein and fat. Average analyses (104 samples): Protein 15.38 per cent; fat 4.63 per cent; fiber 8.30 per cent; nitrogen-free extract 55.08 per cent; water 9.87 per cent; ash 6.74 per cent.

Winter Wheat Bran.—Analysis: Protein 15.87 per cent; fat 4.72 per cent; fiber 8.45 per cent; nitrogen-free extract 55.60 per cent; water 8.43 per cent; ash 6.93 per cent.

Spring Wheat Bran.—Analysis: Protein 14.62 per cent; fat 5.43 per cent; fiber 11.15 per cent; nitrogen-free extract 54.26 per cent; water 8.51 per cent; ash 6.03 per cent.

Middlings or Shorts.—These terms are used, generally, interchangeably in the trade and are used to describe the various products intermediate between bran and flour, some being composed largely of the starchy matter, while others contain more of the fibrous tissues of the grain.

Average analysis (99 samples) of goods sold under the name middlings or shorts: Protein 16.84 per cent; fat 5.07 per cent; fiber 5.66 per cent; nitrogen-free extract 58.44 per cent; water 9.47 per cent; ash 4.52 per cent.

In addition to the products sold under the general terms of middlings, shorts or standard middlings, the following grades of middlings are made, depending on the process of milling and the parts of the grain of which they are composed.

Flour Middlings.—Average analysis: Protein 17.54 per cent; fat 6.14 per cent; fiber 4.10 per cent; nitrogen-free extract 59.30 per cent; water 8.82 per cent; ash 4.10 per cent.

Red Dog Middlings.—Average analysis (13 samples): Protein 17.15 per cent; fat 5.41 per cent; fiber 2.34 per cent; nitrogen-free extract 61.82 per cent; water 9.68 per cent; ash 3.60 per cent.

Shipstuff.—The term shipstuff should be applied only to mixtures of wheat products. It is generally applied to mixtures of bran and middlings and reground bran. It is frequently misused and applied to mixtures of wheat products and corn chops or corn bran, and sometimes to a mixture of wheat, corn and oat products. Such products should be branded Feed or Mixed Feed, and not Shipstuff.

The following analysis is the average of forty-three samples of pure wheat shipstuff: Protein 15.98 per cent; fat 4.87 per cent; fiber 5.67 per cent; nitrogen-free extract 60.03 per cent; water 8.98 per cent; ash 4.47 per cent.

RYE PRODUCTS.

The by-products from the milling of rye are very similar to those from wheat.

Bran.—Average analysis: Protein 14.70 per cent; fat 2.80 per cent; fiber 3.50 per cent; nitrogen-free extract 63.80 per cent; water 11.60 per cent; ash 3.60 per cent.†

Middlings.—Average analysis (7 samples): Protein 16.07 per cent; fat 3.79 per cent; fiber 4.41 per cent; nitrogen-free extract 60.95 per cent; water 10.50 per cent; ash 4.28 per cent.

CORN PRODUCTS.

Bran.—This is the outer coating of the corn grain. It has a low feeding value and is used to some extent as an adulterant for wheat products. Its chief use is in mixed feeds and corn chops. Average analysis (2 samples): Protein 7.00 per cent; fat 2.82 per cent; fiber 11.89 per cent; nitrogen-free extract 65.44 per cent; water 11.08 per cent; ash 1.77 per cent.

Corn Chops.—This product is quite variable in the ingredients of which it is composed, sometimes being composed of the entire grain and ground rather coarse, while in other cases it is composed of parts of the grain with the addition of reground bran and cob meal. The following analysis is the average of seven samples of corn products: Protein 8.78 per cent; fat 5.04 per cent; fiber 5.22 per cent; nitrogen-free extract 71.50 per cent; water 7.68 per cent; ash 1.78 per cent. Other names used for this class of products are Hominy Feed and Hominy Chops.

Corn and Cob Meal.—Corn, together with the cob which bears it, are frequently ground together to form what is known as corn and cob meal. In such cases the cobs are not considered an adulterant, provided the amount of cobs does not exceed that which would normally be present with the grain, *i. e.*, 14 pounds of cobs to 56 pounds of grain. Average analysis: Protein 8.50 per cent; fat 3.50 per cent; fiber 6.60 per cent; nitrogen-free extract 64.80 per cent; water 15.10 per cent; ash 1.50 per cent.†

Cracked Corn.—This is the whole grain coarsely crushed. On account of the coarseness this product is not very liable to adulteration, the only source of trouble being that it is sometimes made from low-grade or spoiled corn. Average analysis (44 samples): Protein 8.85 per cent; fat 3.98 per cent; fiber 1.93 per cent; nitrogen-free extract 73.45 per cent; water 9.82 per cent; ash 1.97 per cent.

Corncobs.—(See adulterants.)

Gluten Feed.—This is a by-product from the manufacture of starch and sugar from corn, and consists of the bran, gluten and germ, or it is all the products of the corn grain less the starch. The following brief description of the manufacture of gluten feeds was very kindly furnished the author by a prominent corn products manufacturing company.

The shelled corn as it is received at the mill is thoroughly cleaned and soaked for a few days in water until it has softened to a sufficient

degree so that it can be torn apart by mills made for the purpose and the germ or chit of the corn liberated. This is then floated off in long tanks, the remainder of the corn passing off at the bottom. The germ of the corn thus freed from the other portions is washed to remove the adhering starch, dried, ground between steel rolls, cooked in a steam cooker and pressed in hydraulic presses to remove the oil. The residue after the oil has been pressed out forms corn oil cake of commerce and is used as a cattle food to a certain extent in this country, but more especially abroad. The corn oil is used for a variety of purposes, among which the manufacture of soap and edible oils are perhaps chief. The portion of the corn remaining after the removal of the germ consists of bran, gluten and starch. This is ground in stone mills such as were formerly used in the grinding of wheat for flour, only the process throughout is a wet process. After passing through the mills the material runs onto shakers covered with silk bolting cloth, through which the starch and gluten of the corn pass, while the bran remains on the upper surface and finally shakes off at the end. The separation of the starch from the gluten is obtained by means of gravity. The mixture of starch and gluten is run onto long, slightly inclined troughs called starch tables, and as it flows slowly from one end to the other the starch settles to the bottom while the more finely divided particles of gluten remain in suspension in the water and finally flow off at the end. The gluten which was separated from the starch on the starch tables is mixed with the bran from the shakers and mixture is filter pressed to remove as much water as possible. The press cakes thus obtained are broken up, dried and ground. This material is known as gluten feed.

In some instances gluten feeds are colored with a yellow coloring matter to give them a more attractive appearance.

The acidity of gluten feeds is caused, primarily, by the protein compounds of the feed and does not detract from the value of the feed.

Average analysis (4 samples): Protein 26.06 per cent; fat 3.04 per cent; fiber 7.33 per cent; nitrogen-free extract 53.16 per cent; water 6.89 per cent; ash 3.52 per cent.

OAT PRODUCTS.

Whole oats are used to a large extent as a cattle feed. In addition to this, the by-products from the milling of oats in the manufacture of rolled oats and other breakfast foods form an important source of concentrates for feeding.

The following descriptions of the by-products from the milling of oats are taken partly from the descriptions furnished the author by a prominent manufacturer.

Oat hulls consist of the outer covering of the oat grain.

Oat middlings consist of the finer particles of the oat groat that are broken off or sifted out in the process of manufacturing rolled oats.

The middlings will include some flour and some of the finer particles of the oat groat. They are styled No. 1 and No. 2, because one is a coarser product that the other, having been sifted through different sized screens.

Nubbins or heads consist of the portion that comes off in the clipping of the oat. They include the small ends of the groat and also a very small portion of the end of the hull.

Dust is the little silken ends or hairs that grow at the end of the groat, and are taken off in the course of manufacture.

The following table shows the composition of whole oats and various by-products described above:

ANALYSES OF OAT PRODUCTS.

	Protein (Nx6.25) %	Fat (Ether Extract). %	Fiber. %	Nitrogen-free Extract. %	Water. %	Ash. %
Whole Oats	11.63	5.15	9.91	61.25	8.72	3.34
Oat Hulls	2.63	1.08	31.49	53.83	5.64	5.33
Oat Middlings, No. 1	16.38	10.22	1.02	61.39	8.03	2.96
Oat Middlings, No. 2	16.50	7.64	2.26	63.39	7.17	3.04
Oat Nubbins	16.88	6.82	4.58	61.92	6.42	3.38
Oat Dust	14.00	6.23	16.52	50.94	6.30	6.01

From these analyses it will be seen that the hulls have very little value as a feed, while the other products are comparatively rich in the nutritive elements, being high in protein and fat and low in fiber.

These by-products are put on the market in the form of oat feeds, which are mixtures of the several by-products in varying proportions according to the quality of the feed that the manufacturer wishes to make, and they are also used to a considerable extent in mixed feeds, usually sold under a trade name, where they are mixed with alfalfa meal, cracked corn, corn meal, etc.

The objection to the use of oat hulls in feeds has been that unscrupulous manufacturers have used them in large amount in mixed feeds and covered up their identity by the use of molasses or syrup. In this way they have come to be classed with the feed adulterants. When used as a diluent for the more concentrated oat products in the same manner that cotton-seed hulls are used to dilute the concentrated cotton-seed meal there can be no more objection to their use than there is to the use of cotton-seed hulls, provided they are not used in excess, and their presence is shown by the proper labeling. As will be seen from the analyses above, a very satisfactory feed can be made by properly mixing these products which can be used as an oat feed or mixed with other materials in making the mixed feeds which are in large demand on the markets at present.

RICE PRODUCTS.

The by-products from the milling of rice consists of hulls, bran and polish.

Rice Hulls.—Rice hulls are the outer coating of the rice grain. They are composed principally of fibrous material, with a large amount of mineral matter, and are worthless as a feed. The hulls are found to some extent in rice meal and bran, and when present in any considerable amount are considered as an adulterant. For analyses, see adulterants.

Rice Bran.—Rice bran is the thin coating of the grain lying next to the hull.

Average analysis: Protein, 12.10 per cent; fat, 8.80 per cent; fiber, 9.50 per cent; nitrogen-free extract, 49.90 per cent; water, 9.70 per cent; ash, 10.00 per cent.†

Rice Polish.—After the hulls and bran have been removed the rice grains are polished before being put on the market. This process removes the thin coating lying next to the rice grain. It is sold for feed under the name of rice polish.

Average analysis: Protein, 11.70 per cent; fat, 7.30 per cent; fiber, 6.30 per cent; nitrogen-free extract, 58.00 per cent; water, 10.00 per cent; ash, 6.70 per cent.†

Rice Meal.—Rice meal usually consists of a mixture of rice bran and polish, frequently with the addition of varying amounts of hulls.

Average analysis (11 samples): Protein, 11.54 per cent; fat, 11.49 per cent; fiber, 9.96 per cent; nitrogen-free extract, 47.77 per cent; water, 9.42 per cent; ash, 9.82 per cent.

DRIED BEET PULP.

Dried Beet Pulp is the by-product from the manufacture of sugar from sugar beets. After the sugar has been extracted from the ground beets the pulp remaining is dried and put on the market as a feed.

Average analysis (6 samples): Protein, 9.18 per cent; fat, 0.96 per cent; fiber, 17.71 per cent; nitrogen-free extract, 60.24 per cent; water, 8.29 per cent; ash, 3.62 per cent.

MOLASSES FEEDS.

Molasses feeds consist principally of mill by-products mixed with molasses. These feeds vary a great deal in the ingredients of which they are composed, many of them being composed of nutritious ingredients and of good quality, while others contain only low-grade materials the identity of which is covered up by molasses. The ingredients found in the feeds examined are as follows: Mill screenings (frequently containing considerable amount of weed seed), wheat middlings, malt sprouts, corn meal, oat hulls, cotton-seed meal, dried brewers' grains, barley, barley hulls, cracked corn, dried distillers'

grains, rice hulls, and a few have a small amount of salt added to them.

Molasses is a carbohydrate, and when properly mixed with materials which contain protein and fat makes a very satisfactory feed. The only danger in buying this class of goods is that some manufacturers use the molasses to cover up worthless adulterants in the feeds.

Mill screenings have been found to compose a large part of some of these feeds. This introduces into the feed a large quantity of weed seeds. Experiments at several stations have shown that in many cases weed seeds when fed to animals are not affected by the digestive process, and hence a large amount of viable weed seeds are left in the manure. When feeds contain considerable amounts of weed seeds the purchaser is not only paying for worthless materials, but is introducing weeds on his land. Oat hulls, barley hulls and rice hulls, all of which are practically worthless as feeds, have been found in considerable quantities in some of these feeds.

From the tabulated analyses it will be seen that there are several brands of molasses feeds on the market which are of good quality, and it will also be seen that there are several brands in which the molasses is used merely as a cover for low-grade materials and adulterants. The samples of Mueller's Molasses Grains examined show this brand to be a uniformly low grade and adulterated product. With the exception of this brand the molasses feeds examined this year show a decided improvement over last year in the ingredients of which they are composed. This is particularly noticeable in the amount of weed seeds present. The quantity found this year is not only less, but in many instances the screenings carrying these seeds have been ground, which prevents them from spreading noxious weeds on the farm.

The feeds sold as "Dairy Feeds" are usually from three to five per cent higher in protein than those sold as "Feeds" and "Horse and Mule Feeds." They contain some concentrated material such as cotton-seed meal or oil meal which increases the per cent of protein.

Several brands of these feeds contain a small amount of salt, ranging from one-half to one per cent. This is added to make the feed more appetizing to the animal and is not objectionable when only a small amount is added and the fact plainly stated on the label.

ALFALFA FEEDS.

The rapid growth of the industry of grinding alfalfa hay into meal has recently put on the market a large number of mixed feeds in which alfalfa is the principal ingredient. Various materials are mixed with the meal to increase the percentage of fat and make them more nearly balanced feeds. The materials which have been found in the brands on the markets are as follows: Cracked corn, oats, oat products, cotton-seed meal, linseed meal, corn meal, dried brewers' grains, wheat bran and middlings. As will be seen from the analysis,

these feeds are composed of nutritious ingredients, and in only a few cases have low-grade materials been introduced into them.

Several brands of these feeds contain a small amount of salt, ranging from a trace to a little over one-half of one per cent.

COTTON-SEED MEAL FEEDS.

Cotton-seed meal which does not come up to the standard of 6.18 per cent nitrogen may be sold as feed meal and labeled with a feed guarantee in place of a nitrogen guarantee.

During the past year there has been an increased demand for a low-grade cotton-seed meal or a meal-and-hull mixture for feeding purposes. This has caused to be placed on the market quite a number of brands of meal and hull mixtures sold under the names of "Cotton-seed Meal Feed," "Feed Meal," etc. This class of feeds vary very widely in their composition, some guaranteeing as low as ten per cent protein while others guarantee thirty-eight per cent protein.

These mixtures appear to be filling a demand for a medium grade concentrate, higher in protein than the average mill product and lower in protein than cotton-seed meal.

The purchaser should pay especial attention to the price of these mixtures as compared with cotton-seed meal to see that he is not paying a higher price for his protein in this diluted form than he is paying in the more concentrated cotton-seed meal.

LINSEED MEAL.

Linseed meal or oil meal is the residue from the extraction of oil from flaxseed. The oil is extracted by two processes, known as the old process and the new process. In the old process the oil is extracted by pressure and in the new process a solvent is used. On account of the extraction being more complete when a solvent is used, the old process meal is richer in fat, while the new process meal is slightly higher in protein.

Old Process Meal—Average analysis (2 samples): Protein, 33.87 per cent; fat, 6.08 per cent; fiber, 7.29 per cent; nitrogen-free extract, 37.89 per cent; water, 9.60 per cent; ash, 5.27 per cent.

New Process Meal—Protein, 32.20 per cent; fat, 3.00 per cent; fiber, 9.59 per cent; nitrogen-free extract, 38.40 per cent; water, 10.10 per cent; ash, 5.80 per cent.†

PEANUT MEAL.

Peanut meal is the ground cake resulting from the extraction of oil from peanuts. This makes a very rich feed. Frequently considerable quantities of peanut hulls are ground with cake. This lowers the value of the meal considerably, as the hulls are practically worthless as a feed.

Average analysis (3 samples): Protein, 29.50 per cent; fat, 11.38

per cent; fiber, 22.73 per cent; nitrogen-free extract, 26.93 per cent; water, 5.78 per cent; ash, 3.68 per cent.

BREWERY AND DISTILLERY BY-PRODUCTS.

Dried Brewers' Grains.—Dried brewers' grains are dried barley grains after they have undergone the process of malting, by which the soluble dextrin and sugar are extracted. Average analysis: Protein, 19.90 per cent; fat, 5.60 per cent; fiber, 11.00 per cent; nitrogen-free extract, 51.70 per cent; water, 8.20 per cent; ash, 3.60 per cent.†

Malt Sprouts.—The small radicles which germinate from the barley in the process of malting are known as malt sprouts. Average analysis: Protein, 23.20 per cent; fat, 1.70 per cent; fiber, 10.70 per cent; nitrogen-free extract, 48.50 per cent; water, 10.20 per cent; ash, 5.70 per cent.†

Dried Distillers' Grains.—Distillers' grains are a by-product from the manufacture of whiskey and alcohol.

In the feeds on sale in the State this year the above three products have been found only as ingredients in mixed feeds.

SPECIAL MIXED FEEDS.

In this class are grouped mixtures of two or more products which are sold under a trade name. These usually consist of wheat and corn products, in a few instances with the addition of cotton-seed meal or linseed meal.

The present feed law requires the statement on the tag of the ingredients of which a feed is composed, and with this class of feeds the purchaser should be careful to note that this statement is made on all tags.

POULTRY FEEDS.

A number of brands of poultry and chick feeds were found on the markets. The ingredients of which these feeds are usually composed are cracked corn, whole oats, barley, kaffir corn, peas, wheat, buckwheat, millet, sunflower seed, and in some brands ground limestone.

The average price of these mixtures is $2.38 per 100 pounds. Comparing this with the price of the principal ingredients, it is seen that cracked corn can be bought for $2.00, wheat for $2.00, and oats for $1.87 per 100 pounds. The consumer is, then, paying from 38 to 51 cents per 100 pounds more for the mixture than he would pay for the principal ingredients.

The chick feeds are usually composed of the same ingredients which have been partially ground.

Two brands of meat meal or beef scrap were found on the markets. These are very concentrated feeds, being high in protein and fat. The samples examined were all of good grade.

MISCELLANEOUS MIXED FEEDS.

In this class are grouped feeds which are sold under the name Mixed Feed, Mill Feed and Feed. These are usually mixtures of wheat products, wheat and corn products, and cotton-seed meal.

As with other classes of mixed feeds, the manufacturers are required to state on the tag the ingredients which compose them, and the purchaser should pay special attention to see that this is done.

SALT IN FEEDS.

It has been found that some manufacturers of mixed feeds now add salt, in small quantity, to the feeds. The molasses feeds and the alfalfa mixed feeds are usually the ones in which salt is found. A number of samples of feeds of these two classes were examined and salt was found in several of them, the amount varying from a few tenths of one per cent to slightly over one per cent. The presence of a very small amount of salt in a mixed feed is not objectionable, but in all cases where it is added the fact should be plainly stated on the tag.

ADULTERANTS.

The following materials when mixed with feeds without sufficient labeling to indicate their presence are considered adulterants: corn bran, rice hulls, ground corncobs, peanut hulls, peanut middlings, oat hulls, mill sweepings, screenings, cotton-seed hulls, and similar products.

ANALYSES OF FEED ADULTERANTS.

	Protein (N x 6.25) %	Fat (Ether Extract). %	Fiber. %	Nitrogen-free Extract. %	Water. %	Ash %
Corn Bran	7.00	2.82	11.89	65.44	11.08	1.77
Rice Hulls	3.60	0.70	35.70	38.60	8.20	† 13.20
Corn Cobs	2.40	0.50	30.10	54.90	10.70	† 1.40
Peanut Hulls	4.56	0.81	67.31			2.17
Spanish Peanut Hulls	10.12	2.70	31.33	29.98	5.89	19.98
Peanut Middlings	8.75	0.88	40.75			16.75
Oat Hulls	2.63	1.08	31.49	53.83	5.64	5.33
Wheat Screenings	13.88	2.80	3.49	64.71	10.75	4.37
Cotton-seed Hulls with lint	3.25	1.12	46.92	40.11	6.05	2.55
Cotton-seed Hulls, delinted	2.40	0.31	36.49	50.22	8.20	2.38

ANALYSES OF SAMPLES OF FEEDS. SEASON 1910.

On the following pages will be found the results of the chemical and microscopic analyses of samples of stock feeds collected by the inspectors of the Department, and those sent in by individuals, dealers and manufacturers. A study of these tabulated results will show which brands are pure and come up to the manufacturer's guarantee.

ANALYSES OF WHEAT

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3370	Pure Wheat Bran	Dunlap Milling Co., Clarksville, Tenn.	Job P. Wyatt & Sons, Raleigh	Dec. 31, '09	100
3721	....do	....do	Geo. B. Edwards Co., Rocky Mount.	July 5, '10	100
3459	....do	....do	Adams Grain and Provision Co., Charlotte.	Jan. 21, '10	75
3539	....do	Mountain City Mill Co., Chattanooga, Tenn.	G. C. Welch, Mt. Airy	Feb. 16, '10	....
3482	....do	....do	Miller & Wetmore, Hendersonville.	Jan. 29, '10	75
3376	Wheat Bran	....do	Len H. Adams, Raleigh	Dec. 1, '09	100
3380	....do	Dunlop Mills, Richmond, Va.	Crowder & Rand, Raleigh	Dec. 1, '09	100
3792	....do	Piedmont Mills, Lynchburg, Va.	Patterson Co., Greensboro	July 25, '10	100
3513	Pure Wheat Bran	....do	Matthews Grocery Co., Statesville.	Feb. 5, '10	....
3383	Wheat Bran	....do	M. T. Norris & Bro., Raleigh.	Dec. 1, '09	100
3387	....do	Dan Valley Mills, Danville, Va.	Hunter & Dunn, Raleigh	Dec. 1, '09	100
3388	....do	Harrisonburg Milling Co., Harrisonburg, Va.	Hunter & Dunn, Raleigh	Dec. 1, '09	100
3392	....do	Holt-Granite Mfg. Co., Haw River, N. C.	W. A. Myatt, Raleigh	Dec. 1, '09	75
3391	....do	Tennessee Mill Co., Estill Springs, Tenn.	Pool & Hobby, Raleigh	Dec. 1, '09	100
3397	....do	Blanton Roller Mill, Shelby, N. C.	----	----	....
3401	Bran	Hinshaw Roller Mills, Saxapahaw, N. C.	----	----	....
3403	Wheat Bran	J. P. Huffman, Elon College, N. C.	----	----	....
3352	Bran	Andrew Bowling, Staunton, Va.	----	----	....
3493	Pure Wheat Bran	Liberty Mills, Nashville, Tenn.	M. M. Shepherd, Hendersonville.	Feb. 1, '10	100
3443	....do	....do	Cochrane-McLaughlin Co., Charlotte.	Jan. 19, '10	....
3409	Wheat Bran	J. D. Manor & Co., New Market, Va.	Sterling Cotton Mills, Franklinton.	Jan. 12, '10	100
3446	Pure Wheat Bran	Henderson Roller Mill Co., Monroe, N. C.	Davidson & Wolff, Charlotte.	Jan. 19, '10	75
3741	Ballards Bran	Ballard & Ballard, Louisville, Ky.	T. P. Nash, Elizabeth City	July 8, '10	100
3485	....do	....do	S. K. Breeding & Co., Hendersonville.	Jan. 29, '10	....
3490	Wheat Bran	Read Bros., Morristown, Tenn.	Hendersonville Grocery Co., Hendersonville.	Jan. 29, '10	75
3536	....do	Stuarts Draft Milling Co., Stuarts Draft, Va.	Mt. Airy Feed Store, Mt. Airy.	Feb. 16, '10	100
3588	Pure Wheat Bran	Acme Mills and Elevator Co., Hopkinsville, Ky.	W. B. Cooper, Wilmington	Mar. 5, '10	100
3589	....do	....do	B. F. Mitchell Co., Wilmington.	Mar. 3, '10	100
3594	Wheat Bran	The Ansted & Burk Co , Springfield, Ohio.	D L. Gore & Co., Wilmington.	Mar. 3, '10	100
3612	Pure Wheat Bran	J. M. Veach Co.,Adairsville, Ga.	Owenby-Wafford Co., Murphy.	Feb. 5, '10	75
3624	Wheat Bran	Atlanta Milling Co., Atlanta, Ga.	Baker, Bizzell & Co., Goldsboro.	Mar. 9, '10	100
3725	....do	J. Allen Smith & Co., Knoxville, Tenn.	F. V. Johnston, Greenville	July 6, '10	100
3615	Pure Wheat Bran	....do	Hooker, Churchill & Co., Kinston.	Mar. 11, '10	100
3648	Wheat Bran	Goldston Milling Co., Goldston, N. C.	----	----	....
3669	Pure Wheat Bran	McNeil Milling Co., Fayetteville, N. C.	Manufacturer	April 2, '10	80

BRANS AND MIXED BRANS.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25)	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract	Moisture.	Ash.	
3370	14.50	4.00	9.50	---	15.13	4.46	9.37	55.16	8.68	7.20	Wheat bran.
3721	14.50	4.00	9.50	---	14.88	3.87	7.67	53.54	13.63	6.41	do.
3459	14.50	4.00	9.50	---	15.25	3.90	9.10	55.31	9.40	7.04	do.
3539	14.50	4.00	9.50	56.00	15.75	4.07	7.98	56.35	8.14	7.71	do.
3482	14.50	4.00	9.50	56.00	15.13	4.12	9.12	54.47	9.23	7.93	do.
3376	14.50	4.00	9.50	---	16.63	4.19	8.00	53.73	16.36	7.09	do.
3380	14.50	4.00	9.50	54.00	15.13	4.68	7.68	57.80	8.07	6.61	do.
3792	14.50	4.00	9.50	54.00	15.25	4.50	7.83	55.88	9.49	7.05	do.
3513	-----	-----	-----	-----	15.25	4.63	8.87	55.38	7.92	7.95	do.
3383	14.50	4.00	9.50	54.00	15.13	5.46	8.44	54.09	9.25	7.63	do.
3387	14.50	4.00	9.50	54.00	14.88	5.65	8.95	54.78	8.11	7.63	do.
3388	14.50	4.00	9.50	50.00	15.63	5.19	8.55	55.17	8.61	6.85	do.
3392	14.00	3.75	9.00	50.00	17.63	4.56	6.41	57.74	7.62	6.01	do.
3391	14.50	5.00	9.50	54.00	15.88	4.90	7.54	55.89	9.58	6.21	do.
3397	-----	-----	-----	-----	16.13	4.54	5.70	60.46	8.90	4.27	do.
3401	-----	-----	-----	-----	15.13	4.46	4.93	60.89	10.54	4.05	do.
3403	-----	-----	-----	-----	14.63	4.89	9.94	55.09	9.12	6.33	do.
3352	-----	-----	-----	-----	15.00	4.83	9.35	56.53	7.38	6.91	do.
3493	14.50	4.00	9.50	50.00	15.75	4.50	8.92	54.40	9.13	7.30	do.
3443	14.50	4.00	9.50	50.00	15.63	4.56	8.54	54.69	9.46	7.12	do.
3409	15.75	4.00	7.95	-----	15.50	4.37	9.80	54.46	8.53	7.34	do.
3446	14.75	4.00	9.00	-----	15.63	4.68	9.07	53.13	9.41	8.08	do.
3741	14.50	4.10	9.00	53.00	14.25	4.74	8.41	53.72	11.34	7.54	do.
3485	15.78	4.42	8.04	53.00	15.63	4.46	8.88	54.89	8.80	7.34	do.
3490	14.50	4.00	11.00	55.00	15.38	4.87	9.35	53.16	9.61	7.63	do.
3536	16.00	4.00	9.00	52.00	16.00	4.83	8.93	54.31	8.25	7.68	do.
3588	16.09	4.68	7.49	53.58	16.50	4.40	7.24	55.67	10.12	6.07	do.
3589	16.09	4.68	7.49	53.59	16.75	4.74	7.29	54.94	9.87	6.41	do.
3594	15.00	4.50	11.50	-----	15.50	4.62	10.00	52.78	9.41	7.69	do.
3612	14.50	4.00	9.50	-----	16.75	4.57	7.64	55.95	8.46	6.63	do.
3624	14.50	4.00	9.50	56.62	17.00	4.51	7.36	53.96	10.29	6.88	do.
3735	14.50	4.00	9.50	52.00	16.88	4.71	6.66	52.50	11.87	7.38	do.
3615	14.50	4.00	9.50	52.00	16.88	4.88	6.87	53.46	10.07	7.84	do.
3648	-----	-----	-----	-----	15.75	5.05	8.27	52.99	11.53	6.41	do.
3669	-----	-----	-----	-----	13.50	4.79	7.18	58.45	10.45	5.63	do.

ANALYSES OF WHEAT BRANS

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3737	Coarse Bran	Washburn-Crosby Co., Minneapolis, Minn.	F. V. Johnston, Greenville	July 6, '10	100
3688	do	do	Job P. Wyatt & Sons, Raleigh	April 19, '10	100
3713	Ben Hur Coarse Bran	Hennepin Mill Co., Minneapolis, Minn.	Boykin Grocery Co., Wilson	July 5, '10	100
3694	Winona Bran	Bay State Milling Co., Winona, Minn.	W. A. Myatt, Raleigh	May 19, '10	100
3698	Wheat Bran	Holly Grove Roller Mill, Lexington, N. C.			
3701	do	Advance RollerMill, Advance N. C.			
3739	do	J. Havens, Washington, N. C.	Manufacturer	July 7, '10	
3740	Bran	Star and Cresecnt Milling Co. Chicago, Ill.	T. P. Nash, Elizabeth City	July 8, '10	100
3751	Coarse Wheat Bran	Eagle Roller Mill Co., New Ulm, Minn.	M. J. Best & Sons, Goldsboro	July 14, '10	100
3752	Bran	Commercial Milling Co., Detroit, Mich.	Baker, Bizzell & Co., Goldsboro.	July 14, '10	100
3808	do	Herbert Lloyd, Chapel Hill, N. C.	Manufacturer	July 30, '10	
3820	do	Pidgeon Valley Mill, Waynesville, N. C.	Haywood Grocery Co., Waynesville.	Aug. 8, '10	75
3547	Wheat Bran	Forsyth Roller Mills, Winston N. C.	Farmers' Stock Co., Winston	Feb. 17, '10	100
3550	do	do	Farmers' Trade-House Co, Winston.	Feb. 17, '10	
3801	Mixed Bran	do	Farmers' Stock Co., Winston	July 26, '10	100
3803	Wheat Bran	do	Manufacturer	July 26, '10	100
3733	Bran	Pillsbury Mills, Minneapolis, Minn.	Murphy, Jenkins & Co., Tarboro.	July 6, '10	100
3756	do	do	H. C. Edwards, Kinston	July 14, '10	100
3775	Wheat Bran	Northwestern Consolidated Milling Co., Minneapolis.	Heyer Bros., Wilmington	July 18, '10	100
3822	do	Read Bros., Morristown, Tenn.	Miller & Wetmore, Hendersonville.	Aug. 9, '10	75
3827	do	Asheville Milling Co., Asheville, N. C.	Manufacturer	Aug. 9, '10	

Fifty-six samples of Wheat Bran and Mixed Brans were analyzed. Three are below the guarantee in protein; five are below the guarantee in fat, and four

ANALYSES OF MID

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3718	Standard Middlings	Washburn-Crosby Co., Minneapolis, Minn.	Geo. B. Edwards Co., Roeky Mount.	July 5, '10	100
3653	do	do	F. C. Allen & Son, Wadesboro	Mar. 23, '10	100
3371	do	do	Job P. Wyatt & Sons, Raleigh.	Dec. 1, '09	100

AND MIXED BRANS—CONTINUED.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3737	14.50	4.00	11.00	50.00	15.50	4.90	10.67	49.66	12.09	7.18	Wheat bran.
3688	14.50	4.00	11.00	50.00	16.50	5.12	9.78	49.65	11.59	7.36	do.
3713	14.50	4.00	11.00	50.00	16.88	4.77	9.26	48.93	13.19	6.97	do.
3694	15.00	4.00	11.00	45.00	15.88	4.71	8.74	51.59	12.32	6.76	do.
3698	-----	-----	-----	-----	15.25	4.62	7.96	51.98	13.47	6.72	do.
3701	-----	-----	-----	-----	15.75	4.72	7.74	53.67	12.59	5.53	do.
3739	-----	-----	-----	-----	16.38	5.08	6.37	57.49	11.24	3.44	do.
3740	15.00	4.00	10.00	-----	15.50	4.72	8.94	51.53	12.03	7.28	do.
3751	14.90	4.10	9.22	52.75	16.13	5.35	9.41	49.94	11.97	7.20	do.
3752	14.50	4.00	9.50	54.41	16.13	4.94	7.41	52.93	12.49	6.10	do.
3808	-----	-----	-----	-----	15.13	5.42	7.26	53.00	13.42	5.77	do.
3820	12.50	4.00	6.50	-----	17.38	4.91	7.01	50.54	13.77	6.39	do.
3547	14.50	4.00	9.50	-----	15.75	3.92	8.00	57.30	8.58	6.45	do.
3550	14.50	4.00	9.50	-----	14.50	3.55	5.10	64.04	8.42	4.39	Wheat bran and corn bran.
3801	14.50	4.00	9.50	-----	13.88	4.48	8.86	55.85	11.47	5.52	do.
3803	14.50	4.00	9.50	-----	15.13	4.50	7.54	56.27	10.92	5.64	Wheat bran.
3733	14.50	4.00	9.00	-----	15.50	5.44	6.02	55.41	10.57	7.06	do.
3756	14.50	4.00	9.50	-----	15.13	4.88	10.63	50.21	11.91	7.24	do.
3775	14.50	4.00	11.00	-----	16.25	5.95	10.86	48.47	11.97	6.50	do.
3822	15.00	4.00	9.50	50.00	15.50	4.75	7.88	53.04	11.87	6.96	do.
3827	14.50	4.00	9.50	-----	14.88	4.83	7.95	52.65	13.30	6.39	do.

are above the guarantee in fiber. Fifty-four of these are pure wheat brans and two are mixtures of wheat and corn bran.

DLINGS OR SHORTS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3718	15.00	4.00	8.00	55.00	17.50	5.86	6.34	53.76	11.55	4.99	Wheat middlings.
3653	15.00	4.00	8.00	-----	18.88	5.37	7.05	54.43	8.58	5.69	do.
3371	15.00	4.00	9.00	-----	18.25	6.04	7.70	52.56	10.02	5.43	do.

ANALYSES OF MIDDLINGS

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3720	Adrian Flour	Washburn-Crosby Co., Minneapolis, Minn.	Geo. B. Edwards Co., Rocky Mount.	July 5, '10	100
3755	Ben Hur Standard Middlings	Hennepin Mill Co., Minneapolis, Minn.	H. C. Edwards, Kinston	July 14, '10	100
3353	Shorts	Andrew Bowling, Staunton, Va.			
3354	Middlings	do			
3386	Wheat Middlings	M. G. Rankin & Co., Milwaukee, Wis.	Peebles Bros., Raleigh	Dec. 1, '09	100
3798	Pure Wheat Shorts	Greensboro Roller Mills, Greensboro, N. C.	Morris & Bros., Greensboro	July 25, '10	100
3410	Wheat Middlings	J. D. Manor & Co., New Market, Va.	Sterling Cotton Mills, Franklinton.	Jan. 12, '10	100
3682	Red Dog Superb	Eagle Roller Mill Co., New Ulm, Minn.	Geo. B. Edwards Co., Rocky Mount.	April 9, '10	100
3569	Middlings	do	F. E. Ramsey, Beaufort	Feb. 28, '10	100
3407	Red Dog Superb	do	P. A. Reaves, Louisburg	Jan. 12, '10	
3429	Standard Middlings	Adams Grain and Provision Co., Charlotte, N. C.	A. W. Porter & Co., Rockingham.		100
3799	Wheat Middlings	Standard Tilton Milling Co., St. Louis, Mo.	P. R. Lambe & Co., Winston	July 26, '10	100
3533	Pure Wheat Shorts	Tennessee Mill Co., Estill Springs, Tenn.	Piedmont Feed Co., Wilkesboro.	Feb. 15, '10	100
3500	do	do	Asheville Hay and Grain Co., Asheville.	Feb. 4, '10	75
3421	do	do	Adams Grain and Provision Co., Fayetteville.	Jan. 13, '10	100
3719	Pure Wheat Middlings	Dunlap Milling Co., Clarksville, Tenn.	Geo. B. Edwards Co., Rocky Mount.	July 5, '10	100
3587	do	do	John S. McEachern & Sons, Wilmington.	Mar. 5, '10	100
3442	do	do	Irwin-Graham Co., Charlotte.	Jan. 19, '10	75
3419	do	do	The Armfield Co., Fayetteville.	Jan. 13, '10	75
3709	Wheat White Middlings	C. A. Gambrill Mfg. Co., Baltimore, Md.	Wells Grocery Co., Wilson	July 5, '10	75
3632	Pure Wheat Brown Middlings.	do	Tomlinson & Co., Wilson	Mar. 17, '10	100
3622	Wheat White Middlings	do	do	Mar. 17, '10	75
3416	Pure Brown Middlings	do	J. W. Caster, Maxton	Jan. 14, '10	100
3546	Pure Wheat Middlings	Stuarts Draft Milling Co., Stuarts Draft, Va.	Cramer Bros., Winston	Feb. 17, '10	100
3534	Pure Wheat Shorts	do	Mt. Airy Feed Store, Mt. Airy	Feb. 16, '10	100
3423	Standard Middlings	James Quirk Milling Co., Montgomery, Minn.	Adams Grain and Provision Co., Fayetteville.	Jan. 13, '10	
3425	Pure Wheat Shorts	Star Mills, Nashville, Tenn.	McLaurin & Shaw, Laurinburg.	Jan. 14, '10	100
3502	do	Glen Alpine Mills, Glen Alpine N. C.	Green & Kincaid, Morganton	Feb. 8, '10	75
3603	Wheat Shorts	Spach Bros., Winston-Salem, N. C.			
3625	Wheat Middlings	Chippewa Milling Co., Montevideo, Minn.	M. J. Best & Sons, Goldsboro	Mar. 9, '10	100
3610	Pure Wheat Shorts	Liberty Mills, Nashville, Tenn.	Nolord-McIntyre Co., Asheville.	Feb. 7, '10	75
3551	do	do	Farmers' Trade House Co., Winston.	Feb. 17, '10	100
3783	Brown Shorts	Atlanta Milling Co., Atlanta, Ga.	Adams Grain and Provision Co., Fayetteville.	July 20, '10	75
3468	do	do	F. D. Barkley & Co., Gastonia.	Jan. 25, '10	75
3635	Star Middlings	Mayo Milling Co., Richmond, Va.	Planters' Trading Co., Laurinburg.	Mar. 19, '10	100

OR SHORTS—CONTINUED.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analyses. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3720	17.00	5.00	4.00	60.00	20.38	5.51	1.78	57.86	10.69	3.78	Wheat middlings (Red Dog).
3755	15.00	4.00	8.00	55.00	18.83	5.63	7.07	51.71	11.56	5.20	do.
3353	-----	-----	-----	-----	17.75	5.64	6.70	58.02	6.65	5.24	do.
3354	-----	-----	-----	-----	16.00	4.63	2.90	66.59	6.85	3.03	do.
3386	15.00	4.00	6.00	52.00	16.88	5.87	7.17	55.57	9.60	4.91	do.
3798	15.00	4.00	6.00	-----	15.50	3.87	2.61	64.83	10.15	3.04	do.
3410	16.25	5.00	4.00	-----	17.88	5.35	4.60	58.68	9.22	4.27	do.
3682	18.95	5.35	2.75	58.90	19.13	5.94	2.55	59.13	8.92	4.33	do. (Red Dog).
3569	17.00	5.00	6.00	53.00	17.00	5.30	8.02	54.48	9.67	5.53	do.
3407	16.90	4.80	9.90	-----	19.00	5.78	2.95	59.81	8.70	3.76	do. (Red Dog).
3429	15.00	4.00	8.00	-----	18.13	6.01	6.29	55.51	8.88	5.18	do.
3799	15.00	4.00	6.00	40.00	18.50	5.24	5.10	56.15	10.12	4.89	do.
3533	16.00	4.00	6.00	56.00	17.38	5.19	5.07	58.31	9.26	4.79	do.
3500	16.00	4.00	6.00	56.00	18.25	4.81	4.89	57.77	9.45	4.83	do.
3421	16.00	4.00	6.00	56.00	16.38	4.74	5.96	58.13	9.59	5.20	do.
3719	15.00	4.00	6.00	-----	17.25	4.87	5.19	56.19	11.79	4.71	do.
3587	15.00	4.00	6.00	-----	17.00	4.60	5.99	57.26	9.37	5.78	do.
3442	15.00	4.00	6.00	-----	17.13	5.08	4.69	59.17	9.85	4.08	do.
3419	15.00	4.00	6.00	-----	17.38	5.52	5.84	57.15	9.48	4.63	do.
3709	16.88	4.40	3.00	61.50	17.75	5.35	3.90	56.98	13.10	2.92	do.
3632	16.70	3.50	8.30	55.50	15.00	4.64	8.01	55.39	10.53	6.43	do.
3622	16.85	4.40	3.00	61.50	19.00	5.32	4.40	55.41	11.28	4.59	do.
3416	16.70	3.50	8.30	55.50	17.00	5.47	7.52	54.15	9.87	5.99	do.
3546	16.00	5.00	5.00	54.00	17.25	4.55	3.38	61.84	9.31	3.67	do.
3534	15.00	5.00	6.00	54.00	17.50	5.43	7.01	54.92	9.21	5.93	do.
3423	17.25	5.25	-----	-----	17.88	6.72	7.00	53.70	8.86	5.84	do.
3425	16.00	4.00	6.00	48.00	17.88	4.69	5.40	57.64	9.67	4.72	do.
3502	18.52	5.82	5.25	62.83	17.00	5.14	5.38	57.65	9.92	4.91	do.
3603	-----	-----	-----	-----	15.38	4.54	3.08	65.86	8.60	2.54	do.
3625	15.50	5.50	6.00	-----	17.88	5.44	3.84	58.94	9.97	3.93	do.
3610	16.00	4.00	6.00	48.00	16.25	4.18	5.36	61.17	8.67	4.37	do.
3551	16.00	4.00	6.00	48.00	16.75	4.42	5.57	58.76	9.40	5.10	do.
3783	15.00	4.00	6.00	-----	16.13	4.36	3.80	60.74	11.35	3.62	do.
3468	15.00	4.00	6.00	60.88	16.75	4.53	5.69	59.11	9.19	4.73	do.
3635	15.00	4.00	8.00	54.00	17.38	5.39	7.29	55.44	8.92	5.58	do.

ANALYSES OF MIDDLINGS

Laboratory Number	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3692	Winona Middlings	Bay State Milling Co., Winona, Minn.	L. H. Adams, Raleigh	May 19, '10	100
3693	Red Dog Middlings	---do	L. H. Adams, Raleigh	May 19, '10	100
3481	Pure Wheat Middlings	B. A. Eckhart Milling Co., Chicago, Ill.	W. A. Manney & Bros., Kings Mountain.	Jan. 26, '10	100
3552	---do	White Star Mills, Staunton, Va.	W. H. Turner, Winston	Feb. 18, '10	100
3599	Pure Winter Wheat Fancy Shorts.	Akin-Erskin Milling Co., Evansville, Ind.	Phillips & Penny, Raleigh	Mar. 8, '10	100
3683	Middlings	Hicks-Brown Milling Co., Mansfield, Ohio.	P. L. Woodard & Co., Wilson	April 8, '10	100
3695	Wheat Shorts	Cumberland Mills, Nashville, Tenn.	Crowder & Rand, Raleigh	May 19, '10	100
3702	---do	Advance Roller Mill, Advance N. C.			
3714	Eagle Red Dog	J. B. A. Kern & Son, Milwaukee, Wis.	Boykin Grocery Co., Wilson	July 5, '10	100
3717	Taylors Middlings	Northwestern Elevator and Mill Co., Mt. Vernon, Ohio.	P. L. Woodard & Co., Wilson.	July 5, '10	100
3723	Red Dog	Duluth Superior Mill Co., Duluth, Minn.	Matthews-Weeks Co., Rocky Mount.	July 5, '10	100
3724	Red Dog Middlings	Piedmont Mills, Lynchburg, Va.	---do	July 5, '10	100
3745	Middlings	Northwestern Consolidated Milling Co., Minneapolis.	Southern Grocery Co., Henderson.	July 9, '10	100
3817	Wheat Shorts	Waynesville Milling Co., Waynesville, N. C.	Manufacturer	Aug. 8, '10	75
3779	Wheat Middlings	B. A. Eckhart Milling Co., Chicago, Ill.	A. C. Rankin Co., Fayetteville.	July 20, '10	100
3780	Elmco Standard Middlings	Listman Mill Co., La Crosse, Wis.	Adams Grain and Provision Co., Fayetteville.	July 20, '10	75
3781	Elmco Fancy White Middlings.	---do	---do	July 20, '10	75
3815	Middlings	Hickory Milling Co., Hickory N. C.	Manufacturer	Aug. 6, '10	75
3774	Eaco Winged Horse Middlings.	Everett Augenbough & Co., Waseca, Minn.	The Stone Co., Wilmington	July 18, '10	100
3503	Wheat Shorts	Read Bros., Morristown, Tenn.	Green & Kincaid, Morganton	Feb. 8, '10	75
3821	---do	---do	Miller & Wetmore, Hendersonville.	Aug. 9, '10	75
3731	"B" Middlings	Pillsbury Mills, Minneapolis Minn.	J. R. Cuthrell & Sons, Rocky Mount.	July 5, '19	100
3590	Middlings	---do	J. V. Williams, New Bern	Mar. 1, '10	100
3544	"B" Middlings	---do	A. Valentine, Mt. Airy	Feb. 16, '10	100
3543	Daisy Middlings	---do	Beasley & Co., Mt. Airy	Feb. 16, '10	1 00
3540	"B" Middlings	---do	G. C. Sorrill & Co. Mt. Airy	Feb. 16, '10	100
3538	Daisy Middlings	---do	G. C. Welch, Mt. Airy	Feb. 16, '10	100
3537	Middlings	---do	W. B. Haymore, Mt. Airy		100
3434	---do	---do	Leak & Marshall, Wadesboro	Jan. 18, '10	100
3420	---do	---do	Adams Grain and Provision Co., Fayetteville.	Jan. 13, '10	100
3555	Red Dog Superb	Eagle Roller Mill Co., New Ulm, Minn.	Patterson Bros., Greensboro	Feb. 21, '10	100

Sixty-nine samples of Middlings were analyzed. Four are below the guarantee in protein; ten are below the guarantee in fat, and seventeen are above the guarantee in fiber.

OR SHORTS—CONTINUED.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.	
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.		
3692	17.00	5.00	8.00	50.00	18.13	4.99	5.97	55.25	10.23	5.43	Wheat middlings.	
3693	17.00	3.80	3.00	-----	18.63	4.48	2.17	61.48	8.51	4.73	do.	(Red Dog).
3481	15.00	4.00	6.00	60.00	17.13	4.69	6.27	57.63	9.33	4.95	do.	
3552	15.00	4.00	6.00	-----	17.63	4.45	2.41	63.34	9.16	3.01	do.	
3599	16.36	4.50	3.90	-----	17.38	4.39	5.53	58.03	9.68	4.99	do.	
3683	16.88	4.98	6.00	-----	15.88	4.51	5.67	59.55	9.69	4.70	do.	
3695	16.00	4.00	6.00	-----	18.13	7.31	4.82	53.47	12.04	4.23	do.	
3702	-----	-----	-----	-----	17.00	4.23	2.74	62.20	10.98	2.85	do.	
3714	19.00	5.00	1.72	69.75	21.25	6.29	2.32	54.23	11.75	4.16	do.	(Red Dog).
3717	15.00	4.00	8.00	-----	16.63	4.38	5.78	56.41	12.36	4.44	do.	
3723	17.00	4.50	4.00	-----	18.50	6.92	1.78	58.22	10.88	3.70	do.	(Red Dog).
3724	15.75	4.00	2.00	-----	16.00	3.81	2.78	63.41	11.11	2.89	do.	(Red Dog).
3745	15.00	4.50	10.00	-----	16.13	5.52	8.35	53.56	10.67	5.77	do.	
3817	15.00	4.00	8.00	-----	14.38	3.52	2.98	62.69	13.49	2.94	do.	
3779	15.00	4.00	6.00	60.00	17.75	5.26	7.03	54.19	10.72	5.05	do.	
3780	15.00	4.00	8.00	54.00	19.88	6.18	5.85	52.89	10.37	4.83	do.	
3781	15.00	3.50	2.00	54.00	17.88	4.51	3.22	60.99	10.02	3.38	do.	
3815	15.00	4.00	6.00	57.00	16.00	4.85	5.61	55.92	12.62	5.00	do.	
3774	16.00	3.00	8.00	-----	18.13	6.53	7.32	51.57	11.33	5.12	do.	
3503	15.00	4.00	8.00	60.00	17.13	4.45	4.93	59.37	9.73	4.39	do.	
3821	14.50	4.50	7.00	50.00	17.63	5.18	4.58	57.73	10.46	4.42	do.	
3731	15.00	4.50	6.00	-----	17.38	5.75	7.95	51.92	11.04	5.96	do.	
3590	15.00	4.50	8.00	-----	17.88	5.32	7.71	54.17	9.44	5.48	do.	
3544	15.00	4.50	8.00	-----	16.38	3.91	8.88	56.02	8.65	6.16	do.	
3543	16.00	4.50	4.00	-----	18.00	4.40	1.86	63.00	9.65	3.09	do.	
3540	15.00	4.50	8.00	-----	16.50	5.46	8.45	55.54	8.22	5.83	do.	
3538	14.00	4.50	4.00	-----	19.00	4.44	1.71	62.62	8.87	3.36	do.	
3537	15.00	4.50	8.00	-----	17.13	5.74	7.49	55.19	8.64	5.81	do.	
3434	16.00	4.50	8.00	-----	17.25	6.30	7.50	54.32	8.81	5.82	do.	
3420	15.00	4.50	6.00	-----	16.88	5.99	8.52	54.20	8.68	5.73	do.	
3555	18.95	5.35	2.75	58.96	19.88	6.03	2.82	57.73	9.58	3.96	do.	(Red Dog).

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3453	Pure Wheat Bran and Middlings.	Dunlap Milling Co., Clarksville, Tenn.	Charles Moody Co., Charlotte.	Jan. 21, '10	75
3457	....do	....do	Adams Grain and Provision Co., Charlotte.	Jan. 21, '10	75
3458	Bran and Shorts	Newport Mill Co., Loudon, Tenn.	....do	Jan. 21, '10	75
3463	Choice Bran and Shorts	J. Lee Koiner, Richmond, Va.	O. M. Boyd & Co., Gastonia	Jan. 25, '10	75
3390	Wheat Bran and Shorts	Koiner Flour Mills, Richmond, Va.	Hunter & Dunn, Raleigh	Dec. 1, '09	100
3364	Bran and Shorts	Glen Anna Milling Co., Thomasville, N. C.			
3506	....do	Newport Mill Co., Newport Tenn.	City Feed Co., Hickory	Feb. 8, '10	75
3472	....do	....do	F. D. Barkley & Co., Gastonia.	Jan. 25, '10	75
3501	....do	Statesville Flour Mill Co., Statesville, N. C.	J. A. Shuping, Morganton	Feb. 7, '10	75
3504	....do	....do	Piedmont Grocery Co., Hickory.		100
3508	Bran and Shipstuff	Banner Roller Mills, Lincolnton, N. C.	Manufacturer	Feb. 8, '10	75
3663	....do	Model Mills, Lexington, N. C.	R. L. Leonard, Lexington	April 1, '10	100
3699	....do	Holly Grove Roller Mills, Lexington, N. C.			

Thirteen samples of Bran and Shorts were analyzed. Three are below the guarantee in protein; two are below the guarantee in fat, and one is above the

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3621	Shipstuff	Carrolina Roller Mills, Durham, N. C.	H. Weil & Bros., Goldsboro	Mar. 9, '10	100
3406	....do	....do	P. A. Reaves, Louisburg	Jan. 12, '10	100
3382	....do	....do	J. R. Ferrall & Co., Raleigh	Dec. 1, '10	100
3432	....do	Northwestern Consolidated Milling Co., Minneapolis.	F. C. Allen & Son, Wadesboro		
3433	....do	....do	Hardison Co., Wadesboro	Jan. 18, '10	
3556	....do	Piedmont Mills, Lynchburg, Va.	Patterson Bros., Greensboro	Feb. 21, '10	100
3530	Piedmont Shipstuff	....do	F. D. Forester & Co., Wilkesboro.	Feb. 15, '10	100
3511	....do	....do	Wampum Store, Lincolnton	Feb. 8, '10	75
3471	Pure Wheat Shipstuff	....do	F. D. Barkley & Co., Gastonia.	Jan. 25, '10	75
3412	Piedmont Shipstuff	....do	McGhee-Joyner Co., Franklinton.	Jan. 12, '10	

BRAN AND SHORTS.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3453	14.50	4.00	8.00	.....	17.00	4.65	7.61	56.33	8.58	5.83	Wheat bran and middlings.
3457	14.50	4.00	8.00	.....	16.50	4.69	7.32	55.32	9.75	6.42	do.
3458	13.50	4.00	8.00	.....	16.63	4.05	6.65	58.01	9.40	5.26	do.
3463	15.00	4.00	7.53	56.00	14.88	5.04	7.62	57.04	9.10	6.32	do.
3390	15.00	4.00	7.53	56.00	16.00	5.21	6.65	58.34	8.10	5.70	do.
3364	.....	.....	.....	.....	16.25	5.01	7.90	56.86	7.82	6.16	do.
3506	14.50	4.00	8.00	.....	16.50	3.97	6.61	58.89	8.28	5.75	do.
3472	14.50	4.00	8.00	.....	16.63	4.01	6.35	58.64	8.93	5.44	do.
3501	15.53	3.80	5.95	.....	16.00	4.40	5.85	58.35	9.89	5.51	Wheat product and small amount corn product.
3501	15.53	3.80	5.95	.....	14.25	3.04	5.34	62.80	9.74	4.83	Wheat bran and middlings and small amount corn product.
3508	14.50	4.00	8.00	56.00	15.38	4.29	7.01	59.35	8.17	5.80	Wheat product.
3663	15.50	4.07	7.10	.....	14.75	6.20	6.02	58.53	8.86	5.64	Wheat bran and middlings.
3699	.....	.....	.....	.....	14.88	5.47	6.03	56.01	12.78	4.83	do.

guarantee in fiber. Eleven of these samples are wheat products and two are wheat and corn products.

SHIPSTUFF.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3621	15.75	4.00	8.75	.....	15.38	4.50	5.68	59.81	9.58	5.05	Wheat and corn product.
3406	16.00	4.00	5.00	64.00	16.38	4.64	6.80	58.21	8.58	5.39	do.
3382	15.75	4.00	8.75	.....	15.25	5.52	6.51	57.39	10.00	5.33	Wheat product.
3432	15.55	5.25	10.00	.....	17.88	6.05	6.77	54.67	9.28	5.35	do.
3433	15.75	5.25	10.00	.....	16.50	5.98	8.44	54.24	9.05	5.79	do.
3556	15.00	4.00	8.00	58.00	16.75	5.18	6.79	55.75	10.39	5.14	do.
3530	15.00	4.00	8.00	56.00	16.75	4.86	6.46	57.77	9.33	4.83	do.
3511	15.00	4.00	8.00	56.00	16.38	4.84	5.99	59.30	8.48	5.01	do.
3471	15.00	4.00	6.00	56.00	17.25	4.90	6.68	56.81	9.00	5.36	do.
3412	15.00	4.00	8.00	50.00	16.25	4.59	5.96	59.22	8.99	4.99	do.

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3385	Wheat Shipstuff	Piedmont Mills, Lynchburg, Va.	M. T. Norris & Bro., Raleigh	Dec. 1, '09	100
3486	Ballard's Shipstuff	Ballard & Ballard Co., Louisville, Ky.	S. K. Breeding & Co., Hendersonville.	Jan. 29, '10	100
3466	Shipstuff	do	J. Flem Johnson Co., Gastonia.	Jan. 25, '10	75
3439	Ballard's Shipstuff	do	Crowe Bros., Monroe	Jan. 19, '10	100
3414	do	do	A. E. Rankin Co., Fayetteville.	Jan. 13, '10	100
3411	do	do	B. W. Ballard Co., Franklinton.		100
3598	Shipstuff	Harrisonburg Milling Co., Harrisonburg, Va.	Phillips & Penny, Raleigh	Mar. 8, '10	100
3553	do	do	W. H. Turner, Winston	Feb. 18, '10	100
3428	do	do	E. W. Covington & Co., Rockingham.	Jan. 15, '10	100
3427	do	do	A. P. Barrell, Rockingham	Jan. 15, '10	100
3404	do	J. P. Huffman, Elon College, N. C.			
3607	do	Pidgeon Valley Milling Co., Waynesville, N. C.	Haywood Grocery Co., Waynesville.	Feb. 4, '10	75
3608	do	The Hanson Mill Co., Dillsboro, N. C.	J. C. Bennett Co., Waynesville.	Feb. 4, '10	75
3628	do	Mayo Milling Co., Richmond, Va.	W. C. Moye & Son, Goldsboro.	Mar. 9, '10	100
3638	do	M. G. Rankin & Co., Milwaukee, Wis.	McQueen & McQueen, Maxton.	Mar. 18, '10	100
3645	do	Atlanta Milling Co., Atlanta, Ga.	Adams Grain and Provision Co., Fayetteville.	Mar. 17, '10	75
3655	do	Henderson Snyder Co., Monroe, N. C.	A. C. Dawson, Monroe	Mar. 24, '10	100
3802	Wheat Shipstuff	Forsyth Roller Mills, Winston, N. C.	Manufacturer	July 26, '10	100
3807	Shipstuff	Herbert Lloyd, Chapel Hill, N. C.	do	July 30, '10	
3814	do	Hickory Milling Co., Hickory, N. C.	Morrison Provision and Produce Co., Hickory.	Aug. 6, '10	100
3791	Wheat Shipstuff	Dan Valley Mills, Danville, Va.	Elmore Maxwell Co., Greensboro.	July 25, '10	100
3548	do	do	Farmers Stock Co., Winston	Feb. 17, '10	100
3528	do	do	C. C. Gentry & Co., Elkin	Feb. 15, '10	100
3505	Shipstuff	J. Allen Smith & Co., Knoxville, Tenn.	City Feed Co., Hickory	Feb. 8, '10	100
3743	do	do	T. P. Nash, Elizabeth City	July 8, '10	100
3828	Wheat Shipstuff	Statesville Flour Mill Co., Statesville, N. C.	Asheville Grocery Co., Asheville.	Aug. 10, '10	75
3497	do	do	do	Feb. 3, '10	75
3465	do	do	J. Flem Johnson & Co., Gastonia.	Jan. 25, '10	75
3336	Shipstuff	The Dunlop Mills, Richmond Va.	J. D. Horn, Wadesboro	Jan. 18, '10	100
4527	do	do	The Atkinson Co., Elkin	Feb. 15, '10	100
3605	do	Clyde Roller Mills, Clyde, N. C.	Feed and Lumber Co., Waynesville.	Feb. 5, '10	

Forty-one samples of Shipstuff were analyzed. Seven are below the guarantee in protein; ten are below the guarantee in fat, and five are above the guarantee in fiber. Thirty-five of these samples are wheat products and six are wheat and corn products.

SHIPSTUFF—CONTINUED.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3385	15.00	4.00	6.00	56.00	16.63	5.87	6.84	56.23	9.07	5.36	Wheat product.
3486	16.45	4.60	6.42	55.00	17.63	4.01	4.82	60.02	9.06	4.46	do.
3466	16.45	4.60	6.42	55.00	14.88	3.21	5.04	62.76	9.61	4.50	do.
3439	16.45	4.60	6.42	58.00	16.38	3.83	5.28	60.90	9.49	4.12	do.
3414	15.78	4.42	8.01	-----	16.00	4.10	4.43	61.26	10.66	3.65	do.
3411	16.45	4.60	6.42	55.00	17.63	3.55	4.23	61.41	9.36	3.82	do.
3598	15.00	4.50	7.00	50.00	17.00	5.12	4.51	59.62	9.65	4.10	do.
3553	15.00	5.50	7.00	50.00	17.38	5.28	4.45	60.63	8.19	4.07	do.
3428	15.00	4.50	7.00	50.00	18.25	6.08	6.44	54.84	9.17	5.22	do.
3427	15.00	4.50	7.00	50.00	17.75	5.49	5.02	58.38	9.16	4.20	do.
3404	-----	-----	-----	-----	14.25	5.19	4.16	61.29	11.88	3.23	do.
3607	12.00	4.00	8.00	-----	15.75	4.28	5.03	62.05	8.91	3.98	do.
3608	-----	-----	-----	-----	12.63	3.96	4.70	65.59	9.32	3.80	Wheat and corn products, corn bran.
3628	15.62	3.95	6.00	-----	17.38	4.57	7.05	54.49	10.55	5.96	Wheat product.
3638	15.00	4.00	8.00	52.00	-----	-----	-----	-----	-----	-----	do.
3645	14.50	4.00	8.00	58.62	15.63	3.52	4.10	62.66	10.38	3.71	do.
3655	16.00	4.00	6.00	48.00	17.88	4.39	5.75	57.59	9.63	4.76	do.
3802	15.00	4.00	6.00	-----	15.50	4.56	4.52	65.16	6.34	3.92	do.
3807	-----	-----	-----	-----	11.63	2.59	4.39	64.02	13.68	3.69	do.
3814	14.50	4.00	8.00	55.00	15.25	4.73	5.72	56.75	12.26	5.29	do.
3791	15.00	4.00	6.00	56.00	16.63	5.02	5.66	58.13	9.82	4.74	do.
3548	15.00	4.00	8.00	58.00	16.00	4.98	5.62	58.46	10.01	4.93	do.
3528	15.00	4.00	6.00	56.00	16.13	4.41	5.82	60.03	8.75	4.86	do.
3505	16.50	4.00	7.00	58.00	15.88	3.88	6.94	59.11	8.56	5.63	Wheat product and small amount of corn product.
3743	16.50	4.00	7.00	58.00	16.63	3.92	7.39	55.46	10.84	5.76	Wheat product.
3828	15.00	4.00	7.00	60.00	14.50	4.31	4.98	63.15	8.71	4.35	Wheat and corn product.
3497	16.00	4.00	6.75	-----	15.50	4.57	6.36	59.04	9.26	5.27	Wheat product and corn bran.
3465	16.00	4.00	6.75	-----	16.00	3.96	6.13	58.97	9.72	5.22	Wheat product.
3436	14.50	4.00	7.00	54.00	16.38	4.52	6.09	58.56	9.50	4.95	do.
3527	14.50	4.00	7.00	54.00	16.75	4.86	5.98	58.24	8.91	5.26	do.
3605	-----	-----	-----	-----	15.13	3.72	4.36	63.59	9.46	3.74	do.

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3793	Rye Middlings	Washburn-Crosby Co., Minneapolis, Minn.	Patterson Co., Greensboro	July 25, '10	100
3790	do	North Star Feed and Cereal Co., Minneapolis, Minn.	Elmore Maxwell Co., Greensboro.	July 25, '10	100
3647	do	do	do	Mar. 21, '10	100
3576	Rye Feed	M. G. Rankin & Co., Milwaukee, Wis.	W. R. White & Co., Elizabeth City.	Feb. 23, '10	100
3575	do	do	Zimmerman & Co., Elizabeth City.	Feb. 23, '10	100

Five samples of Rye Feeds were analyzed. All came up to the guarantee.

ANALYSES OF CORN

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3777	Excelsior Feed	Great Western Cereal Co., Chicago, Ill.	O. H. Wright & Co., Wilmington.	July 18, '10	100
3776	Boss Feed	do	W. B. Cooper, Wilmington	July 18, '10	100
3582	Boss Chop Feed	do	S. P. McNair & Co., Wilmington.	Mar. 3, '10	100
3525	Oat Feed	do			
3710	Corn and Oat Chop	Early & Daniel Co., Cincinnati, Ohio.	Wells Grocery Co., Wilson	July 5, '10	100
3704	Corn and Oats Mill Feed	Advance Roller Mill, Advance, N. C.			
3670	Cracked Corn and Oats	McNeil Milling Co., Fayetteville, N. C.	Manufacturer	April 2, '10	80
3646	Schumacher Stock Feed	The Quaker Oats Co., Chicago, Ill.	Scott-Sparger Co., Greensboro.	Mar. 19, '10	100
3524	Oat Feed	do			
3515	Corn and Oat Chops	J. W. Isler & Co., Goldsboro, N. C.			
3696	do	do			
3754	do	do	Manufacturer	July 14, '10	100
3613	Corn and Oat Feed	P. A. Hooker, Kinston, N. C.			
3758	Cracked Corn and Oats	do	Manufacturer	July 14, '10	75
3580	Mixed Corn and Oat Feed	W. R. White & Co., Elizabeth City, N. C.	Manufacturer	Feb. 23, '10	100
3742	do	do	T. P. Nash, Elizabeth City	July 8, '10	100
3577	do	do	do	Feb. 23, '10	100

Seventeen samples of Corn and Oat Feeds were analyzed. Six are below the guarantee in protein; seven are below the guarantee in fat, and one is above the guarantee in fiber.

RYE FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3793	14.00	3.00	6.00	60.00	15.88	3.84	5.52	58.22	11.45	5.09	Rye middlings.
3790	14.50	1.50	5.20	63.10	16.50	3.30	4.28	62.67	9.34	3.91	do.
3647	14.50	1.50	5.20	63.10	16.50	3.39	4.13	62.00	9.98	3.98	do.
3576	14.00	3.00	6.00	55.00	14.63	3.30	4.85	63.23	9.33	4.66	Rye product.
3575	14.00	3.00	6.00	55.00	16.38	3.82	5.87	59.23	8.96	5.74	do.

AND OAT FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3777	8.00	3.50	11.00	60.00	9.00	3.47	8.71	64.52	9.64	4.66	Cracked corn and oat feed.
3776	8.00	3.50	11.00	60.00	10.63	3.90	7.82	63.16	9.91	4.58	do.
3582	8.50	3.50	11.50	60.00	8.25	2.95	9.45	66.54	7.97	4.84	Corn and oat products.
3525	-----	-----	-----	-----	18.75	3.31	24.03	41.98	6.42	5.51	Oat and corn products.
3710	9.38	3.37	-----	-----	8.88	2.40	5.78	67.20	11.59	4.15	Corn and oat product.
3704	-----	-----	-----	-----	9.25	3.74	3.26	70.03	11.63	2.09	do.
3670	-----	-----	-----	-----	9.50	4.23	4.32	69.10	10.60	2.25	Cracked corn and whole oats.
3646	10.00	4.00	9.00	62.00	11.25	4.82	10.02	60.63	8.90	4.38	Oat products including oat hulls, wheat products, corn products and small amount cotton seed meal.
3524	-----	-----	-----	-----	19.63	3.60	24.02	40.10	7.12	5.53	Oat products.
3515	-----	-----	-----	-----	9.88	5.15	4.59	67.68	10.11	2.59	Ground corn and oats.
3696	-----	-----	-----	-----	8.50	3.80	7.29	67.18	10.90	2.33	do.
3754	9.75	5.00	5.00	70.00	10.88	4.46	3.37	67.22	11.72	2.35	Cracked corn and oats.
3613	-----	-----	-----	-----	8.38	5.05	4.71	68.89	10.64	2.33	do.
3758	9.00	4.00	8.00	70.00	8.88	4.22	3.54	69.42	11.74	2.20	do.
3580	11.44	4.92	8.82	-----	8.88	3.94	2.72	72.86	9.67	1.93	do.
3742	11.44	4.92	8.82	-----	10.00	4.21	3.64	68.30	11.58	2.27	do.
3577	11.44	4.92	8.82	-----	8.75	4.10	2.84	73.23	9.04	2.04	do.

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3375	High Grade Carolina Rice Meal.	Carolina Rice Mills, Goldsboro, N. C.	Len H. Adams, Raleigh	Dec. 1, '09	100
3600	do	do	do	Mar. 8, '10	100
3623	do	do	Tomlinson & Co., Wilson	Mar. 17, '10	100
3750	do	do	Best & Sons, Goldsboro	July 14, '10	100
3711	Rice Polish	do	Wilson Grocery Co., Wilson	July 5, '10	100
3732	Rice Meal	do	Roberson Ruffin Co., Tarboro.	July 6, '10	75
3753	do	do	W. C. Moye & Sons, Goldsboro.	July 14, '10	100
3715	Carolina Rice Meal	West Point Mill Co., Charleston, S. C.	C. A. Woodard, Wilson	July 5, '10	200
3449	do	do			
3785	Rice Bran	H. da Ponte & Co., New Orleans, La.			
3786	Rice Polish	do			
3787	Rice Shorts	do			
3788	Rice Flour	do			

Thirteen samples of Rice Feeds were analyzed. Four are below the guarantee in protein; six are below the guarantee in fat, and seven are above the guarantee in fiber.

ANALYSES OF MOLASSES

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3782	Seocoates	Southern Cotton Oil Co., Charlotte, N. C.	Adams Grain and Provision Co., Fayetteville.	July 20, '10	100
3402	Molasses Feed	do			
3736	XXX Dairy Feed	Milwaukee Grain and Feed Co., Milwaukee, Wis.	F. V. Johnston, Greenville	July 6, '10	100
3764	do	do	Burrus & Co., New Bern	July 15, '10	100
3378	Sugarine Dairy Feed	The Sugarine Co., Chicago, Ill.	F. B. Phillips, Raleigh	Dec. 1, '09	100
3601	do	do	do	Mar. 8, '10	100
3651	Badger Dairy Feed	Chas. A. Krause Milling Co., Milwaukee, Wis.	E. N. Rhodes & Co., Hamlet	Mar. 21, '10	100
3722	Badger Alfalfa Horse and Mule Feed.	do	Matthews, Weeks & Co., Rocky Mount.	July 5, '10	100
3369	Sucrene Dairy Feed	American Milling Co., Chicago, Ill.	Job P. Wyatt & Sons, Raleigh.	Dec. 1, '09	100
3418	do	do	J. H. Culbreth & Co., Fayetteville.	Jan. 13, '10	100
3460	do	do	Adams Grain and Provision Co., Charlotte.	Jan. 21, '10	100

RICE FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25)	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3375	12.25	13.25	7.75	60.00	11.38	12.81	10.51	47.18	9.43	8.69	Rice product.
3600	12.25	13.25	7.75	60.00	12.13	11.87	8.63	50.99	7.32	9.06	do.
3623	12.25	13.25	7.75	60.00	10.75	11.01	12.32	46.16	9.21	10.52	do.
3750	12.25	13.25	7.75	60.00	13.00	13.00	8.45	46.10	10.66	8.79	do.
3711	11.50	7.00	6.30	60.00	9.63	5.76	0.80	68.81	12.90	2.10	Rice polish.
3732	12.00	9.00	8.00	60.00	13.63	14.18	8.50	43.50	10.46	9.73	Rice product.
3753	12.00	9.00	8.00	60.00	12.63	12.05	9.88	44.03	10.71	10.70	do.
3715	10.00	11.00	10.00	55.00	10.25	10.15	10.02	49.07	10.82	9.69	do.
3449	.....	.....	.....	.....	9.50	11.55	10.48	49.51	8.53	10.43	do.
3785	.....	.....	.....	.....	13.38	12.92	7.68	48.81	9.24	7.97	do.
3786	.....	.....	.....	.....	12.13	15.50	6.94	51.44	8.82	5.17	do.
3787	.....	.....	.....	.....	12.63	10.98	6.17	51.55	11.61	7.06	do.
3788	.....	.....	.....	.....	9.75	8.01	11.52	52.53	8.71	9.48	do.

OR SUGAR FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3782	12.00	3.50	12.00	50.00	12.50	5.91	9.06	57.08	10.78	4.67	Cracked corn, rice product, cotton-seed meal, ground pea vine, hay and molasses.
3402	.....	.....	.....	.....	12.25	5.11	13.59	54.99	9.49	4.57	do.
3736	15.00	2.00	10.00	50.00	20.25	4.93	10.57	44.42	14.10	5.73	Brewer's grains, malt sprouts, cotton-seed meal and molasses.
3764	15.00	2.50	10.00	50.00	26.25	4.89	9.83	39.91	12.47	6.65	do.
3378	16.50	3.50	12.00	46.00	18.13	6.77	12.18	45.16	8.60	9.16	Screenings, oat hulls, cotton-seed meal, weed seed and molasses.
3601	16.50	3.50	12.00	46.00	18.13	5.16	11.89	48.58	8.11	8.13	Screenings containing weed seed, cotton-seed meal malt sprouts and molasses.
3651	16.00	3.50	10.00	.....	18.88	3.93	10.39	49.02	8.86	8.92	Screenings, malt sprouts, cotton-seed meal, wheat middlings and molasses.
3722	10.00	2.50	12.00	.....	11.50	3.86	8.91	53.47	15.52	6.74	Alfalfa meal, cracked corn, oat products, and molasses.
3369	16.50	3.50	12.00	46.00	18.13	5.48	11.43	48.97	7.80	8.19	Screenings, wheat middlings, cotton-seed meal weed seed and molasses.
3418	16.50	3.50	12.00	46.00	17.25	5.03	11.85	48.45	9.26	8.16	Screenings, dried brewer's grains, cotton-seed meal few weed seed and molasses.
3460	16.50	3.50	12.00	46.00	16.63	5.14	10.37	51.27	8.14	8.45	do.

ANALYSES OF MOLASSES

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3559	Suerene Dairy Feed	American Milling Co., Chicago, Ill.	Elmore Maxwell Co., Greensboro.	Feb. 21, '10	100
3568	do	do	C. B. Hill, New Bern	Feb. 26, '10	100
3749	Suerene Horse and Mule Feed.	do	B. G. Thompson, Goldsboro.	July 14, '10	100
3372	do	do	Job P. Wyatt & Sons, Raleigh	Dec. 1, '09	100
3778	Daisy Dairy Feed	Great Western Cereal Co., Chicago, Ill.	O. H. Wright & Co., Wilmington.	July 18, '10	100
3677	Molasses Grains	E. P. Mueller, Norfolk, Va.	City Feed Co., Hickory	April 27, '10	100
3360	do	do	N. W. Propst, Hickory	Nov. 6, '09	100
3474	do	do		Jan. 27, '10	
3507	do	do	F. J. Ramsour, Lincolnton	Feb. 8, '10	
3531	do	do	Piedmont Feed Co., Wilkesboro.	Feb. 15 '10	125
3532	do	do	do	Feb. 15, '10	125
3573	Suerene Dairy Feed	American Milling Co., Chicago, Ill.	C. L. Spencer, New Bern	Feb. 26, '10	100

Twenty-three samples of Molasses or Sugar Feeds were analyzed. Six are below the guarantee in protein; seven are below the guarantee in fat, and eight are above the guarantee in fiber.

On the whole, this class of feeds shows a marked improvement over the product found on the markets during previous years. Fewer weed seeds were found

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3415	Corno Horse and Mule Feed.	The Corno Mills Co., St. Louis, Mo.	J. W. Carter, Maxton	Jan. 14, '17	175
3426	do	do	McLaurin & Shaw, Laurinburg.	Jan. 14, '10	100
3447	do	do	Davidson & Wolff, Charlotte	Jan. 19, '10	
3499	do	do	Asheville Hay and Grain Co., Asheville.	Feb. 4, '10	100
3510	do	do	Wampum Store, Lincolnton	Feb. 8, '10	100
3626	do	do	W. C. Moye & Son, Goldsboro.	Mar. 9, '10	100
3637	do	do	McLaurin & Shaw, Laurinburg.	Mar. 19, '10	100
3761	Cremo Dairy Feed	do	New Bern Fruit Co., New Bern.	July 15, '10	100
3422	Alfacorn Feed	Capital Gratn and Mill Co., Nashville, Tenn.	Adams Grain and Provision Co., Fayetteville.	Jan. 13, '10	100
3795	Maizefalfa Feed	Great Western Cereal Co., Chicago, Ill.	Patterson Co., Greensboro	July 25, '10	100

OR SUGAR FEEDS—CONTINUED.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients
3559	16.50	3.50	12.00	46.00	17.88	5.74	10.83	47.62	8.11	9.82	Wheat screenings, oat hulls, wheat middlings, cotton-seed meal, corn meal, malt sprouts and molasses.
3568	16.50	3.50	12.00	42.00	16.75	4.39	11.69	48.88	8.32	9.97	do.
3749	10.00	3.50	12.00	50.00	9.75	2.81	8.51	60.63	12.35	5.95	Cracked corn, corn meal, barley, screenings and molasses.
3372	10.00	3.50	12.00	50.00	10.00	3.91	8.19	63.25	8.39	6.26	Screenings, cracked corn, few weed seed and molasses.
3778	15.00	3.00	12.00	50.00	15.13	3.39	13.53	49.54	10.95	7.46	Screenings, cotton-seed meal, oat hulls and molasses.
3677	10.00	3.00	12.00	48.00	8.00	0.11	11.16	66.10	7.78	6.85	Malt sprouts, small amount brewer's grains, ground corn cobs, ground rice hulls and molasses.
3360	10.00	3.25	12.00	48.00	5.63	0.82	18.12	59.97	6.58	8.88	Mill screenings, rice hulls and molasses.
3474	10.00	3.25	12.00	48.00	9.50	1.61	8.61	64.23	5.99	10.06	Wheat bran, ground rice hulls and molasses.
3507	10.00	3.25	12.00	48.00	8.00	1.70	14.11	57.49	7.79	10.91	Screenings, ground hay, rice hulls and molasses.
3531	10.00	3.25	12.00	48.00	3.88	0.80	13.68	69.93	5.15	6.56	Ground corn cobs, small amount screenings and molasses.
3532	1.00	1.00	25.00	.....	3.75	0.84	14.69	67.30	7.14	6.28	do.
3573	16.50	3.50	12.00	46.00	17.25	4.89	12.11	47.60	8.33	9.82	Wheat screenings, oat hulls, wheat middlings, cotton-seed meal, corn meal, malt sprouts and molasses.

in the samples, and in general a higher class of ingredients have been used in making these feeds.

Molasses grains, manufactured by E. P. Mueller, of Norfolk, Va., are still low-grade, adulterated products.

ALFALFA FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3415	10.00	4.00	12.00	.....	10.75	4.42	8.80	62.77	9.31	3.95	Alfalfa meal, cracked corn and oat products.
3426	10.00	3.50	12.00	38.05	10.75	3.76	12.62	59.50	8.62	4.75	do.
3447	10.00	3.50	12.00	56.00	10.38	3.66	10.61	61.24	9.91	4.20	do.
3499	10.00	3.50	12.00	58.50	10.88	3.22	14.18	57.97	8.46	5.29	do.
3510	10.00	3.50	12.00	58.00	10.50	3.94	11.70	61.58	7.75	4.53	do.
3626	10.00	3.50	12.00	58.50	10.00	3.35	11.75	60.63	10.06	4.21	do.
3637	10.00	3.50	12.00	58.50	10.00	3.75	9.47	64.27	8.95	3.56	do.
3761	14.50	5.00	19.50	45.00	17.63	4.25	18.30	41.81	11.31	6.70	Alfalfa meal, cotton-seed meal, ground corn and oat products.
3422	12.50	3.50	12.50	54.00	11.38	3.09	12.03	60.46	8.31	4.73	Alfalfa meal, cracked corn and oats.
3795	10.00	4.00	11.00	.....	11.88	4.48	8.13	60.36	10.42	4.73	Alfalfa meal, cracked corn and oat products.

ANALYSES OF ALFALFA

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3689	Alfalfa Meal	Albert Dickinson Co., Chicago, Ill.	Job P. Wyatt & Sons, Raleigh	May 19, '10	100
3660	Evergreen Feed	Alfalfa Feed Mills, Nashville, Tenn.	Chas. Moody Co., Charlotte	Mar. 25, '10	100
3769	Purina Feed	Ralston Purina Co., St. Louis, Mo.	Burrus & Gray Co., New Bern.	July 15, '10	100
3570	...do	...do	...do	Feb. 26, '10	100
3554	...do	...do	W. H. Turner, Winston	Feb. 18, '10	100
3475	...do	...do	Chas. Moody Co., Charlotte		
3454	...do	...do	...do	Jan. 21, '10	100
3832	Alfalfa Meal	Carolina Rice Mills, Goldsboro, N. C.			
3833	Alfalfa and Rice Feed "A"	...do			
3834	Alfalfa and Rice Feed "B"	...do			
3686	Sucrene Alfalfa Horse and Mule Feed.	American Milling Co., Chicago, Ill.	Job P. Wyatt & Sons, Raleigh,	May 19, '10	100
3631	...do	...do	C. Woodard Co., Wilson	Mar. 17, '10	100
3574	...do	...do	C. L. Spencer, New Bern	Feb. 26, '10	100
3495	Kornfalfa Feed	Kornfalfa Feed Milling Co., Kansas City, Mo.	Asheville Milling Co., Asheville.	Feb. 3, '10	100
3545	...do	...do	Cramer Bros., Winston	Feb. 17, '10	100
3633	...do	...do	Wells Grocery Co., Wilson	Mar. 17, '10	100
3585	Pioneer Alfalfa Meal	...do	John S. McEachern & Sons, Wilmington.	Mar. 5, '10	100

Twenty-seven samples of Alfalfa Feeds were analyzed. Nine are below the guarantee in protein; eleven are below the guarantee in fat, and nine are above the guarantee in fiber.

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3627	Dried Beet Pulp	Larrowe Milling Co., Detroit, Mich.	W. C. Moye & Son, Goldsboro.	Mar. 9, '10	100
3389	...do	...do	Hunter & Dunn, Raleigh	Dec. 1, '09	100
3379	...do	...do	F. B. Phillips, Raleigh	Dec. 1, '09	100

Three samples of Beet Pulp were analyzed. All came up to the guarantee.

FEEDS—CONTINUED.

	Guarantee.				Analysis.						
Laboratory Number.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25)	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3689	12.00	1.00	30.00	35.00	13.75	1.89	32.31	31.31	11.18	9.56	Alfalfa meal.
3660	10.00	3.00	11.50	.....	13.50	2.88	12.31	57.43	8.77	5.11	Alfalfa meal, cracked corn and oats.
3769	12.50	4.00	8.90	58.00	11.75	4.20	7.63	62.52	10.25	3.65	Alfalfa meal, cracked corn, oats and dried brewer's grains.
3570	12.50	4.00	8.90	58.00	12.13	4.52	8.12	62.79	8.49	3.95	do.
3551	12.50	4.00	9.90	58.00	12.13	4.12	9.11	62.58	7.85	4.21	Alfalfa meal, cracked corn and oats.
3475	.....	.....	.....	.....	11.75	4.26	8.65	61.46	9.22	4.66	do.
3454	12.50	4.00	9.90	58.00	12.00	4.27	8.40	62.27	8.98	4.08	do.
3832	.....	.....	.....	.....	17.25	2.26	21.52	43.50	7.12	8.35	Alfalfa meal.
3833	.....	.....	.....	.....	12.25	9.92	15.73	45.39	6.05	10.66	Alfalfa meal and rice products.
3834	.....	.....	.....	.....	13.00	9.53	16.51	46.48	5.66	8.82	do.
3686	10.00	3.50	12.00	50.00	12.59	2.68	12.41	54.36	12.20	5.85	Alfalfa meal, wheat product, linseed meal, ground oats, buckwheat and barley.
3631	10.00	3.50	12.00	50.00	11.38	2.83	12.47	58.29	10.07	4.96	do.
3574	10.00	3.50	12.00	50.00	12.38	3.07	12.39	58.16	8.76	5.24	do.
3495	12.00	4.00	10.00	58.00	10.50	3.57	10.48	61.10	10.14	4.21	Alfalfa meal, cracked corn, corn meal and oats.
3545	12.00	4.00	10.00	58.00	11.13	3.64	10.15	61.34	9.17	4.57	do.
3633	12.00	4.00	10.00	58.00	10.13	3.60	9.64	62.35	10.45	3.83	do.
3585	15.00	2.00	22.00	45.00	13.63	2.22	28.59	37.16	8.39	10.01	Alfalfa meal.

DRIED BEET PULP.

	Guarantee.				Analysis.						
Laboratory Number.	Protein (N x 6.25)	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3627	8.00	0.50	20.00	60.00	8.75	0.97	17.53	58.87	10.00	3.88	Beet pulp.
3389	8.00	0.50	20.00	60.00	9.00	0.86	17.94	61.84	6.92	3.44	do.
3379	8.00	0.50	20.00	60.00	8.88	0.86	18.51	62.08	5.98	3.69	do.

ANALYSES OF COTTON-SEED

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3535	Perfecto Feed	Southern Cotton Oil Co., Charlotte, N. C.	Mt. Airy Feed Store, Mt. Airy	Feb. 16, '10	100
3456	....do	....do	W. F. Redman & Co., Charlotte.	Jan. 21, '10	100
3667	Cotton-seed Meal	Elba Manufacturing Co., Charlotte, N. C.	Peeler Grocery and Provision Co., Salisbury.	Mar. 31, '10	100
3666	Cotton-seed Feed	....do	....do	Mar. 31, '10	100
3644	Cotton-seed Meal	Lumberton Cotton Oil Co., Lumberton, N. C.	L. H. Caldwell, Lumberton	Mar. 18, '10	100
3560	Cotton-seed Meal Feed	Pine Level Oil Mill, Pine Level, N. C.			
3491	Star Brand Cotton-seed Meal.	J. Lindsay Wells Co., Memphis, Tenn.	W. R. Ashworth & Son, Brevard.	Jan. 31, '10	100
3478	Cotton-seed Meal	North Carolina Cotton Oil Co., Raleigh, N. C.	Crowder & Rand, Raleigh	Feb. 4, '10	
3477	....do	....do	Job P. Wyatt & Sons, Raleigh.	Feb. 4, '10	
3408	....do	American Cotton Oil Co., Memphis, Tenn.	McKinnie Bros., Louisburg.	Jan. 12, '10	100
3393	....do	Chatham Cotton Oil Co., Pittsboro, N. C.			
3361	....do	John S. McEachern & Sons, Wilmington, N. C.			
3770	Feed Meal	North Carolina Cotton Oil Co., Wilmington, N. C.	John S. McEachern & Sons, Wilmington.	July 18, '10	100
3498	Cotton-seed Feed Meal	Southern Fibre Co., Portsmouth, Va.	Asheville Hay and Grain Co., Asheville.	Feb. 4, '10	100
3558	....do	....do	Patterson Bros., Greensboro	Feb. 21, '10	
3579	....do	....do	Zimmerman & Co.; Elizabeth City.		100
3496	Creamo Brand Cotton-seed Feed Meal.	Tennessee Fibre Co., Memphis, Tenn.	Asheville Grocery Co., Asheville.	Feb. 3, '10	100
3773	....do	....do	The Stone Co., Wilmington	July 18, '10	100
3399	Cotton-seed Meal Feed	Universal Oil and Fertilizer Co., Wilmington, N. C.			
3365	Cotton-seed Feed No. 1	....do			
3366	Cotton-seed Feed No. 2	....do			
3367	Cotton-seed Feed No. 3	....do			
3355	Cotton-seed Meal Feed	....do			
3350	Cotton-seed Cake	....do			

Twenty-nine samples of Cotton-seed Meal Feeds were analyzed. Ten are below the guarantee in protein; twelve are below the guarantee in fat, and nine are above the guarantee in fiber

MEAL FEEDS—CONTINUED.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3535	25.00	5.00	25.00	30.00	26.00	4.75	19.95	37.14	6.90	5.26	Cotton-seed meal and hulls.
3456	25.00	5.00	25.00	30.00	23.75	3.43	21.01	39.62	7.29	4.87	do.
3667	38.50	6.00	10.00	.....	36.63	6.49	11.52	32.12	6.84	6.40	Cotton-seed meal.
3666	10.00	2.50	40.00	70.00	11.75	2.08	36.29	37.86	8.25	3.77	Cotton-seed hulls and meal.
3644	41.00	9.00	10.50	.....	39.13	8.65	8.86	29.85	7.06	6.45	Cotton-seed meal.
3560	.....	.....	.....	.....	33.00	8.22	13.21	30.97	8.40	6.20	Cotton-seed meal, low grade.
3491	41.00	9.00	7.00	25.00	37.63	8.59	9.10	30.25	7.64	6.49	Cotton-seed meal.
3478	.....	.....	.....	.....	33.13	6.13	13.08	31.05	7.40	6.21	Cotton-seed meal, low grade.
3477	.....	.....	.....	.....	36.00	6.43	10.75	33.29	7.03	6.50	do.
3408	.....	9.00	10.50	.....	36.50	7.90	10.62	32.24	6.01	6.73	do.
3393	.....	.....	.....	.....	37.88	7.22	11.41	30.79	6.16	6.54	Cotton-seed meal.
3361	.....	.....	.....	.....	33.25	6.38	13.83	34.64	6.75	5.15	Cotton-seed meal, low grade.
3770	36.00	7.00	9.50	40.00	36.13	6.43	10.57	36.09	10.38	6.40	Cotton-seed meal and hulls.
3498	22.00	4.00	22.00	52.00	19.25	3.98	25.01	41.64	7.40	4.69	do.
3558	22.00	4.00	22.00	52.00	21.38	4.29	22.07	40.20	7.19	4.87	do.
3579	22.00	4.00	22.00	52.00	14.25	3.02	27.14	43.51	8.05	4.03	do.
3496	20.00	4.00	22.00	38.00	19.25	4.51	23.38	40.32	8.15	4.39	do.
3773	20.00	4.00	22.00	38.00	25.50	5.18	17.49	35.88	10.81	5.14	do.
3399	.....	.....	.....	.....	26.63	10.24	16.17	34.68	7.36	4.92	do.
3365	.....	.....	.....	.....	7.38	3.37	40.27	38.51	7.48	2.99	Cotton-seed hulls and meal.
3366	.....	.....	.....	.....	8.63	5.02	39.55	36.40	7.21	3.19	do.
3367	.....	.....	.....	.....	16.50	9.58	27.77	35.52	6.91	3.72	do.
3355	.....	.....	.....	.....	29.37	13.36	14.10	32.29	5.32	5.56	do.
3350	.....	.....	.....	.....	21.88	14.16	16.33	36.38	6.33	4.92	Cotton-seed cake.

ANALYSES OF COTTON-SEED

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3535	Perfecto Feed	Southern Cotton Oil Co., Charlotte, N. C.	Mt. Airy Feed Store, Mt. Airy	Feb. 16, '10	100
3456	....do	....do	W. F. Redman & Co., Charlotte.	Jan. 21, '10	100
3667	Cotton-seed Meal	Elba Manufacturing Co., Charlotte, N. C.	Peeler Grocery and Provision Co., Salisbury.	Mar. 31, '10	100
3666	Cotton-seed Feed	....do	....do	Mar. 31, '10	100
3644	Cotton-seed Meal	Lumberton Cotton Oil Co., Lumberton, N. C.	L. H. Caldwell, Lumberton	Mar. 18, '10	100
3560	Cotton-seed Meal Feed	Pine Level Oil Mill, Pine Level, N. C.			
3491	Star Brand Cotton-seed Meal.	J. Lindsay Wells Co., Memphis, Tenn.	W. R. Ashworth & Son, Brevard.	Jan. 31, '10	100
3478	Cotton-seed Meal	North Carolina Cotton Oil Co., Raleigh, N. C.	Crowder & Rand, Raleigh	Feb. 4, '10	
3477	....do	....do	Job P. Wyatt & Sons, Raleigh.	Feb. 4, '10	
3408	....do	American Cotton Oil Co., Memphis, Tenn.	McKinnie Bros., Louisburg.	Jan. 12, '10	100
3393	....do	Chatham Cotton Oil Co., Pittsboro, N. C.			
3361	....do	John S. McEachern & Sons, Wilmington, N. C.			
3770	Feed Meal	North Carolina Cotton Oil Co., Wilmington, N. C.	John S. McEachern & Sons, Wilmington.	July 18, '10	100
3498	Cotton-seed Feed Meal	Southern Fibre Co., Portsmouth, Va.	Asheville Hay and Grain Co., Asheville.	Feb. 4, '10	100
3558	....do	....do	Patterson Bros., Greensboro	Feb. 21, '10	
3579	....do	....do	Zimmerman & Co.; Elizabeth City.		100
3496	Creamo Brand Cotton-seed Feed Meal.	Tennessee Fibre Co., Memphis, Tenn.	Asheville Grocery Co., Asheville.	Feb. 3, '10	100
3773	....do	....do	The Stone Co., Wilmington	July 18, '10	100
3399	Cotton-seed Meal Feed	Universal Oil and Fertilizer Co., Wilmington, N. C.			
3365	Cotton-seed Feed No. 1	....do			
3366	Cotton-seed Feed No. 2	....do			
3367	Cotton-seed Feed No. 3	....do			
3355	Cotton-seed Meal Feed	....do			
3350	Cotton-seed Cake	....do			

Twenty-nine samples of Cotton-seed Meal Feeds were analyzed. Ten are below the guarantee in protein; twelve are below the guarantee in fat, and nine are above the guarantee in fiber

MEAL FEEDS—CONTINUED.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbo-hydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3535	25.00	5.09	25.00	30.00	26.00	4.75	19.95	37.14	6.90	5.26	Cotton-seed meal and hulls.
3456	25.00	5.00	25.00	30.00	23.75	3.43	21.04	39.62	7.29	4.87	do.
3667	38.50	6.00	10.00	.....	36.63	6.49	11.52	32.12	6.84	6.40	Cotton-seed meal.
3666	10.00	2.50	40.00	70.00	11.75	2.08	36.29	37.86	8.25	3.77	Cotton-seed hulls and meal.
3644	41.00	9.00	10.50	.....	39.13	8.65	8.86	29.85	7.06	6.45	Cotton-seed meal.
3560	.....	.....	.....	.....	33.00	8.22	13.21	30.97	8.40	6.20	Cotton-seed meal, low grade.
3491	41.00	9.00	7.00	25.00	37.63	8.59	9.10	30.25	7.64	6.49	Cotton-seed meal.
3478	.....	.....	.....	.....	33.13	6.13	13.08	34.05	7.40	6.21	Cotton-seed meal, low grade.
3477	.....	.....	.....	.....	36.00	6.43	10.75	33.29	7.03	6.50	do.
3408	.....	9.00	10.50	.....	36.50	7.90	10.62	32.24	6.01	6.73	do.
3393	.....	.....	.....	.....	37.88	7.22	11.41	30.79	6.16	6.54	Cotton-seed meal.
3361	.....	.....	.....	.....	33.25	6.38	13.83	34.64	6.75	5.15	Cotton-seed meal, low grade.
3770	36.00	7.00	9.50	40.00	36.13	6.43	10.57	30.09	10.38	6.40	Cotton-seed meal and hulls.
3498	22.00	4.00	22.00	52.00	19.25	3.98	25.04	41.64	7.40	4.69	do.
3558	22.00	4.00	22.00	52.00	21.38	4.29	22.07	40.20	7.10	4.87	do.
3579	22.00	4.00	22.00	52.00	14.25	3.02	27.14	43.51	8.05	4.03	do.
3496	20.00	4.00	22.00	38.00	19.25	4.51	23.38	40.32	8.15	4.39	do.
3773	20.00	4.00	22.00	38.00	25.50	5.18	17.40	35.88	10.81	5.14	do.
3399	.....	.....	.....	.....	26.63	10.24	16.17	34.68	7.36	4.92	do.
3365	.....	.....	.....	.....	7.38	3.37	40.27	38.51	7.48	2.99	Cotton-seed hulls and meal.
3366	.....	.....	.....	.....	8.63	5.02	39.55	36.40	7.21	3.19	do.
3367	.....	.....	.....	.....	16.50	9.58	27.77	35.52	6.91	3.72	do.
3355	.....	.....	.....	.....	29.37	13.36	14.10	32.29	5.32	5.56	do.
3350	.....	.....	.....	.....	21.88	14.16	16.33	36.38	6.33	4.92	Cotton-seed cake.

ANALYSES OF PEANUT

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3591	Peanut Meal	Universal Oil and Fertilizer Co., Wilmington, N. C.	Manufacturer	Mar. 5, '10	100
3684	Spanish Peanut Hulls	do			
3675	Peanut Hulls	do	Manufacturer		

One sample of Peanut Meal was analyzed. This is below the guarantee in protein.

ANALYSIS OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3629	Buffalo Gluten Feed	Corn Products Refining Co., New York, N. Y.	W. C. Moye & Son, Goldsboro.	Mar. 9, '10	100

One sample of Gluten Feed was analyzed. This comes up to the guarantee.

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs
3562	Cracked Corn	S. D. Scott & Co., Norfolk, Va.	Burrus & Gray Co., New Bern.	Feb. 26, '10	100
3563	do	do	F. G. Paul & Bro., Washington.	Feb. 26, '10	100
3564	do	do	H. C. Privott, Edenton	Feb. 24, '10	100
3572	do	do	Armstrong Grocery Co., New Bern.	Feb. 26, '10	100
3583	do	do	Brown, Toon & Co., Wilmington.	Mar. 3, '10	100
3618	do	do	H. C. Edwards, Kinston	Mar. ..., '10	100
3680	do	do	E. R. Mixon & Co., Washington.	April 12, '10	100
3578	do	W. R. White & Co., Elizabeth City N. C.	Manufacturer	Feb. 23, '10	100
3744	do	do	T. P. Nash, Elizabeth City	July 8, '10	100
3771	do	John S. McEachern & Sons, Wilmington, N. C.	Manufacturer	July 18, '10	75

MEAL AND HULLS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Guarantee. Fat (Ether Extract).	Guarantee. Fiber.	Guarantee. Carbohydrates.	Analysis. Protein (N x 6.25).	Analysis. Fat (Ether Extract).	Analysis. Fiber.	Analysis. Nitrogen-free Extract.	Analysis. Moisture.	Analysis. Ash.	Microscopic Examination Shows the Following Ingredients.
3591	32.00	10.00	22.00	26.00	25.50	12.99	21.69	27.35	6.88	5.59	Ground peanut cake.
3684	-----	-----	-----	-----	9.00	2.80	29.87	27.45	6.78	24.10	Ground peanut hulls.
3675	-----	-----	-----	-----	10.12	2.70	31.33	29.98	5.89	19.98	do.

GLUTEN FEED.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Guarantee. Fat (Ether Extract).	Guarantee. Fiber.	Guarantee. Carbohydrates.	Analysis. Protein (N x 6.25).	Analysis. Fat (Ether Extract).	Analysis. Fiber.	Analysis. Nitrogen-free Extract.	Analysis. Moisture	Analysis. Ash.	Microscopic Examination Shows the Following Ingredients.
3629	27.00	2.50	8.50	-----	29.00	3.32	6.37	46.70	8.54	6.07	Gluten feed.

CRACKED CORN.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Guarantee. Fat (Ether Extract).	Guarantee. Fiber.	Guarantee. Carbohydrates.	Analysis. Protein (N x 6.25).	Analysis. Fat (Ether Extract).	Analysis. Fiber.	Analysis. Nitrogen-free Extract.	Analysis. Moisture.	Analysis. Ash.	Microscopic Examination Shows the Following Ingredients.
3562	9.00	4.00	4.00	-----	8.63	4.60	2.12	73.88	9.10	1.67	Cracked corn.
3563	9.00	4.00	4.00	-----	8.63	3.64	1.85	74.56	9.80	1.52	do.
3564	9.00	4.00	4.00	-----	8.50	4.10	2.03	74.39	9.31	1.67	do.
3572	9.00	4.00	4.00	-----	9.38	4.49	2.14	73.57	8.79	1.63	do.
3583	9.00	4.00	4.00	-----	8.63	3.31	1.60	74.70	9.97	1.79	do.
3618	9.00	4.00	4.00	-----	9.38	4.79	2.14	71.68	10.11	1.90	do.
3680	9.00	4.00	4.00	-----	8.75	3.72	1.96	75.32	8.77	1.48	do.
3578	10.00	4.00	4.00	-----	8.75	4.16	2.18	74.65	8.65	1.61	do.
3744	10.00	4.00	4.00	-----	9.13	4.30	1.55	72.35	10.87	1.80	do.
3771	10.30	5.05	2.30	70.40	9.38	3.88	1.69	66.73	11.68	6.64	do.

ANALYSES OF CRACKED

Laboratory Number.	Brand Name from Label	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3566	Cracked Corn	Virginia Milling Co., Suffolk, Va.	J. A. Woodard & Co., Edenton.	Feb. 24, '10	100
3567	do	do	J. R. Bell, Morehead City	Feb. 28, '10	100
3619	do	Virginia Mills, Suffolk, Va.	H. C. Edwards, Kinston	Mar. 11, '10	100
3757	do	do	do	July 14, '10	100
3586	do	Boney & Harper Milling Co., Wilmington, N.C.	D. L. Gail & Co., Wilmington	Mar. 3, '10	100
3593	do	do	J. W. Brooks, Wilmington	Mar. 5, '10	75
3765	do	do	Armstrong Grocery Co., New Bern.	July 15, '10	100
3762	do	Washington Milling Co., Washington C. H., Ohio.	New Bern Fruit Co., New Bern.	July 15, '10	100
3738	do	Dabney Brokerage Co., Norfolk, Va.	E. Peterson & Co., Washington.	July 7, '10	100
3734	do	J. M. Gwaltney & Co., Norfolk, Va.	C. L. Starkley, Greenville	July 6, '10	100
3730	do	J. W. Pool & Son, Petersburg, Va.	Geo. J. Hales & Co., Rocky Mount.	July 5, '10	100
3681	do	Lynchburg Milling Co., Lynchburg, Va.	E. Peterson & Co., Washington.	April 12, '10	100
3678	do	The Ohio Cereal Co., Circleville, Ohio.	J. T. Ginn & Co., Goldsboro	May 4, '10	
3674	do	Hooker, Churchill & Co., Kinston, N. C.			
3617	do	do	Manufacturer	Mar. 11, '10	100
3581	do	City Hay and Grain Co., Norfolk, Va.	E. R. Mixon & Co., Washington.	Feb. 25, '10	100
3571	do	H. F. Munt, Petersburg, Va.	C. L. Spencer, New Bern	Feb. 26, '10	100
3561	do	Jonathan Havens, Washington, N. C.	E. Peterson & Co., Washington	Feb. 25, '10	100
3620	do	Neuse Milling Co., Kinston, N. C.	Manufacturer	Mar. 11, '10	100
3760	do	do	do	July 14, '10	100

Thirty samples of Cracked Corn were analyzed. Nineteen are below the guarantee in protein; sixteen are below the guarantee in fat, and two are

ANALYSES OF SPE

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3824	Boss Feed	Asheville Milling Co., Asheville, N. C.	Manufacturer	Aug. 9, '10	100
3789	do	do	Elmore-Maxwell Co., Greensboro.	July 25, '10	75
3488	do	do	D. S. Pace, Hendersonville	Jan. 29, '10	75
3469	do	do	F. D. Barkley & Co., Gastonia.	Jan. 25, '10	75
3395	do	do			

CORN—CONTINUED.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3566	10.00	4.00	4.00	-----	8.50	3.74	1.82	75.64	8.74	1.56	Cracked Corn.
3567	10.00	4.00	4.00	-----	8.88	3.93	2.21	73.84	9.51	1.63	do.
3619	8.00	4.00	6.00	-----	8.50	3.73	1.67	73.59	11.04	1.47	do.
3757	10.00	4.00	4.00	-----	9.13	2.82	1.15	72.41	12.91	1.58	do.
3586	9.00	5.00	2.00	-----	8.75	5.02	1.99	72.42	9.90	1.92	do.
3593	9.00	5.00	2.00	-----	8.75	4.28	2.28	73.31	9.65	1.73	do.
3765	9.00	3.00	2.00	-----	9.38	4.07	2.10	71.30	11.39	1.76	do.
3762	8.97	4.15	3.00	60.00	9.25	3.83	1.95	72.40	10.64	1.93	do.
3738	8.00	3.00	4.00	65.00	8.75	3.81	2.18	70.46	10.85	3.95	do.
3734	9.00	4.00	4.00	-----	8.75	3.57	1.97	72.84	11.27	1.60	do.
3730	10.00	4.00	3.00	-----	8.38	3.55	1.76	73.32	11.50	1.49	do.
3681	10.00	4.00	4.00	-----	8.63	3.29	1.80	75.51	9.18	1.59	do.
3678	-----	-----	-----	-----	9.25	5 12	2.68	72.01	9.08	1.86	Cracked corn and some cob.
3674	-----	-----	-----	-----	8.38	3.73	1.61	73.38	11.31	1.59	Cracked corn.
3617	8.00	3.00	8.00	-----	7.75	3.88	1.68	73.48	11.66	1.55	do.
3581	9.00	4.00	4.00	-----	8.88	3.48	1.63	74.71	9.53	1.77	Cracked corn containing damaged corn.
3571	10.00	4.30	3.00	65.00	9.00	4.08	1.87	74.16	9.10	1.79	Cracked corn.
3561	8.00	3.00	3.00	-----	8.63	4.33	2.68	73.07	9.86	1.43	do.
3620	8.00	4.00	6.00	-----	9.25	4.58	2.92	70.75	10.25	2.25	Cracked corn and some oats.
3760	8.00	4.00	6.00	-----	9.13	3.37	1.97	69.82	12.65	3.06	Cracked corn.

above the guarantee in fiber. Two of these samples contain a considerable amount of cob, and one contains damaged corn.

CIAL MIXED FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Analysis. Protein (N x 6.25)	Fat (Ether Extract)	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients.
3824	14.00	3.00	7.00	65.00	14.25	4.08	5.98	60.29	11.10	4.30	Wheat and corn products.
3789	14.00	3.00	7.00	65.00	13.88	3.75	5.93	62.19	9.87	4.38	do.
3488	13.00	3.00	9.50	-----	14.88	4.28	7.97	58.48	8.74	5.65	Wheat and corn products, corn bran.
3469	13.00	3.00	9.50	-----	14.50	3.63	5.69	62.22	9.10	4.86	Wheat and corn product.
3395	-----	-----	-----	-----	15.25	4.32	6.12	59.43	9.61	5.27	do.

ANALYSES OF SPECIAL

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3825	White Feed	Asheville Milling Co., Asheville, N. C.	Manufacturer	Aug. 9, '10	75
3396	---do	---do			
3451	Acme Feed	Acme Milling Co., Talbot, Tenn.	W. J. Fite, Charlotte	Jan. 21, '10	75
3462	---do	---do	O. M. Boyd & Co., Gastonia	Jan. 25, '10	
3470	---do	---do	F. D. Barkley & Co., Gastonia.	Jan. 25, '10	75
3487	---do	---do	D. S. Pace, Hendersonville	Jan. 29, '10	75
3492	---do	---do	C. C. Young, Brevard	Jan. 3, '10	75
3794	Model Mill Feed	Model Mill Co., Johnson City, Tenn.	Patterson Co., Greensboro	July 25, '10	100
3813	---do	---do	City Feed Store, Hickory	Aug. 6, '10	100
3797	Rich Middlings	---do	Patterson Co., Greensboro	July 25, '10	100
3417	Peerless Feed	J. Allen Smith & Co., Knoxville, Tenn.	J. H. Culbreth & Co., Fayetteville.	Jan. 13, '10	100
3512	---do	---do	J. P. Mills Co., Mooresville	Feb. 9, '10	100
3604	---do	---do	Dickey & Davis Bros., Murphy.	Feb. 5, '10	100
3549	Red Ribbon Mill Feed	Rives-Rucker Grocery Co., Martinsville, Va.	P. R. Lambe & Co., Winston	Feb. 17, '10	100
3606	Standard Feed	Madisonville Flour Mills, Madisonville, Tenn.	Dickey & Davis Bros., Murphy.	Feb. 5, '10	75
3652	Meals for Meals	Mayo Milling Co., Richmond, Va	Lackey Bros., Hamlet	Mar. 21, '10	100
3687	Wyatt's Special Cow Feed	Job P. Wyatt & Sons, Raleigh, N. C.	Manufacturer	May 19, '10	100
3691	Stock Meal	Manchester Mills, Manchester, Va.	L. H. Adams, Raleigh	May 19, '10	100
3766	Royal Feed	C. L. Spencer, New Bern	Manufacturer	July 15, '10	100
3796	Sterling Stock Feed	Great Western Cereal Co., Chicago, Ill.	Patterson Co., Greensboro	July 25, '10	100
3634	Invincible Feed	Hopkinsville Milling Co., Hopkinsville, Ky.	Irwin-Graham Co., Charlotte		75
3602	Herculean Cow Feed	F. B. Phillips, Raleigh, N. C.	Manufacturer	Mar. 8, '10	100
3476	---do	---do	---do		
3377	---do	---do	---do	Dec. 1, '09	
3565	Sucrene Stock Feed	American Milling Co., Chicago, Ill.	C. L. Spencer, New Bern	Feb. 26, '10	100
3438	Thoroughbred Feed	Lexington Roller Mills Co., Lexington, Ky.	L. C. Bickett & Bro., Monroe.	Jan. 19, '10	100
3435	---do	---do	J. D. Horn, Wadesboro	Jan. 18, '10	100

Thirty-two samples of Special Mixed Feeds were analyzed. Seven are below the guarantee in protein; eight are below the guarantee in fat, and nine are above the guarantee in fiber

MIXED FEEDS—CONTINUED.

Laboratory Number.	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25)	Fat (Ether Extract)	Fiber.	Carbo-hydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3825	13.00	3.00	4.00	70.00	14.13	3.42	1.70	65.88	12.81	2.06	Wheat product.
3396	-----	-----	-----	-----	13.88	3.87	3.22	67.12	9.83	2.58	Wheat and corn product.
3451	12.94	5.07	7.39	69.21	14.00	6.08	7.40	59.07	8.95	4.50	Wheat and corn product, corn bran.
3462	16.00	5.00	7.17	-----	17.13	4.57	7.20	55.20	9.76	6.14	Wheat and corn product.
3470	12.94	5.07	7.39	59.21	15.63	4.65	7.56	57.12	9.47	5.57	Wheat and corn product, corn bran.
3487	16.00	5.00	7.17	-----	14.00	6.51	6.98	59.72	8.09	4.70	do.
3492	16.00	5.00	7.17	-----	14.75	5.74	8.11	57.28	8.92	5.20	do.
3794	14.52	5.10	6.15	55.00	16.88	5.15	6.36	54.91	10.91	5.79	Wheat and corn product.
3818	14.52	5.10	6.15	55.00	16.75	4.89	6.46	56.67	9.53	5.70	do.
3797	15.02	4.40	4.50	67.40	14.75	4.91	6.23	58.10	10.32	5.69	do.
3417	15.00	4.00	7.00	56.00	16.13	4.20	6.17	58.30	10.32	4.88	do.
3512	15.00	4.00	7.00	58.00	16.38	4.22	6.67	58.55	8.78	5.40	Wheat product, corn meal, corn bran.
3604	15.00	4.00	7.00	58.00	16.75	3.87	5.58	59.47	9.69	4.64	Wheat and corn products and corn bran.
3549	11.16	3.60	4.66	67.22	13.13	3.85	8.37	61.06	9.43	4.16	do.
3606	15.40	4.65	3.10	-----	16.75	4.31	5.60	60.25	9.02	4.07	Wheat product.
3652	18.00	4.00	8.00	-----	19.75	5.63	6.31	49.71	9.81	8.79	do.
3687	21.00	3.50	14.00	-----	22.75	5.54	7.54	48.51	10.33	5.33	Wheat bran, cotton-seed meal, corn meal and linseed meal.
3691	8.12	2.74	3.38	-----	7.88	2.36	8.16	67.98	11.51	2.11	Corn product and corn bran.
3766	10.00	6.00	10.44	73.00	10.88	6.17	8.64	61.06	9.98	3.27	Corn product, wheat bran and cotton-seed meal.
3796	10.00	4.00	9.00	65.00	10.50	6.36	8.15	61.47	9.28	4.24	Corn and oat products, cotton-seed meal and wheat product.
3634	15.04	4.30	8.00	60.24	15.75	2.28	6.66	58.58	10.09	6.64	Wheat product.
3602	20.50	4.00	15.00	60.00	19.75	4.68	12.62	47.23	8.58	7.14	Cotton-seed meal, molasses feed, wheat middlings corn meal, beet pulp.
3476	-----	-----	-----	-----	21.13	4.48	14.55	46.03	7.48	6.33	do.
3377	-----	-----	-----	-----	13.75	4.95	6.68	60.11	9.12	5.39	Cotton-seed meal, wheat middlings, cracked corn, molasses feed, beet pulp, oats, small amount salt.
3565	10.00	3.50	13.50	50.00	9.63	3.20	7.82	67.01	9.18	3.16	Cracked corn, ground oats, barley, wheat product, buckwheat and linseed meal.
3438	15.08	3.34	6.56	59.98	16.00	4.08	4.97	60.88	10.12	3.95	Wheat product.
3435	15.08	3.34	6.56	59.98	15.63	4.16	6.31	58.60	9.71	5.59	do.

ANALYSES OF

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3440	Chamberlain's Premium Feed.	W. F. Chamberlain Feed Co., St. Louis, Mo.	Irwin-Graham Co., Charlotte.	Jan. ..., '10	100
3826	Chicken Feed	Asheville Milling Co., Asheville, N. C.	Manufacturer	Aug. 9, '10	----
3640	National Chicken Feed	N. R. Savage & Son, Richmond, Va.	Caldwell & Carlyle, Lumberton.	Mar. 18, '10	100
3811	---do	---do	J. E. Sloop, Statesville	Aug. 5, '10	100
3784	Bolgiano's Chick Food	J. Bolgiano & Son, Baltimore, Md.	Adams Grain and Provision Co., Fayetteville.	July 20, '10	100
3728	Amco Scratch Feed	Amendt Milling Co., Monroe, Mich.	Geo. J. Hales, Rocky Mount	July 5, '10	100
3641	Blue Hen Chick Feed	Statesville Flour Mill Co., Statesville, N.C.	Caldwell & Carlyle, Lumberton.	Mar. 18, '10	50
3708	---do	---do			
3658	Chicken Feed	Carolina Milling Co., Spartanburg, S. C.	McLean Bros., Gastonia	Mar. 29, '10	----
3400	Success Poultry Feed	---do			
3516	Chicken Feed	J. W. Isler & Co., Goldsboro N. C.			
3473	---do	Chas. Moody Co., Charlotte, N. C			
3461	Scratch Food	J. H. Wilkes & Co., Nashville, Tenn.	O. M. Boyd & Co., Gastonia	Jan. 25, '10	100
3450	The Feed-Well Hen Feed	Illinois Feed Mills, St. Louis, Mo.	Kuester-Pharr Co., Charlotte	Jan. 20, '10	100
3448	Good Luck Scratch Feed	Good Luck Mills, St. Louis, Mo.	Piedmont Flour and Grain Co., Charlotte.	Jan. 19, '10	100
3373	Globe Scratch Feed	The Albert Dickenson Co., Chicago, Ill.	Job P. Wyatt & Sons, Raleigh.	Dec. 1, '10	100
3581	---do	---do	John S. McEachern & Sons, Wilmington.	Mar. 5, '10	100
3480	Pine Tree Scratch Feed	---do	Adams Grain and Provision Co., Charlotte.	Jan. 26, '10	100
3712	Crescent Chick Feed	---do	Boykin Grocery Co., Wilson	July 5, '10	100
3725	White Cross Chick Feed	---do	Matthews, Weeks & Co., Rocky Mount.	July 5, '10	100
3431	Poultry Feed	Ralston Purina Co., St. Louis, Mo.	W. T Covington, Rockingham.	Jan. 15, '10	100
3464	---do	---do	J. Flem Johnson Co., Gastonia.	Jan. 25, '10	100
3630	---do	---do	C. Woodard Co., Wilson	Mar. 17, '10	100
3557	Purina Mill Feed, Scratch Size.	---do	Patterson Bros., Greensboro.	Feb. 21, '10	100
3716	Purina Mill Feed, Chick Size.	---do	C. A. Woodard, Wilson	July 5, '10	100
3748	---do	---do	J. T. Ginn & Co., Goldsboro.	July 14, '10	100
3726	Sterling Chicken Feed	Great Western Cereal Co., Chicago, Ill.	Matthews, Weeks & Co., Rocky Mount.	July 5, '10	100
3727	Red Comb Fine Chick Feed	Edwards & Loomis Co., Chicago, Ill.	---do	July 5, '10	100
3430	Corno Hen Feed	The Corno Mills Co., St. Louis, Mo.	T. W. Covington, Rockingham.	Jan. 15, '10	100
3444	---do	---do	Davidson & Wolff, Charlotte.	Jan. 19, '10	100
3636	Corno Chick Feed	---do	McLaurin & Shaw, Laurinburg.	Mar. 19, '10	100
3661	---do	---do	Davidson & Wolff, Charlotte.	Mar. 25, '10	100
3812	Darling's Beef Scraps	The Van Iderstine Co., Long Island City, N. Y.	City Feed Store, Hickory	Aug. 6, '10	100
3690	Rarva Meat Meal	Richmond Abattoir, Richmond, Va.	Job P. Wyatt & Sons, Raleigh.	May 19, '10	100
3374	---do	---do	---do	Dec. 1, '09	100

Thirty-five samples of Poultry Feeds were analyzed. Three are below the guarantee in protein; fourteen are below the guarantee in fat, and three are above the guarantee in fiber.

POULTRY FEEDS.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Guarantee. Fat (Ether Extract).	Guarantee. Fiber.	Guarantee. Carbohydrates.	Analysis. Protein (N x 6.25).	Analysis. Fat (Ether Extract).	Analysis. Fiber.	Analysis. Nitrogen-free Extract.	Analysis. Moisture.	Analysis. Ash.	Microscopic Examination Shows the Following Ingredients.
3440	10.00	3.50	6.00	60.00	12.00	3.17	3.60	68.63	9.77	2.83	Cracked corn, wheat, barley, oats, sunflower seed, and kaffir corn.
3826	1.00	1.00	20.00	50.00	10.50	3.15	3.03	66.90	13.69	2.73	Cracked corn and wheat screenings.
3640	10.00	3.00	5.00	60.60	11.38	2.95	3.52	69.34	10.41	2.40	Cracked corn, oats, barley, wheat, millet and kaffir corn.
3811	10.00	3.00	5.00	60.00	11.38	3.53	7.67	62.39	11.95	3.08	do.
3784	10.01	3.89	-----	-----	10.00	2.71	2.33	71.32	11.78	1.86	Cracked corn, kaffir corn and millet.
3728	10.24	2.55	3.58	66.41	11.25	3.14	3.24	66.32	11.74	4.31	Cracked corn, wheat, oats, barley, sunflower seed, buckwheat and ground limestone.
3641	10.00	3.00	2.00	60.00	11.13	2.51	2.50	66.74	9.88	7.24	Wheat and cracked corn.
3708	-----	-----	-----	-----	11.38	2.84	2.35	69.06	12.10	2.27	do.
3658	-----	-----	-----	-----	10.88	3.08	2.91	72.27	8.58	2.28	Cracked corn, wheat, kaffir corn.
3400	-----	-----	-----	-----	8.75	3.39	2.22	72.83	10.81	2.00	Wheat, barley and kaffir corn.
3516	-----	-----	-----	-----	9.75	3.58	2.01	71.38	11.36	1.92	Cracked corn and wheat.
3473	-----	-----	-----	-----	11.63	3.56	3.14	69.20	10.20	2.27	Cracked corn, wheat, barley, sunflower seed, kaffir corn, buckwheat.
3461	10.06	3.48	3.46	71.65	10.75	5.17	3.55	68.62	9.89	2.02	Cracked corn, wheat, oats, sunflower seed, kaffir corn.
3450	10.00	3.50	6.00	60.00	11.00	2.79	2.66	72.24	9.31	2.00	Cracked corn, wheat, barley and kaffir corn.
3448	10.00	3.50	6.00	60.00	9.63	4.12	3.00	71.48	9.76	2.01	Cracked corn, wheat, barley, sunflower seed, kaffir corn.
3373	10.00	2.50	7.00	-----	10.50	3.66	2.86	64.89	9.36	8.73	Wheat, cracked corn, barley, kaffir corn, sunflower seed, buckwheat and ground limestone.
3584	11.00	3.00	7.00	65.00	11.38	3.32	3.26	64.64	8.90	8.50	do.
3480	11.00	3.00	7.00	65.00	11.63	3.10	3.03	71.52	8.50	2.22	Cracked corn, wheat, barley, kaffir corn.
3712	10.00	2.50	7.00	65.00	10.00	2.74	2.26	69.90	11.04	4.06	Ground corn, millet, kaffir corn, wheat and ground bone.
3725	10.00	2.50	5.00	60.00	11.13	2.48	2.41	67.16	12.52	4.30	Wheat, ground corn, kaffir corn and millet.
3431	11.00	3.60	4.00	65.00	12.00	3.53	3.10	69.14	9.83	2.40	Cracked corn, sunflower seed, wheat, kaffir corn.
3464	11.00	3.60	4.00	65.00	11.25	3.50	3.00	70.41	9.58	2.26	Cracked corn, wheat, barley and kaffir corn.
3630	11.00	3.60	4.00	65.00	11.38	3.73	3.21	68.22	10.71	2.75	Cracked corn, wheat, millet and weed seed.
3557	11.00	3.60	4.00	65.00	11.25	3.19	3.09	70.82	9.40	2.25	Wheat, barley, sunflower seed, kaffir corn, buckwheat, cracked corn.
3716	11.00	3.60	4.00	65.00	11.00	2.89	2.94	68.18	12.86	2.13	Ground corn, millet, wheat, kaffir corn and weed seed.
3748	11.00	3.60	4.00	65.00	11.25	3.64	2.99	73.56	6.11	2.45	Cracked corn, kaffir corn, wheat and millet.
3726	10.00	3.00	4.00	65.00	10.13	2.80	1.40	71.41	12.44	1.82	Ground corn, wheat, millet and kaffir corn.
3727	10.00	2.50	5.00	60.00	10.50	2.23	1.86	70.70	12.68	2.03	Cracked corn, wheat, kaffir corn, millet and small amount charcoal.
3430	10.00	3.70	2.30	70.00	11.00	3.46	2.23	71.90	9.51	1.90	Wheat, kaffir corn and cracked corn.
3444	10.00	3.00	2.30	70.00	11.63	3.43	1.99	71.10	10.07	1.78	Cracked corn, wheat, kaffir corn, sunflower seed.
3636	10.00	3.50	3.40	70.00	10.75	3.06	2.54	71.76	9.60	2.29	Cracked corn, cracked wheat, millet seed and kaffir corn.
3661	10.00	3.50	3.40	70.00	10.38	2.80	2.43	73.09	9.05	2.25	do.
3812	55.00	5.00	-----	-----	52.88	12.93	1.21	-----	-----	-----	Ground beef scraps.
3690	85.00	7.00	-----	-----	82.63	7.44	0.17	-----	-----	-----	Meat Meal.
3374	-----	-----	-----	-----	84.13	6.29	0.24	-----	-----	-----	do.

ANALYSES OF MISCEL

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3489	Fine Feed or Feed Meal	Mountain City Milling Co., Chattanooga, Tenn.	Henderson Grocery Co., Hendersonville.	Jan. 29, '10	75
3483	do	do	Miller & Wetmore, Hendersonville.	Jan. 29, '10	75
3672	do	do	Bryson City Feed Co., Bryson City.		
3467	do	do	J. Flem Johnson Co., Gastonia.	Jan. 25, '10	75
3356	do	do	C. Z. Stokes, Louisburg		100
3639	Mixed Feed	Douthit-Riddle Co., Danville, Va.	M. A. McQueen & Son, Maxton.	Mar. 18, '10	100
3441	do	do	Irwin-Graham Co., Charlotte	Jan. 19, '10	75
3413	do	do	The Armfield Co., Fayetteville.	Jan. 13, '10	75
3445	Mill Feed	Statesville Flour Mill Co., Statesville, N. C.	Davidson & Wolff, Charlotte.	Jan. 19, '10	75
3816	Mixed Feed	Waynesville Milling Co., Waynesville, N. C.	Manufacturer	Aug. 8, '10	75
3494	Feed Stuff	do	Asheville Milling Co., Asheville.	Feb. 2, '10	
3659	Mixed Feed	Newport Mill Co., Loudon, Tenn.	Lutz & Tucker, Shelby	Mar. 28, '10	75
3484	do	do	J. D. Boyd, Hendersonville	Jan. 29, '10	75
3362	Feed	C. L. Spencer, New Bern, N. C.	Manufacturer	Nov. 12, '09	
3643	Mill Feed	Harmon & de Rundeau, Crimora, Va.	L. H. Caldwell, Lumberton	Mar. 18, '10	100
3424	do	do	Covington-Hammond Co., Laurinburg.	Jan. 14, '10	75
3381	do	do	Crowder & Rand, Raleigh	Dec. 1, '09	100
3595	do	Riverside Milling and Power Co., Cartersville, Ga.	D. L. Gore & Co., Wilmington.	Mar. 3, '10	100
3384	do	do	M. T. Norris & Bro., Raleigh	Dec. 1, '09	100
3657	Mixed Feed	E. F. Spears & Sons, Paris, Ky.	L. C. Bickett & Bro., Monroe	Mar. 24, '10	100
3437	do	do	do	Jan. 19, '10	100
3358	Feed	Boonville Milling Co., Boonville, N. C.			
3359	Mixed Feed	do			
3394	Mill Feed	Hinshaw Roller Mills, Saxapahaw, N. C.			
3398	Screenings and Bran	Clyde Roller Mills, Clyde, N. C.			
3405	Mill Feed	J. P. Huffman, Elon College, N. C.			
3455	do	Pride Milling Co., Cartersville, Ga.	W. F. Redman & Co., Charlotte.	Jan. 21, '10	75
3479	Wheat Feed	Moses Bros., Lexington, Va.	Job P. Wyatt & Sons, Raleigh.	Feb. 4, '10	100
3526	Mixed Feed	Tar Valley Mfg. Co., Hargrove, N. C.			
3529	Mill Feed	Elkin Roller Mills, Elkin, N. C.	Manufacturer	Feb. 15, '10	100
3596	Horse Feed	J. A. Meadows, New Bern, N. C.	R. L. Thornton, New Bern	Mar. 7, '10	100
3597	Feed	Bonlee Milling Co., Causey, N. C.			
3616	Horse Feed	Hooker, Churchill & Co., Kinston, N. C.	Manufacturer	Mar. 11, '10	100
3649	Mill Feed	Goldston Milling Co., Goldston, N. C.			
3650	do	High Falls Mfg. Co., High Falls, N. C.			

LANEOUS MIXED FEEDS.

Laboratory Number	Guarantee.				Analysis.						Microscopic Examination Shows the Following Ingredients.
	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Carbohydrates.	Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	
3489	12.50	5.50	8.50	60.00	14.63	4.97	5.32	62.45	8.74	3.89	Wheat and corn products.
3483	12.50	5.50	8.50	60.00	13.75	4.89	4.23	64.46	9.16	3.51	Wheat and corn product, corn bran
3672	-----	-----	-----	-----	15.38	5.38	5.94	59.69	9.02	4.59	Wheat and corn product.
3467	12.50	5.50	8.50	60.00	14.88	4.71	6.34	60.59	9.01	4.47	Wheat and corn product, corn bran.
3356	12.50	5.50	8.50	60.00	17.00	4.03	5.29	61.77	7.71	4.20	do.
3639	10.40	4.30	10.00	-----	11.75	3.46	9.40	61.51	10.58	3.30	Wheat and corn product, cob and grain.
3441	10.40	4.30	10.00	-----	12.25	4.31	10.05	59.91	9.65	3.83	do.
3413	10.40	4.30	10.00	-----	11.63	3.80	10.24	61.02	9.79	3.52	do.
3445	14.00	4.00	6.00	-----	16.88	4.80	6.16	57.20	9.83	5.13	Wheat and corn product.
3816	-----	-----	-----	-----	12.50	5.26	6.85	57.69	13.27	4.43	Wheat product and corn bran.
3494	-----	-----	-----	-----	11.63	3.28	6.79	64.00	9.21	5.09	do.
3659	13.50	4.00	8.00	-----	14.88	5.15	7.02	59.47	8.65	4.83	do.
3484	14.50	4.00	8.00	-----	17.25	4.44	7.29	55.70	9.18	6.14	Wheat product.
3362	-----	-----	-----	-----	10.75	6.12	10.44	63.52	6.11	3.06	Corn chops, wheat bran, cotton-seed meal and oats.
3613	14.50	4.00	8.00	-----	17.00	4.58	5.63	57.45	10.38	4.96	Wheat product.
3424	14.50	4.00	8.00	-----	16.25	4.66	6.13	58.62	9.87	4.47	do.
3381	14.50	4.00	8.00	-----	15.63	5.78	6.79	57.10	9.47	5.23	do.
3595	12.38	4.32	4.43	65.39	14.38	3.63	7.50	58.86	9.64	5.99	Wheat and corn products.
3384	12.38	4.32	4.43	-----	14.13	4.75	8.44	56.45	9.55	6.68	Wheat and corn products, corn bran.
3657	15.25	3.75	7.50	57.18	17.00	4.20	6.82	56.21	10.16	5.61	Wheat and corn product.
3437	15.25	3.75	7.50	57.18	16.13	4.15	4.85	60.42	10.25	4.20	Wheat product.
3358	-----	-----	-----	-----	15.50	4.48	7.39	60.51	8.01	4.11	Wheat bran and middlings.
3359	-----	-----	-----	-----	9.25	3.82	2.36	71.85	9.85	2.87	Wheat and corn product.
3394	-----	-----	-----	-----	13.13	4.00	5.12	65.22	9.15	3.38	Wheat bran and middlings, corn bran and corn meal.
3398	-----	-----	-----	-----	14.25	2.98	4.16	66.39	9.31	2.91	Wheat product.
3405	-----	-----	-----	-----	7.88	4.98	5.08	69.45	10.74	1.87	Cracked corn, wheat middlings, rye and oat products.
3455	12.38	4.32	4.43	65.39	14.13	4.32	6.22	60.94	9.27	5.12	Wheat and corn product, corn bran.
3479	16.37	5.11	7.01	56.00	17.38	4.43	5.79	59.47	8.34	4.59	Wheat product.
3526	-----	-----	-----	-----	12.50	5.26	4.96	63.13	9.84	4.31	Wheat and corn products.
3529	14.38	4.41	6.45	68.01	13.75	4.28	5.64	63.80	7.61	4.92	Wheat and corn product, corn bran.
3596	11.00	4.00	4.50	-----	9.50	4.08	4.66	69.88	9.44	2.44	Corn product, wheat bran and oats.
3597	-----	-----	-----	-----	16.63	5.12	4.35	61.02	8.51	4.37	Wheat product.
3616	11.00	4.00	4.50	-----	9.38	4.12	3.96	69.33	10.81	2.40	Cracked corn, oats and wheat bran.
3649	-----	-----	-----	-----	15.38	4.41	3.17	62.92	11.61	2.51	Wheat product.
3650	-----	-----	-----	-----	14.38	3.50	4.69	61.72	11.77	3.94	do.

ANALYSES OF MISCELLANEOUS

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.	Retail Dealer.	Date of Collection.	Claimed Weight of Package—lbs.
3656	Mill Feed	Henderson Roller Mill Co., Monroe, N. C.	Helms, Richardson & Co., Monroe.	Mar. 24, '10	100
3662	Hog and Cow Mill Feed	Dixie Milling Co., High Point, N. C.	C. E. Sielcoff, High Point	April 2, '10	75
3664	Meal and Bran	Model Mills, Lexington, N. C.	Sussey & Koonts, Lexington	April ..., '10	100
3665	Mixed Feed	Salisbury Milling Co., Salisbury, N. C.	Peeler Grocery and Provision Co., Salisbury.	Mar. 31, '10	75
3668	Feed Meal	McNeil Milling Co., Fayetteville, N. C.	Manufacturer	April 2, '10	
3671	Feed	D. H. Horner, Hemp, N. C.			
3673	....do	Allen Hedrick & Sons, Lexington, N. C.			
3679	Wheat Screenings	Efland Milling Co., Efland, N. C.	Allen-Owens Co., Durham	April 4, '10	
3676	....do		....do		
3685	Mill Feed	Franklinsville Mfg. Co., Franklinsville, N. C.			
3700	Meal and Bran	Holly Grove Roller Mill, Lexington, N. C.			
3703	Wheat Bran and Screenings	Advance Roller Mill, Advance, N. C.			
3705	Corn and Wheat	....do			
3746	Mill Feed	Mount Ulla Roller Mill Co., Mount Ulla, N. C.			
3747	Mixings	Denton Roller Mills, Denton, N. C.			
3759	Feed	Neuse Milling Co., Kinston, N. C.	Manufacturer	July 14, '10	100
3806	Mill Feed	Atlanta Milling Co., Atlanta, Ga.	Cochran & McLaughlin Co., Charlotte.	July 27, '10	75
3809	Corn and Wheat	J. T. Barbour & Sons, Clayton, N. C.			
3831	Feed	Jamestown Roller Mills, Jamestown, N. C.			

Fifty-four samples of Miscellaneous Mixed Feeds were analyzed. Five are below the guarantee in protein; eleven are below the guarantee in fat, and eleven are above the guarantee in fiber.

MICROSCOPIC EXAM

Laboratory Number.	Brand Name from Label.	Manufacturer of Wholesaler.
400 M	Shipstuff	
404 M	Feed	
405 M	Middlings	
407 M	Shipstuff	
410 M	Mixed Feed	
412 M	Shipstuff	
413 M	....do	

MIXED FEEDS—CONTINUED.

Laboratory Number.	Guarantee. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Cardro-hydrates.	Analysis. Protein (N x 6.25).	Fat (Ether Extract).	Fiber.	Nitrogen-free Extract.	Moisture.	Ash.	Microscopic Examination Shows the Following Ingredients
3656	16.00	5.00	4.00	.....	15.38	4.53	4.90	63.12	8.96	3.02	Wheat product.
3662	14.50	4.00	0.80	.....	12.88	3.79	3.90	65.08	8.59	5.67	Wheat and corn product
3664	12.00	3.50	4.00	.....	12.75	3.83	4.35	66.84	8.53	3.70	do.
3665	11.75	4.25	4.50	70.00	13.13	5.66	7.71	59.65	8.63	5.22	Wheat bran and corn bran
3668	.....	.....	.....	.....	10.13	1.12	4.58	68.83	9.67	2.67	Cracked corn wheat bran and oats
3671	.....	.....	.....	.....	12.00	3.83	7.11	64.51	8.99	3.56	Wheat and corn products, corn bran
3673	.....	.....	.....	.....	13.63	3.61	5.08	63.30	10.46	3.92	Wheat product.
3679	.....	.....	.....	.....	14.75	2.55	3.70	66.91	9.14	2.95	Wheat screenings
3676	.....	.....	.....	.....	13.88	2.89	3.49	64.71	10.75	4.37	do.
3685	.....	.....	.....	.....	11.00	3.12	4.01	67.98	10.87	3.02	Wheat, corn and oat products
3700	.....	.....	.....	.....	11.38	4.14	4.19	61.17	12.65	3.47	Wheat and corn products
3703	.....	.....	.....	.....	15.50	5.21	8.19	53.46	11.65	5.99	Wheat product.
3705	.....	.....	.....	.....	10.50	2.39	2.23	70.23	12.69	1.96	Corn and wheat product
3746	.....	.....	.....	.....	13.50	3.14	4.25	62.01	12.70	4.49	Wheat product.
3747	.....	.....	.....	.....	14.50	4.18	5.67	58.81	12.48	4.36	Wheat and corn product.
3759	8.00	4.00	6.00	.....	10.13	4.05	2.56	69.50	11.41	2.35	Cracked corn, wheat product and oats
3806	13.00	4.00	9.50	.....	13.25	4.19	4.57	59.26	14.65	4.08	Wheat and corn product.
3809	.....	.....	.....	.....	10.25	2.92	1.98	69.87	12.92	2.06	Ground corn and wheat.
3831	.....	.....	.....	.....	15.25	4.14	5.16	60.57	8.47	6.41	Wheat product and screenings

INATION OF FEEDS.

Laboratory Number.	Retail Dealer.	Microscopic Examination Shows the Following Ingredients.
400 M	S. M. Sharp, Burlington	Wheat product.
404 M	J. A. Davis, High Point	Wheat products and screenings.
405 M	W. A. Hahn, Hickory	Wheat product and small amount corn meal.
407 M	Thos. H. Vaughn, Eure	Wheat product.
410 M	W. T. Harding, Raleigh	Wheat and corn product.
412 M	Moser Grocery Co., Winston	Wheat products
413 M	Geo. O. Hege, Winston	do.

MICROSCOPIC EXAMINATION

Laboratory Number.	Brand Name from Label.	Manufacturer or Wholesaler.
469 M	Shipstuff	
484 M	Wheat Bran	
446 M	Shipstuff	Ballard & Ballard Co., Louisville, Ky.
483 M	do	do
406 M	do	do
470 M	do	do
485 M	do	do
482 M	Wheat Bran	do
401 M	Pure Wheat Shorts	Cumberland Mills, Nashville, Tenn.
427 M	Shipstuff	Statesville Flour Mill Co., Statesville, N. C.
421 M	do	do
420 M	do	do
417 M	do	do
419 M	do	do
479 M	Mill Feed	do
403 M	Bran	Tennessee Mill Co., Estill Springs, Tenn.
425 M	Wheat Bran	do
436 M	do	do
448 M	do	do
454 M	do	do
480 M	do	do
409 M	Shorts	do
434 M	Wheat Shorts	do
455 M	do	do
440 M	Pillsbury's Middlings	Pillsbury Mills, Minneapolis, Minn.
428 M	do	do
429 M	Daisy Middlings	do
472 M	Shipstuff	Harrisonburg Milling Co., Harrisonburg, Va.
414 M	Wheat Bran	do
442 M	Peerless Feed	J. Allen Smith & Co., Knoxville, Tenn.
423 M	do	do
475 M	Shipstuff	The Dunlap Milling Co., Clarksville, Tenn.
450 M	Wheat Middlings	do
451 M	Wheat Bran	do
415 M	do	Mountain City Mill Co., Chattanooga, Tenn.
422 M	do	do
424 M	do	do

OF FEEDS—CONTINUED.

Laboratory Number.		Retail Dealer	Microscopic Examination Shows the Following Ingredients.
469	M	J. D. Howard Durham	Wheat products.
484	M	Moon & Taylor Bros., Durham	Wheat bran.
446	M	T. P. Nash, Elizabeth City	Wheat product.
483	M	J. E. Moore, Jackson	do.
406	M	J. M. Henderson, Method	do.
470	M	C. V. Williams & Co., Hamlet	do.
485	M	S. E. Dilday, Ahoskie	do.
482	M	J. E. Moore, Jackson	Wheat bran.
401	M	M. E. Stead, Carthage	Wheat product, low grade.
427	M	A. M. Church & Sons, North Wilkesboro	Wheat product.
421	M	Piedmont Grocery Co., Hickory	do.
420	M		do.
417	M	Asheville Hay and Grain Co., Asheville	do.
419	M	J. A. Shuping, Morganton	do.
479	M	Davidson & Wolff, Charlotte	Wheat and corn product.
408	M		Wheat bran.
425	M	Elkin Roller Mills, Elkin	do.
436	M	W. H. Turner, Winston	do.
448	M	D. L. Gore & Co., Wilmington	do.
454	M	John E. Ham, Murphy	do.
480	M	Thompson Grocery and Feed Store, Salisbury	do.
409	M		Wheat middlings.
434	M	P. R. Lambe & Co., Winston	Wheat product.
455	M	John E. Ham, Murphy	Wheat middlings.
440	M	J. R. Bell, Morehead City	do.
428	M	G. C. Welch, Mt. Airy	do.
429	M	Shelton Bros., Winston	do.
472	M	H. C. Watson, Rockingham	Wheat product.
414	M	A. H. Matthews, Raleigh	Wheat bran.
442	M	W. S. White & Co., Elizabeth City	Wheat and corn product.
423	M	Carolina Feed Co., Statesville	do.
475	M	L. C. Bickett & Bro., Monroe	Wheat product.
450	M	The Stone Co., Wilmington	Wheat middlings.
451	M	A. W. King & Co., Wilmington	Wheat bran.
415	M	Asheville Grocery Co., Asheville	do.
422	M	J. E. Sloop, Statesville	do.
424	M	Carolina Flour and Feed Co., Statesville	do.

MICROSCOPIC EXAMINATION

Laboratory Number.	Brand Name from Label	Manufacturer or Wholesaler.
441 M	Wheat Bran	Mountain City Mill Co., Chattanooga, Tenn.
443 M	....do	....do
416 M	Fine Feed or Feed Meal	....do
418 M	....do	....do
430 M	....do	....do
447 M	....do	....do
438 M	Shipstuff	Hickory Milling Co., Hickory, N. C.
444 M	Cracked Corn	S. D. Scott & Co., Norfolk, Va.
476 M	Thoroughbred Feed	Lexington Roller Mills Co., Lexington, Ky.
459 M	Wheat Bran	Dan Valley Mills, Danville, Va.
463 M	....do	....do
433 M	Wheat Shipstuff	....do
461 M	....do	....do
474 M	....do	....do
453 M	Wheat Shorts	Liberty Mills, Nashville, Tenn.
435 M	....do	....do
449 M	Shipstuff	Piedmont Mills, Lynchburg, Va.
431 M	....do	....do
437 M	Wheat Bran	....do
473 M	....do	The Dunlop Mills, Richmond, Va.
426 M	Shipstuff	....do
467 M	White Middlings	C. A. Gambrill Mfg. Co., Baltimore, Md.
462 M	....do	....do
458 M	....do	....do
466 M	Sucrene Alfalfa Horse and Mule Feed	American Milling Co., Chicago, Ill.
465 M	Sucrene Horse and Mule Feed	....do
460 M	Sucrene Daisy Feed	....do
445 M	....do	....do
432 M	Perfecto Feed Meal	Southern Cotton Oil Co., Charlotte, N. C.
452 M	Wheat Bran	Acme Mills and Elevator Co., Hopkinsville, Ky.
456 M	Kornfalfa Feed	Kornfalfa Feed Milling Co., Kansas City, Mo.
464 M	Carolina Rice Meal	Carolina Rice Mills, Goldsboro, N. C.
457 M	....do	....do
471 M	Purina Mill Feed	Ralston Purina Co., St. Louis, Mo.
477 M	Mixed Feed	Douthit-Riddle Co., Danville, Va.
478 M	Acme Feed	Acme Milling Co., Talbot, Tenn.
481 M	Shipstuff	J. D. Manor & Co., New Market, Va.

OF FEEDS—CONTINUED.

Laboratory Number.	Retail Dealer	Microscopic Examination Shows the Following Ingredients.
441 M	C. L. Spencer, New Bern	Wheat bran.
443 M	S. P. Nash, Elizabeth City	do.
416 M	Asheville Grocery Co., Asheville	Wheat and corn product.
418 M	Asheville Hay and Grain Co., Asheville	do.
430 M	Miller & Wolff, Rural Hall	do.
447 M	R. L. Thornton, New Bern	do.
438 M	C. W. Rosenberger, Granite Falls	Wheat product and small amount corn meal
444 M	Pippin & Woolard, Washington	Cracked corn.
476 M	L. C. Bickett & Bro., Monroe	Wheat product and corn bran.
459 M	Wells Grocery Co., Wilson	Wheat bran.
463 M	M. J. Best & Sons, Goldsboro	do.
433 M	P. R. Lambe & Co., Winston	Wheat product
461 M	B. G. Thompson, Goldsboro	do.
474 M	J. D. Horn, Wadesboro	do.
453 M	J. C. Bennett & Co., Waynesville	Wheat middlings
435 M	E. R. Messick, Winston	Wheat product
449 M	The Worth Co., Wilmington	do.
431 M	Farmer's Stock Co., Winston	do.
437 M	Elmore Maxwell Co., Greensboro	do.
473 M	The Hardison Co., Wadesboro	Wheat bran.
426 M	S. W. Cockerham & Son, Elkin	Wheat products.
467 M	Wells Grocery Co., Wilson	Wheat middlings.
462 M	C. Woodard Co., Wilson	do.
458 M	Hadley Haines Co., Wilson	do.
466 M	C. D. Taylor & Co., Goldsboro	Alfalfa meal, wheat product, linseed meal, ground oats, buckwheat and barley.
465 M	C. Woodard Co., Wilson	Screenings, cracked corn, oat product, cotton-seed meal and molasses.
460 M	....do	Screenings, cotton-seed meal, malt sprouts, brewer's grains, and molasses
445 M	W. S. White & Co., Elizabeth City	Screenings, cotton-seed meal, malt sprouts, and molasses.
432 M	Farmers Stock Co., Winston	Cotton-seed meal and hulls.
452 M	John S. McEachern & Sons, Wilmington	Wheat bran.
456 M	B. G. Thompson, Goldsboro	Alfalfa meal, cracked corn, corn meal and corn oats.
464 M	M. J. Best & Sons, Goldsboro	Rice product
457 M	B. G. Thompson, Goldsboro	do.
471 M	A. W. Potter & Co., Rockingham	Cracked corn, Kaffir corn, wheat, barley, sunflower seed.
477 M	Johnson Bros., Charlotte	Wheat and corn product, ground corncob.
478 M	W. G. Fite, Charlotte	Wheat and corn product, corn bran.
481 M	H. M. Blackwelder, Concord	Wheat product.

SUMMARY.

Wheat Bran and Mixed Brans.—Fifty-six samples were analyzed. Three are below the guarantee in protein; five are below the guarantee in fat, and four are above the guarantee in fiber.

Fifty-four of these are pure wheat brans and two are mixtures of wheat and corn bran.

Middlings or Shorts.—Sixty-nine samples were analyzed. Four are below the guarantee in protein; ten are below the guarantee in fat, and seventeen are above the guarantee in fiber.

Bran and Shorts.—Thirteen samples were analyzed. Three are below the guarantee in protein, two are below the guarantee in fat, and one is above the guarantee in fiber. Eleven of these samples are wheat products and two are wheat and corn products.

Shipstuff.—Forty-one samples were analyzed. Seven are below the guarantee in protein, ten are below the guarantee in fat, and five are above the guarantee in fiber. Thirty-five of these samples are wheat products and six are wheat and corn products.

Rye Feeds.—Five samples were analyzed. All come up to the guarantees.

Corn and Oat Feeds.—Seventeen samples were analyzed. Six are below the guarantee in protein, seven are below the guarantee in fat, and one is above the guarantee in fiber.

Rice Feeds.—Thirteen samples were analyzed. Four are below the guarantee in protein, six are below the guarantee in fat, and seven are above the guarantee in fiber.

Molasses Feeds.—Twenty-three samples were analyzed. Six are below the guarantee in protein, seven are below the guarantee in fat, and eight are above the guarantee in fiber.

On the whole, this class of feeds shows a marked improvement over the product found on the markets during previous years. Fewer weed seeds were found in the samples, and in general a higher class of ingredients have been used in making these feeds. Molasses Grains, manufactured by E. P. Mueller of Norfolk, Va., are still low-grade adulterated products.

Alfalfa Feeds.—Twenty-seven samples were analyzed. Nine are below the guarantee in protein, eleven are below the guarantee in fat, and nine are above the guarantee in fiber.

Dried Beet Pulp.—Three samples were analyzed. All come up to the guarantee.

Chop Feeds and Meals.—Eighteen samples were analyzed. Five are below the guarantee in protein, seven are below the guarantee in fat, and four are above the guarantee in fiber.

Cotton-seed Meal Feeds.—Twenty-nine samples were analyzed. Ten are below the guarantee in protein, twelve are below the guarantee in fat, and nine are above the guarante in fiber.

Peanut Meal.—One sample of peanut meal was analyzed. This is below the guarantee in protein.

Gluten Feed.—One sample of gluten feed was analyzed. This comes up to the guarantee.

Cracked Corn.—Thirty samples were analyzed. Nineteen are below the guarantee in protein, sixteen are below the guarantee in fat, and two are above the guarantee in fiber. Two of these samples contain a considerable amount of cob and one contains damaged corn.

Special Mixed Feeds.—Thirty-two samples were analyzed. Seven are below the guarantee in protein, eight are below the guarantee in fat, and nine are above the guarantee in fiber.

Poultry Feeds.—Thirty-five samples were analyzed. Three are below the guarantee in protein; fourteen are below the guarantee in fat and three are above the guarantee in fiber.

Miscellaneous Mixed Feeds.—Fifty-four samples were analyzed. Five are below the guarantee in protein, eleven are below the guarantee in fat, and eleven are above the guarantee in fiber.

Microscopic Examination of Feeds Not Analyzed.—Eighty-one samples were examined that were not analyzed chemically.

Cotton-seed Meals.—One hundred and ten samples were analyzed. Thirty-four are below the guarantee of 6.18 per cent nitrogen or 7.50 per cent ammonia (38.62 per cent protein).

INSPECTION AND ANALYSIS OF COTTON-SEED MEAL.

The Cotton-seed Meal Law of this State requires that all cotton-seed meal sold in the State shall contain 6.18 per cent nitrogen (equivalent to 7.50 per cent ammonia and 38.63 per cent protein) or more. One hundred and ten samples of cotton-seed meal have been analyzed. These samples were taken in different parts of the State at different times and represent the quality of this product that is offered for sale in the State. Thirty-four of the samples analyzed or 30.9 per cent are below the standard of 6.18 per cent nitrogen.

ANALYSES OF COTTON-SEED MEAL.[1]

Laboratory Number.	Name and Address of Manufacturer.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.	Per Cent Protein Found.
4090	Battleboro Oil Co., Battleboro, N. C.	6.18	7.50	6.52	7.93	40.75
4068	....do	6.18	7.50	6.48	7.88	40.50
4083	....do	6.18	7.50	6.40	7.78	40.00
4028	....do	6.18	7.50	6.24	7.58	39.00
4158	Chatham Cotton Oil Co., Pittsboro, N. C.	6.18	7.50	6.14	7.47	38.38
4111	....do	6.18	7.50	6.42	7.81	40.13
4189	Chester Oil Mill, Chester, S. C.	6.18	7.50	6.40	7.78	40.00
4042	Cleveland Oil and Fertilizer Co. Cleveland, N. C.	6.18	7.50	6.44	7.83	40.25
4102	Consumers Cotton Oil Co., Tarboro, N. C.	6.18	7.50	6.44	7.83	40.25
4191	....do	6.18	7.50	6.20	7.54	38.75
4156	....do	6.18	7.50	6.10	7.42	38.13
4171	....do	6.18	7.50	5.98	7.27	37.38
4139	Cotton Oil and Ginning Co., Scotland Neck, N. C.	6.18	7.50	6.08	7.39	38.00
4047	Dunn Oil Mill Co., Dunn, N. C.	6.18	7.50	6.44	7.83	40.25
4132	....do	6.18	7.50	6.30	7.66	39.38
4165	....do	6.18	7.50	5.72	6.95	35.75
4134	Eastern Cotton Oil Co., Hertford, N. C.	6.18	7.50	6.46	7.85	40.38
4146	....do	6.18	7.50	6.26	7.61	39.13
4053	....do	6.18	7.50	6.24	7.59	39.00
4192	....do	6.18	7.50	6.18	7.51	38.63
4128	Elba Mfg. Co., Charlotte, N. C.	6.18	7.50	6.60	8.02	41.25
4135	....do	6.18	7.50	6.48	7.88	40.50
4034	....do	6.18	7.50	6.46	7.85	40.38
4138	....do	6.18	7.50	6.02	7.32	37.63
4121	Farmers Oil Mill Co., Nashville, N. C.	6.18	7.50	6.48	7.88	40.50
4160	....do	6.18	7.50	6.44	7.83	40.25
4122	....do.....Wilson, N. C.	6.18	7.50	6.52	7.93	40.75
4148	....do	6.18	7.50	5.86	7.12	36.63
4105	Fremont Oil Mill Co., Fremont, N. C.	6.18	7.50	6.24	7.59	39.00
4158	Georgia Cotton Oil Co., Augusta, Ga.	6.18	7.50	6.10	7.42	38.13
4058	Havens Oil Co., Washington, N. C.	6.18	7.50	6.48	7.88	40.50
4145	....do	6.18	7.50	6.46	7.85	40.38
4149	....do	6.18	7.50	6.32	7.68	39.50
4110	Kershaw Oil Mill, Kershaw, N. C.	6.18	7.50	6.36	7.73	39.75
4029	Kings Mountain Cotton Oil Co., Kings Mountain, N. C.	6.18	7.50	7.06	8.57	44.06

[1] The nitrogen determinations were made by J. M. Pickel.

ANALYSES OF COTTON-SEED MEAL—CONTINUED.

Laboratory Number.	Name and Address of Manufacturer.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.	Per Cent Protein Found.
4025	Kings Mountain Cotton Oil Co., Kings Mountain, N. C.	6.18	7.50	6.90	8.38	43.06
4137	Laurinburg Oil Co., Laurinburg, N. C.	6.18	7.50	6.58	8.00	41.13
4106	...do	6.18	7.50	6.26	7.61	39.13
4114	...do	6.18	7.50	5.68	6.91	35.50
4147	Lenoir Oil and Ice Co., Kinston, N. C.	6.18	7.50	6.44	7.83	40.25
4130	...do	6.18	7.50	6.36	7.73	39.75
4055	...do	6.18	7.50	6.32	7.68	39.50
4041	Lorene Cotton Oil Mills, Mooresville, N. C.	6.18	7.50	6.58	8.00	41.13
4157	Louisburg Cotton Oil Co., Louisburg, N. C.	6.18	7.50	6.20	7.54	38.75
4044	Lumberton Cotton Oil and Ginning Co., Lumberton, N. C.	6.18	7.50	6.36	7.73	39.75
4161	McCaw Mfg. Co., Macon, Ga.	6.18	7.50	6.22	7.56	38.88
4054	Morgan Oil and Fertilizer Co., Red Springs, N. C.	6.18	7.50	7.06	8.58	44.13
4127	North Carolina Cotton Oil Co., Charlotte, N. C.	6.18	7.50	6.22	7.56	38.88
4107	...do	6.18	7.50	6.16	7.49	38.50
4120	...do ...Henderson, N. C.	6.18	7.50	6.18	7.51	38.62
4150	...do	6.18	7.50	5.98	7.27	37.38
4112	...do ...Raleigh, N. C.	6.18	7.50	6.04	7.34	37.75
4153	...do	6.18	7.50	5.76	7.00	36.00
4057	...do ...Wilmington, N. C.	6.18	7.50	6.10	7.42	38.13
4064	...do	6.18	7.50	6.02	7.32	37.63
4155	...do	6.18	7.50	5.98	7.27	37.38
4159	...do	6.18	7.50	5.88	7.15	36.75
4176	...do	6.18	7.50	5.82	7.08	36.38
4077	Pine Level Oil Mill Co., Pine Level, N. C.	6.18	7.50	6.66	8.10	41.63
4133	...do	6.18	7.50	6.54	7.95	40.88
4104	...do	6.18	7.50	6.36	7.73	39.75
4037	...do	6.18	7.50	6.32	7.68	39.50
4024	...do	6.18	7.50	6.32	7.68	39.50
4061	...do	6.18	7.50	5.96	7.24	37.25
4095	Pitt County Oil Co., Winterville, N. C.	6.18	7.50	6.06	7.37	37.88
4079	Planters Cotton-seed Oil Co., Rocky Mount, N. C.	6.18	7.50	6.20	7.54	38.75
4065	...do	6.18	7.50	6.08	7.38	37.94
4010	Scotland Neck Cotton Oil and Ginning Co., Scotland Neck, N. C.	6.18	7.50	6.16	7.48	38.44
4059	Southern Cotton Oil Co., Charlotte, N. C.	6.18	7.50	6.58	8.00	41.13
4152	...do	6.18	7.50	6.44	7.83	40.25
4124	...do	6.18	7.50	6.12	7.44	38.25
4117	...do	6.18	7.50	6.10	7.42	38.13
4109	...do ...Concord, N. C.	6.18	7.50	6.86	8.34	42.88

ANALYSES OF COTTON-SEED MEAL—CONTINUED.

Laboratory Number.	Name and Address of Manufacturer.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.	Per Cent Protein Found.
4174	Southern Cotton Oil Co., Concord, N. C.	6.18	7.50	6.62	8.05	41.38
4129	....do	6.18	7.50	6.16	**7.49**	**38.50**
4063	....do....Conetoe, N. C.	6.18	7.50	6.62	8.05	41.38
4056	....do	6.18	7.50	5.94	**7.22**	37.13
4046	....do....Davidson, N. C.	6.18	7.50	6.98	8.49	**43.63**
4050	....do	6.18	7.50	6.90	8.39	**43.13**
4131	....do....Fayetteville, N. C.	6.18	7.50	6.22	7.56	38.88
4113	....do	6.18	7.50	6.26	7.61	39.13
4186	....do	6.18	7.50	6.16	**7.49**	38.50
4115	....do....Gastonia, N. C.	6.18	7.50	6.50	8.39	**43.13**
4049	....do	6.18	7.50	6.74	8.19	**42.13**
4103	....do....Goldsboro, N. C.	6.18	7.50	6.30	7.71	39.63
4151	....do	6.18	7.50	6.22	7.56	38.88
4126	....do....Monroe N. C.	6.18	7.50	6.54	7.95	40.88
4175	....do	6.18	7.50	6.36	7.73	39.75
4116	....do....Rocky Mount, N. C.	6.18	7.50	6.44	7.83	40.25
4062	....do	6.18	7.50	6.16	**7.49**	38.50
4045	....do....Selma, N. C.	6.18	7.50	6.38	7.76	39.88
4043	....do....Shelby, N. C.	6.18	7.50	6.20	7.54	38.75
4108	....do	6.18	7.50	6.08	**7.39**	**38.00**
4154	....do	6.18	7.50	5.88	**7.15**	36.75
4918	....do....Spartanburg, S. C.	6.18	7.50	6.66	8.10	**41.63**
4173	....do	6.18	7.50	6.56	7.98	41.00
4163	....do	6.18	7.50	6.04	**7.34**	37.75
4119	....do....Spring Hope, N. C.	6.18	7.50	6.78	8.24	**42.38**
4011	....do....Tarboro, N. C.	6.18	7.50	7.70	9.35	**48.06**
4185	....do	6.18	7.50	6.34	7.71	39.63
4052	....do	6.18	7.50	6.18	7.51	38.63
4187	....do	6.18	7.50	6.10	**7.42**	38.13
4125	....do....Wadesboro, N. C.	6.18	7.50	6.22	7.56	38.88
4123	....do....Wilson, N. C.	6.18	7.50	6.48	7.88	**40.50**
4136	....do	6.18	7.50	6.12	**7.44**	38.25
4059	Speed Milling Co., Speed, N. C.	6.18	7.50	6.78	8.24	**42.38**
4093	Stanly Cotton Oil Co., Norwood, N. C.	6.18	7.50	6.28	7.64	39.25
4051	Tar River Oil Co., Tarboro, N. C.	6.18	7.50	6.38	7.76	39.88
4162	Taylor Mfg. Co., Columbia, S. C.	6.18	7.50	6.22	7.56	38.88
4205	Tennille Oil Co., Tennille, Ga.	6.18	7.50	5.70	**6.93**	35.63

THE BULLETIN

OF THE

NORTH CAROLINA

DEPARTMENT OF AGRICULTURE

RALEIGH

Volume 31, No. 12 DECEMBER, 1910 Whole Number 143

ELEVEN[illegible] REPORT

—ON—

FOOD ADULTERATION

UNDER THE PURE FOOD LAW

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION

ENTERED AT THE RALEIGH POST-OFFICE AS SECOND-CLASS MAIL MATTER

STATE BOARD OF AGRICULTURE

W. A. GRAHAM, *Commissioner, ex officio* Chairman, Raleigh.

H. C. CARTER	Fairfield	First District.
K. W. BARNES	Lucama	Second District.
WILLIAM DUNN	New Bern	Third District.
I. H. KEARNEY	Franklinton	Fourth District.
R. W. SCOTT	Haw River	Fifth District.
A. T. MCCALLUM	Red Springs	Sixth District.
J. P. MCRAE	Laurinburg	Seventh District.
WILLIAM BLEDSOE	Gale	Eighth District.
W. J. SHUFORD	Hickory	Ninth District.
A. CANNON	Horse Shoe	Tenth District.

OFFICERS AND STAFF

W. A. GRAHAM	Commissioner.
ELIAS CARR	Secretary.
B. W. KILGORE	State Chemist, Director Test Farms.
FRANKLIN SHERMAN, JR	Entomologist.
W. N. HUTT	Horticulturist.
H. H. BRIMLEY	Naturalist and Curator.
T. B. PARKER	Demonstration Work.
W. M. ALLEN	Food Chemist.
W. G. CHRISMAN	State Veterinarian.
BRONSON BARLOW	Botanist.
J. M. PICKEL	Assistant Chemist.
W. G. HAYWOOD	Fertilizer Chemist.
G. M. MACNIDER	Feed Chemist and Microscopist.
L. L. BRINKLEY	Assistant Chemist.
S. C. CLAPP	Nursery and Orchard Inspector.
S. B. SHAW	Assistant Horticulturist.
Z. P. METCALF	Assistant Entomologist.
J. A. CONOVER	Dairyman.
J. L. BURGESS	Agronomist.
E. L. WORTHEN	Soil Investigation.
*W. E. HEARN	Soil Survey.
J. Q. JACKSON	Assistant Chemist.
W. A. SMITH	Assistant Chemist.
W. H. STROWD	Assistant Chemist.
E. W. THORNTON	Assistant Chemist.
W. H. EATON	Assistant Dairyman.
E. P. WOOD	Assistant Veterinarian.

R. W. SCOTT, JR., Superintendent Edgecombe Test Farm, Rocky Mount, N. C.
F. T. MEACHAM, Superintendent Iredell Test Farm, Statesville, N. C.
JOHN H. JEFFERIES, Superintendent Pender Test Farm, Willard, N. C.
R. W. COLLET, Superintendent Transylvania and Buncombe Test Farms, Swannanoa, N. C.

* Assigned by the Bureau of Soils, United States Department of Agriculture.

RALEIGH, December 1, 1910.

SIR:—I submit herewith manuscript covering the investigations that have been made during the past year under the State Food Law, chapter 368, Laws of 1907. I recommend its publication as the December BULLETIN and Eleventh Annual Food Report.

Yours truly,

W. M. ALLEN,
State Food Chemist.

To HON. W. A. GRAHAM,
Commissioner of Agriculture.

REPORT ON FOOD ADULTERATION FOR 1910.

By W. M. ALLEN, State Food Chemist,
Assisted by
W. A. SMITH, Assistant Chemist

A general statement, decisions of the court, an extract from the Food Law, rules on labeling, a notice regarding the action of the Commissioner relative to the use of benzoate in food, comments on the use of chemical preservatives in food, a summary of results obtained during previous years, and the results of the examination of food products for the year 1910—constituting the eleventh annual report under the Food Law—are presented in the following pages:

PROSECUTIONS UNDER THE FOOD LAW.

During the year twelve violations have been sent to the State Solicitors for prosecution under the Food Law. The following have been concluded, with the results stated below:

State v. J. K. Boynton, in Buncombe County Superior Court, for the sale of misbranded liquor. Defendant pleaded guilty, and was fined $100 and cost.

State v. X. Lang, in Buncombe County Superior Court, for the sale of misbranded liquor. Defendant pleaded guilty, and was fined $100 and cost.

State v. W. H. Bush, in Buncombe County Superior Court, for the sale of misbranded liquor. Defendant pleaded guilty, and was fined $100 and cost.

State v. O. K. Wainscott, in Buncombe County Superior Court, for the sale of misbranded liquor. Defendant pleaded guilty, and was fined $100 and cost.

State v. A. N. Talley, in Buncombe County Superior Court, for the sale of misbranded liquor. Defendant pleaded guilty, and was fined $100 and cost.

State v. Noland & McIntyre, grocers, in Buncombe County Superior Court, for the sale of adulterated and misbranded butter. Defendants pleaded guilty of an unintentional violation, and were dismissed upon the payment of the cost.

State v. Felmet Bros., grocers, in Buncombe County Superior Court, for the sale of adulterated and misbranded butter. Defendants pleaded guilty of unintentional violation, and were dismissed upon the payment of the cost.

GENERAL STATEMENT.

When of general interest or when it will facilitate the enforcement of the Food Law, examinations will be made of food or beverages for parties within the State, provided samples of same are taken and sent to the Food Chemist in accordance with instructions from the Department, and the required information concerning the sample is furnished.

Results of analyses are sent to parties sending samples and parties from whom samples are obtained by the Department, as well as the manufacturer of the products.

It is the desire of the Department to put information into the hands of manufacturers, dealers and consumers of food, and to assist them in every way it can to know and manufacture, handle and use the best, most desirable and most wholesome food products. The Food Control is in the interest of the honest manufacturer, the honest dealer, and for the protection of the consumer.

EXTRACT FROM FOOD LAW

The following extract from the Pure Food law is very important, and the same is herewith printed in order that the grocerymen may become more familiar with the requirements of the law.

State Food Law, section 6, defines and describes what constitutes food adulteration. Section 7 defines and describes what constitutes the misbranding of food products. Section 9 provides for a guaranty by which the retail dealer may be exempt from prosecution for violation of the law.

EXTRACT FROM FOOD LAW.

SEC. 6. That for the purpose of this act an article shall be deemed to be adulterated, in the case of food—

First. If any substance has been mixed or packed with it, so as to reduce or lower or injuriously affect its quality or strength.

Second. If any substance has been substituted, wholly or in part, for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted.

Fourth. If it be mixed, colored, powdered, coated or stained in a manner whereby damage or inferiority is concealed.

Fifth. If it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health. If it contains any of the following substances, which are hereby declared deleterious and dangerous to health when added to human food, to wit: Colors which contain antimony, arsenic, barium, lead, cadmium, chromium, copper, mercury, uranium or zinc; or the following colors: gamboge, corallin, picric acid, aniline, or any of the coal-tar dyes; dulcin, glucin, or any other artificially or synthetically prepared substitute for sugar except saccharine; paraffin, formaldehyde, beta-naphthol, abrastol, benzoic acid or benzoates, salicylic acid or salicylates, boric acid or borates, sulphurous acid or sulphites, hydrofluoric acid or any fluorine compounds, sulphuric acid or potassium sulphate or wood alcohol: *Provided*, that catsups and condimental sauces may, when the fact is plainly and legibly stated in the English language on the wrapper and label of the package in which it is

retailed, contain not to exceed two-tenths of one per cent of benzoic acid or its equivalent in sodium benzoate. Fermented liquors may contain not to exceed two-tenths of one per cent of combined sulphuric acid, and not to exceed eight-thousandths of one per cent of sulphurous acid.

Sixth. If it consists in whole or in part of a filthy, decomposed or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal or one that had died otherwise than by slaughter. In addition to the ways already provided, sausage shall be deemed to be adulterated if it is composed in any part of liver, lungs, kidneys or other viscera of animals: *Provided*, that the use of animal intestines as sausage casings shall not be deemed to be an adulteration.

Seventh. If it differs in strength, quality or purity from the standards of purity of food products that have been or may be from time to time adopted by the Board of Agriculture.

SEC. 7. That the term "misbranded," as used herein, shall apply to all drugs or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design or device regarding such article or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the State, Territory or country in which it is manufactured or produced.

That for the purpose of this act an article shall also be deemed to be misbranded, in the case of food—

First. If it be an imitation of or offered for sale under the distinctive name of another article.

Second. If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if it fail to bear a statement on the label of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate or acetanilide, or any derivative or preparation of any such substances contained therein.

Third. If in package form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package.

Fourth. If the package containing it or its label shall bear any statement, design or device regarding the ingredients or the substances contained therein, which statement, design or device shall be false or misleading in any particular: *Provided*, that an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

First. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where said article has been manufactured or produced.

Second. In the case of articles labeled, branded or tagged so as to plainly indicate that they are compounds, imitations or blends, and the word "compound," "imitation" or "blend," as the case may be, is plainly stated on the package in which it is offered for sale: *Provided*, the labeling is according to the rules prescribed by the Board of Agriculture: *Provided*, that the term "blend," as used herein, shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only.

SEC. 9. That no dealer shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer or other party, residing in North Carolina, from whom he purchased such articles, to the effect that the same is not adulterated or misbranded within the meaning of this act, designating it.

RULES OF THE STATE BOARD OF AGRICULTURE UNDER THE FOOD LAW IN REGARD TO LABELING FOOD PRODUCTS.

A label must be, as far as possible, attached to each package, and contain, in addition to other information, the name of the material, the name and address of the manufacturer, importer or jobber. When the words "artificial," "imitation," "compound," "adulterated," or other words of similar import, are required, they must be on the principal label and immediately precede or follow the word or words they modify, which must be the principal word or words of the label, and be in at least half the size and same style of type and on the same kind of background as the word or words with which they are closely associated. The principal words in the label must be printed in either dark-colored letters on a light-colored background or light-colored letters on a dark-colored background. Any statement that is required on the principal label of a barrel or cask of molasses, molasses compound, syrup or compound syrup, vinegar or compound vinegar, must appear on one end or head of the barrel or cask; and if the principal label or any part of it appears on both ends of barrel or cask, they shall be identical, one to the other.

The label on bottled soft drinks must bear the name and address of the bottler.

Where the presence of preservatives, coloring matter or other substance or substances is required to be printed on the label, the printing must be done clearly and conspicuously on the label, in type not smaller than *brevier heavy gothic caps,* and on the same kind of background as the rest of the label.

Retail dealers, while offering food or beverage for sale, must keep the label so that it may be seen by purchaser or inspector, and the label must be so kept that it will remain legible.

ACTION OF THE COMMISSIONER RELATIVE TO THE USE OF BENZOATE.

As the highest authorities differ regarding the effect of benzoate of soda on digestion and health, and as it appears that the constitutionality of the State law that forbids its use in food depends largely upon its effect on health, and as the attorney for the Department, under the circumstances, advises it, until further notice no prosecution will be made for the use of benzoate of soda in food in quantities not exceeding one-tenth of one per cent (0.1), provided that its presence is plainly stated on the principal label of the package in letters not smaller than eight point (brevier) caps.

THE USE OF CHEMICAL PRESERVATIVES IN FOOD PRODUCTS.

When the food report for 1909 was published it was hoped that before another annual report was to be made that the constitutionality of State laws that forbid the use of chemical preservatives in food would be decided by the Federal courts. The matter is still before the court in an injunction suit by a manufacturer to prevent officials from enforcing the State laws. The evidence has been taken, the arguments have been made, and the matter is now in the hands of the court for decision.

From the attitude of many officials, if the State laws are held to be constitutional, it is evident that the use of benzoate in food will be prohibited in many States.

The attention of dealers of this State is called to the following article which was published in the food report of this Department for 1909, and is reprinted here because of the importance of the subject:

"Food products that contain much moisture naturally tend to decompose or decay, especially in warm weather. Various means, such as drying, sterilizing by heat in air-tight containers, preserving and pickling with the natural food preservatives, such as sugar, salt, vinegar, spices, etc., are employed to prevent the decomposition of such products and to keep them in a suitable condition for food. These processes have long been in use and are recognized as being wholesome. These natural food preservatives are sometimes supplemented with another class of preservatives known as antiseptics or chemical preservatives, which are more or less poisonous in their nature.

"While all food products can be kept in good condition by the natural methods above mentioned, there are a few, such as crushed fresh fruit, apple cider, etc., to which the application of the natural methods tend to either render less desirable or too expensive for general use. In these few products there is some reason for the use of a chemical preservative to keep them in good condition; but in most products, especially in such as condensed milk, canned meats, canned soups, canned vegetables, canned fruit, mince-meat, preserves, jam, jelly, pickles, etc., there is absolutely no need for the use of a chemical preservative. The high-class manufacturers of this country have shown beyond a doubt that chemical preservatives are unnecessary in such products. A few manufacturers claim that a better product can be made by the use of a chemical preservative than can be made without it. The facts in the case, however, do not bear out their statement. The results of the examinations of this Department during the past ten years show that chemical preservatives have not been used in the higher class products; but, on the contrary, they were found in the lower, cheaper grades, that were often otherwise

adulterated. If a better product can be made by the use of a chemical preservative, then why has the use of the chemical preservative been confined so much to the inferior and often otherwise adulterated products instead of the higher class ones? And why have most of the high-class manufacturers either never used or have discontinued the use of chemical preservatives? It would seem that the only conclusion is that the preservative was not and is not used to improve the quality of the product, but to cheapen it. That being the case, then why use a product that contains a chemical that may be injurious to health? The effect of benzoate of soda on health is a disputed question, of course; but why take the risk of permanent injury to health that may produce an earlier death when there is no need for it?

"After having made experiments for the government to test the effect of benzoate of soda on health, one set of officials say that it is injurious to health; another set say that it is not. Many State officials think the use of benzoate in food objectionable, and the Medical Association of America, composed of the leading physicians of the country, has condemned its use in food. Then, if just as good products can be made without the use of benzoate as can be made with it, why use a product that is questionable and probably injurious to health? If benzoate is injurious to health, or even questionable, the question arises, then, why not prevent its use in food by law? The answer is this: If benzoate in food is not injurious to health, the State probably can not prevent its use. Today no man can say with certainty that it is or is not injurious to health. Manufacturers only who profit by its use have questioned the constitutional right of States to prohibit its use. The matter is now before the Federal courts to determine whether States have the power to prevent the use of benzoate or not.

"It is to be hoped that the matter will soon be settled by the courts. Until that time we can only warn the public of the possible danger and advise against the use of benzoate in food."

SUMMARY OF RESULTS FOR COMPARISON.

For convenience of comparison of the work for the eleven years, and to show at a glance the products which have been examined, and the extent of adulteration, misbranding and improper labeling of each, a summary of the results by year and by subject is given below.

SUMMARY OF WORK DONE BY YEAR.

1900. No. of samples examined, 507; per cent adulteration found, 56.0.
1901. No. of samples examined, 308; per cent adulteration found, 35.7.
1902. No. of samples examined, 589; per cent adulteration found, 21.3.
1903. No. of samples examined, 477; per cent adulteration found, 32.1.
1904. No. of samples examined, 347; per cent adulteration found, 17.0.
1905. No. of samples examined, 317; per cent adulteration found, 42.2.
1906. No. of samples examined, 466; per cent adulteration found, 24.7.
1907. No. of samples examined, 560; per cent adulteration found, 29.82.
1908. No. of samples examined, 730; per cent adulteration found, 16.45.
1909. No. of samples examined, 721; per cent adulteration found, 21.35.
1910. No. of samples examined, 1203; per cent adulteration found, 16.29.

Total number of samples examined since the law went into effect (1900), 6,225.

Average per cent of adulteration found, 23.91.

Name of Sample.	*Date.*	*Total No. Samples.*	*Per Cent Illegal.*
Baking Powders	1901	85	18.80
Baking Powders	1902	12	
Baking Powders	1906	64	1.50
Baking Powders	1908	7	2.56
Baking Powders	1909	39	
Baking Powders	1910	16	
Beers—1900, 1902, etc. See Malts.			
Beers and Imitation Beers	1907	50	6.00
Beers and Imitation Beers	1908	86	4.64
Beers and Imitation Beers	1909	40	10.00
Beers and Imitation Beers	1910	103	6.79
Breakfast Foods	1900	24	4.11
Breakfast Foods	1903	20	
Breakfast Foods	1904	39	
Breakfast Foods	1908	19	
Butter, Renovated Butter and Butterine	1900	11	
Butter, Renovated Butter and Butterine	1902	22	
Butter, Renovated Butter and Butterine	1904	15	
Butter, Renovated Butter and Butterine	1906	20	
Butter, Renovated Butter and Butterine	1908	10	20.00
Butter, Renovated Butter and Butterine	1909	54	18.51
Butter, Renovated Butter and Butterine	1910	16	25.00
Canned Fruit	1902	37	21.72
Canned Fruit	1904	96	42.98
Canned Fruit	1908	16	
Canned Fruit	1909	33	3.03

Name of Sample.	*Date.*	*Total No. Samples.*	*Per Cent Illegal.*
Canned Fish and Oysters	1904	53	1.88
Canned Meats	1904	33	39.39
Canned Vegetables	1900	225	33.46
Canned Vegetables	1902	81	11.60
Canned Vegetables	1904	47	27.10
Canned Vegetables	1905	29	
Canned Vegetables	1908	21	
Canned Vegetables	1909	16	
Canned Soups	1906	26	
Canned Soups	1907	4	
Catsups and Sauces	1900	43	91.61
Catsups and Sauces	1902	22	100.00
Catsups and Sauces	1903	49	100.00
Catsups and Sauces	1907	11	27.27
Catsups and Sauces	1908	4	25.00
Catsups and Sauces	1909	12	
Catsups and Sauces	1910	11	18.18
Ciders and Imitation Ciders	1900	3	100.00
Ciders and Imitation Ciders	1902	2	50.00
Ciders and Imitation Ciders	1903	1	100.00
Ciders and Imitation Ciders	1905	33	81.82
Ciders and Imitation Ciders	1908	40	27.50
Ciders and Imitation Ciders	1909	38	51.89
Ciders and Imitation Ciders	1910	6	
Cheese	1902	33	6.00
Cheese	1904	11	
Chocolate	1904	10	20.00
Cocoa	1904	14	
Coffee	1900	55	36.30
Coffee	1903	38	
Coffee and Coffee Substitutes	1907	6	33.33
Coffee and Coffee Substitutes	1910	57	
Coloring Matter	1907	7	
Coloring Matter	1908	12	
Condensed Milk	1907	16	
Condensed Milk	1909	2	50.00
Condiments	1901	44	20.40
Confectionery	1908	42	
Confectionery	1909	4	25.00
Corn Meal	1902	17	
Corn Meal	1903	23	
Corn Meal	1908	20	
Corn Meal	1909	23	
Corn Meal	1910	25	28.00
Cream of Tartar	1910	7	

Name of Sample.	Date.	Total No. Samples.	Per Cent Illegal.
Distilled Liquors	1903	3	
Distilled Liquors	1904	14	
Distilled Liquors	1906	28	
Distilled Liquors	1907	6	
Distilled Liquors	1908	30	6.66
Distilled Liquors	1909	7	
Distilled Liquors	1910	2	100.00
Dried and Evaporated Fruit	1906	23	30.44
Eggs	1910	9	88.88
Fish and Oysters, fresh	1906	14	7.15
Fish and Oysters, fresh	1907	5	40.00
Fish and Oysters, fresh	1908	7	
Fish and Oysters, fresh	1909	22	
Flour	1900	37	
Flour	1902	70	1.40
Flour	1903	77	
Flour	1904	59	
Flour	1908	68	
Flour	1909	222	5.40
Flour	1910	681	4.98
Fruit Butter, Plum	1901	5	100.00
Fruit Butter, Apple	1903	1	100.00
Fruit Butter	1907	6	100.00
Fruit Butter	1909	3	33.33
Fruit Juice	1900	4	75.00
Fruit Juice	1903	2	100.00
Fruit Juice	1909	4	25.00
Honey	1901	5	20.00
Honey	1903	6	33.30
Honey	1906	3	
Honey	1910	3	
Ice-cream and Ice-cream Substitutes	1909	45	80.00
Ice-cream and Ice-cream Substitutes	1910	89	77.03
Jams	1901	9	100.00
Jams	1903	14	78.40
Jams	1907	14	28.56
Jams	1908	3	
Jams	1909	10	30.00
Jellies	1901	10	100.00
Jellies	1903	14	76.60
Jellies	1907	50	48.00
Jellies	1908	12	
Jellies	1909	12	16.66
Lard	1900	11	9.00
Lard	1902	32	3.10
Lard	1910	1	
Lard, Compound	1902	24	

Name of Sample.	Date.	Total No. Samples.	Per Cent Illegal.
Lemon Extracts and Lemon Extract Substitutes..	1910	42	61.90
Malts, Beers, Ales, and Imitations.....	1900	30	80.00
Malts, Beers, Ales, and Imitations.....	1902	3	100.00
Malts, Beers, Ales, and Imitations.....	1903	14	86.00
Malts, Beers, Ales, and Imitations.....	1905	17	47.00
Malts, Beers, Ales, and Imitations.....	1906	91	31.68
Malts and Imitation Malts.....	1907	5	20.00
Maraschino Cherries	1907	8	100.00
Maraschino Cherries	1908	4	100.00
Maraschino Cherries	1909	10	10.00
Meats, fresh	1904	12	83.33
Meats, fresh	1906	107	47.66
Meats, fresh	1907	134	7.46
Meats, fresh	1908	13	7.69
Meats, fresh	1909	5	
Milk and Cream.....	1909	7	
Milk and Cream.....	1910	17	11.70
Mince-meat	1907	9	27.22
Miscellaneous	1908	21	18.20
Molasses and Sirup.....	1901	32	81.20
Molasses and Sirup.....	1903	11	37.50
Molasses and Sirup.....	1909	51	76.47
Molasses and Sirup.....	1910	47	4.25
Maple Sugar	1905	2	50.00
Maple Sirup	1905	15	86.66
Maple Sirup	1910	7	57.14
Marmalade	1903	3	
Olive Oil and other Table Oils.....	1900	11	18.18
Olive Oil and other Table Oils.....	1905	14	
Olive Oil and other Table Oils.....	1908	6	
Olive Oil and other Table and Cooking Oils.....	1909	7	14.28
Olive Oil and other Table and Cooking Oils.....	1910	9	
Phosphates	1902	6	100.00
Phosphates	1903	3	
Phosphates	1905	2	
Phosphates	1907	7	28.57
Phosphates	1908	3	66.66
Pickles	1907	6	66.66
Pickles	1909	5	
Prepared Mustard and Salad Dressings.....	1902	11	90.90
Prepared Mustard and Salad Dressings.....	1904	37	75.75
Prepared Mustard and Salad Dressings.....	1906	24	12.50
Preservatives, chemical	1907	31	
Preservatives, chemical	1908	4	
Preservatives, chemical	1910	1	

Name of Sample.	Date.	Total No. Samples.	Per Cent Illegal.
Preserves	1901	11	100.00
Preserves	1903	20	75.00
Preserves	1909	7	28.52
Preserves and Marmalades	1907	37	37.80
Preserves and Marmalades	1908	7	
Rice	1908	59	
Rice	1909	5	60.00
Sardines	1910	1	
Soda Waters, bottled	1900	33	72.72
Soda Waters, bottled	1902	36	72.00
Soda Waters, bottled	1903	20	25.00
Soda Waters, bottled	1906	7	43.00
Soda Waters, bottled	1907	54	61.05
Soda Waters, bottled	1908	144	54.86
Soda Waters, bottled	1909	11	54.54
Soda Waters, bottled	1910	51	33.33
Sugar, white	1901	19	
Sugar, brown	1903	16	
Sugar, white	1903	29	
Sugar, white	1910	2	
Sweeteners, Artificial	1908	5	
Tea	1901	25	
Tea	1903	21	33.33
Tea	1910	16	
Tapioca	1903	3	
Tonics and Bitters	1900	1	100.00
Tonics and Bitters	1902	3	33.33
Tonics and Bitters	1903	3	33.33
Tonics and Bitters	1905	14	7.14
Tonics and Bitters	1906	13	
Tonics	1907	4	
Tonics	1908	3	
Vinegar	1900	22	59.00
Vinegar	1901	13	30.70
Vinegar	1903	62	29.00
Vinegar	1905	52	34.61
Vinegar	1906	21	47.62
Vinegar	1907	39	30.72
Vinegar	1908	64	15.50
Vinegar	1909	27	48.14
Vinegar	1910	33	63.63
Whiskeys. See Distilled Liquors.			
Wines	1903	5	100.00
Wines	1905	1	100.00
Wines	1906	5	
Wines	1907	2	
Wines	1910	1	

WORK OF THE YEAR 1910.

During the year 1,203 samples of foods and beverages and products used in the manufacture and adulteration of the same have been analyzed. The samples were either sent to the Department by citizens of the State for analysis or were obtained by officers of the Department from various towns in the State.

SUMMARY OF RESULTS OF EXAMINATION OF FOOD PRODUCTS, 1910.

Name of Sample.	Total Number of Samples Examined.	Number of Samples Properly Branded, Labeled and not Adulterated.	Number of Samples not Properly Labeled.	Number of Samples Adulterated or Misbranded.	Per cent of Samples Illegal.
Baking Powders	16	15	1	.....	.....
Beers and imitation beers	103	96	.....	7	6.79
Butter, renovated butter and butterine	16	12	.....	4	25.00
Catsups and sauces	11	9	.....	2	18.18
Ciders and imitation ciders	6	6	.....	.....	.....
Coffee and coffee substitutes	57	57	.....	.....	.....
Corn meal	25	18	.....	7	28.00
Cream of tartar	7	7	.....	.....	.....
Distilled liquors	2	.....	.....	2	100.00
Eggs	9	1	.....	8	88.88
Flour*	631	556	.....	29	4.98
Honey	3	3	.....	.....	.....
Ice-cream and ice-cream substitutes	89	24	.....	65	73.03
Lard	1	1	.....	.....	.....
Lemon extracts and lemon extract substitutes	42	15	1	26	61.90
Milk and cream	17	15	.....	2	11.70
Molasses and sirups	47	44	1	2	4.25
Maple sirup	7	3	.....	4	57.14
Olive oil, table and cooking oils	9	6	3	.....	.....
Preservatives, chemical	1	1	.....	.....	.....
Sardines	1	1	.....	.....	.....
Soda-waters, bottled	51	.....	39	17	33.33

*Forty-six of the total number of samples were examined for experimental purposes, and are not considered in the calculation for adulteration.

SUMMARY OF RESULTS OF THE EXAMINATION OF PRODUCTS FOR 1910—CONTINUED.

Name of Sample.	Total Number of Samples Examined.	Number of Samples Properly Branded, Labeled and not Adulterated.	Number of Samples not Properly Labeled.	Number of Samples Adulterated or Misbranded.	Per cent of Samples Illegal.
Sugar, white	2	2			
Tea	16	16			
Vinegar	33	10	2	21	63.63
Wine	1	1			
Total	1,203	919	47	196	16.29

METHODS OF ANALYSIS.

The methods of analysis of the Association of Official Agricultural Chemists were followed in the examination of the products presented in this report.

BAKING POWDERS.

The aeration or leavening of breadstuffs by baking powders and yeast was treated at length in the Food Reports of this Department, published in 1902 and 1909. For information on the subject not found here, the reader is referred to those reports.

The leavening of bread products, whether by yeast or baking powder, is accomplished by an evolution through the mass of dough of carbon-dioxide gas, which in escaping makes the bread light and porous.

Baking powders are composed of a carbonate and an acid salt, and there are three classes in general use: tartrate powders, phosphate powders, and alum powders. The acid present in the first is tartaric acid, the acid in the second is phosphoric acid, and the acid in the third or alum powder is sulphuric acid. Carbon-dioxide gas is evolved in the dough by the chemical reaction of bicarbonate of soda with the cream of tartar, acid phosphate, alum, or other chemical, and leaves in the dough the non-volatile product of the reaction, consisting partly or wholly of mineral matter.

RESULTS OF THE EXAM-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8169	Baking Powder, Gold Medal.	The C. F. Ware Coffee Co., Dayton, Ohio.	Surles & Co., Dunn
8170	Baking Powder, King Kotton.		M. L. McRae, Maxton
8171	Baking Powder, Mascot	The C. F. Ware Coffee Co., Dayton, Ohio.	A. H. Caldwell, Charlotte
8172	Baking Powder, Sweetheart.	Southern Soda Works, Nashville, Tenn.	M. B. McDaniel, Rutherfordton
8173	Baking Powder, Rex	J. D. & R. S. Christian, Richmond, Va.	W. A. Mauney & Bro., Kings Mountain.
8174	Baking Powder, Cascade	American Pure Food Co., St. Louis, Mo.	Kiser & Mauney, Kings Mountain.
8175	Baking Powder, Mascot	The C. F. Ware Coffee Co., Dayton, Ohio.	J. L. Miller, Concord
8176	Baking Powder, Gattons Pride.	Consumer's Grocery Co., Roanoke, Va.	L. R. Winecoff, Salisbury
8177	Baking Powder, Luxury.	The C. F. Ware Coffee Co., Dayton, Ohio.	W. H. Moffitt, Lexington
8178	Baking Powder, Daily Bread.	The Heekin Spice Co., Cincinnati, Ohio.	
8179	Baking Powder, Donnell's.	Donnell Mfg. Co., St. Louis, Mo.	Buckingham & Co., Fayetteville.
8180	Baking Powder, Gold Medal.	The C. F. Ware Coffee Co., Dayton, Ohio.	C. G. Stephens, Lumberton
8181	Baking Powder, Southern.		McLaurin & Shaw, Laurinburg
8182	Baking Powder	Kenton Baking Powder Co., Cincinnati, Ohio.	J. A. Cecil, High Point
8183	Baking Powder, Ferndell	Sprague-Warner Co., Chicago, Ill.	V. W. Idol, High Point
8266	Baking Powder, Snow King.	Kenton Baking Powder Co., Cincinnati, Ohio.	

The value of a baking powder, so far as its leavening power is concerned, depends largely upon the amount of available carbon-dioxide present. If properly made any or all of them serve well the purpose for which they are intended, and it is only the residue left in the bread after baking that makes one class of powders more desirable than the others. Thus the most choice class of powders is the powder whose residue left in the bread is the least injurious to health. Baking powders should always be protected from the moisture in the air, for it causes deterioration of the powder.

Sixteen samples of powders were examined and no special adulteration was found, though Nos. 8172, 8173, 8176 and 8179 were very low in carbon-dioxide and therefore weak in leavening power, which was probably due largely to age. The sale of No. 8181 was illegal, because it was not properly labeled. The latter did not bear the name of the manufacturer or the acid ingredient present, and dealers are hereby warned against its sale.

INATION OF BAKING POWDERS.

Laboratory Number.	Carbon-dioxide—Per Cent Total.	Carbon-dioxide—Per Cent Residual.	Carbon-dioxide—Per Cent Available.	Results and Conclusions.
8169	9.79	1.33	8.43	Baking powder, alum phosphate.
8170	12.68	0.66	12.02	Baking powder, alum.
8171	8.75	0.83	7.92	Baking powder, alum phosphate.
8172	7.07	0.54	6.53	Baking powder, alum, with low leavening power.
8173	7.29	1.50	5.79	do.
8174	14.18	1.33	12.85	Baking powder, alum.
8175	10.28	1.20	9.08	Baking powder, alum phosphate.
8176	7.59	1.52	6.07	Baking powder, alum with low leavening power.
8177	17.65	2.06	15.59	Baking powder, alum phosphate.
8178	10.57	1.01	9.56	Baking powder, alum.
8179	5.44	2.74	2.70	Baking powder, alum phosphate, low leavening power; it should not be sold.
8180	13.10	1.00	12.10	Baking powder, alum phosphate.
8181	10.85	2.04	8.81	Baking powder, alum, not properly labeled. Does not show name of manufacturer or acid ingredients.
8182	8.09	2.96	6.03	Baking powder, alum.
8183	11.82	1.34	10.48	Baking powder, cream of tartar.
8266	16.16	0.80	15.36	Baking powder, alum.

BEERS AND IMITATION OR NEAR BEERS.

Malt liquor is a beverage made by the alcoholic fermentation of an infusion, in potable water, of barley malt and hops, with or without unmalted grains.

Beer is a malt liquor produced by bottom fermentation, and contains not less than 5.00 per cent of extractive matter and 0.16 per cent of ash, chiefly potassium phosphate, and not less than 2.75 per cent of alcohol by volume.

Lager beer is beer which has been stored in casks for a period not less than three months, and contains not less than 3.00 per cent of alcohol by volume.

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7168	Near Beer, Tonica	Indianapolis Brewing Co., Indianapolis, Ind.	B. S. Womble, Winston-Salem
7169	Near Beer	New South Brewing and Ice Co., Middlesboro, Ky.	J. H. Howell, Waynesville*
7170	---do	---do	---do
7171	---do	Wiedemann, New Port, Ky.	---do
7172	---do		---do
7173	---do	New South Brewing Co., Middlesboro, Ky.	---do
7174	Near Beer, Daisy	---do	---do
7175	Near Beer	---do	---do
7176	---do		---do
7177	---do		---do
7178	---do		C. D. Stroup, Four Oaks*
7179	---do		---do
7185	Near Beer, G. B. S.		Jno. W. Gullege, Wadesboro*
7186	Near Beer		---do
7340	Near Beer, Atlantis	The Red Rock Co., Atlanta, Ga.	J. G. Ball & Co., Raleigh
7343	Near Beer		F. Lang, Asheville
7344	---do	Jno. Hauck Brewing Co., Cincinnati, Ohio.	J. K. Boynton, Asheville
7345	---do		D. R. McKinnon, Asheville
7346	---do		O. K. Wainscott, Asheville.
7347	---do	Jno. Hauck Brewing Co., Cincinnati, Ohio.	W. H. Bush, Asheville
7351	Near Beer		Dr. A. J. Livermore, Scotland Neck.*
7352	---do		---do
7353	---do		---do

*Sent to the Department for analysis.

One hundred and three samples were examined, 75 of which proved to be beer and 28 imitation or near beer. Most of them were sent to the Department for analysis by county or city officials charged with the enforcement of the prohibition law. A few samples, however, were obtained by an officer of the Department under the food law, eight of which proved to be beers, though six of the eight were represented to be near beer, and were purchased as such. As the 6 samples were represented to be near beer and proved to be beer, it was regarded that they had been sold in violation of the food law, and the violations were reported to the courts for prosecution.

OF BEERS AND NEAR BEERS.

Laboratory Number.	Alcohol—Per Cent by Volume.	Solid Matter—Per Cent.	Adulterants.	Remarks and Conclusions.
7168	0.70		None found	Near beer.
7169	3.50		do	Beer.
7170	3.45		do	do.
7171	4.55		do	do.
7172	4.30		do	do.
7173	1.35		do	Near beer.
7174	1.85		do	do.
7175	4.30		do	Beer.
7176	3.72		do	do.
7177	3.12		do	do.
7178	1.65		do	Near beer.
7179	1.60		do	do.
7185	2.07		do	do.
7186	2.45		do	do.
7340	0.42		do	do.
7343	4.07	2.66	do	Beer; sale illegal.
7344	4.07	3.54	do	do.
7345	4.57	5.77	do	do.
7346	4.57	5.95	do	do.
7347	4.57	3.50	do	do.
7351	4.20		do	Beer.
7352	4.35		do	do.
7353	2.90		do	do

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7354	Near Beer		Dr. A. J. Livermore, Scotland Neck.*
7400	....do	Dukehart Mfg. Co., Baltimore, Md.	W. N. Everett, Mayor, Rockingham.*
7401	....do	Darley Park Brewery, Baltimore, Md.	J. E. Kerr, Lilesville *
7408	G. B. S. Special		Theo A. Hinnant, Wilson*
7409	....do		....do
7410	Near Beer		....do
7411	Near Beer, G. B. S. Special.	Gottlieb-Bauemschmidt Straus Brewery Co., Baltimore, Md.	....do
7412	Near Beer, Schlitz	Jos. Schlitz Brewing Co., Milwaukee, Wis.	....do
7413	Near Beer		....do
7414	Near Beer, Schlitz	Jos. Schlitz Brewing Co., Milwaukee, Wis.	....do
7415	Near Beer		....do
7416	....do		....do
7417	Near Beer, Schlitz	Jos. Schlitz Brewing Co., Milwaukee, Wis.	....do
7418	Near Beer		....do
7419	....do	Gottlieb Bauemschmidt Straus Brewing Co., Baltimore, Md.	....do
7420	....do		....do
7421	....do		....do
7423	Near Beer, Crescent Ale	Burr Mfg. Co., Richmond, Va.	W. C. Hammer, Ashboro*
7425	Near Beer, Buck Brew	A. M. Grady, Spray, N. C.	R. L. Davis, Wilson
7438	Near Beer		A. M. Talley, Asheville
7441	Near Beer, Dukehart's Beer.	Dukehart Brewery, Baltimore, Md.	Theo. A. Hinnant, Wilson*
7442	Near Beer		....do
7443	Near Beer, Tivoli		....do
7444	Near Beer		....do
7445	....do		....do
7446	....do		....do
7447	Near Beer, Anheuser-Busch.	M. J. Hessburg & Son, Richmond, Va.	....do
7448	Near Beer, G. B. S. Special.		....do
7449	Near Beer		....do
7450	Near Beer, Bock Bier		....do
7451	Near Beer, G. B. S. Special.		....do
7452	Near Beer		....do
7453	....do		....do
7454	....do		....do
7455	....do		....do
7456	....do		T. T. Thorne, Mayor, Rocky Mt.*

*Sent to the Department for analysis.

BEERS AND NEAR BEERS—*Continued.*

Laboratory Number.	Alcohol—Per Cent by Volume.	Solid Matter—Per Cent.	Adulterants.	Remarks and Conclusions.
7354	3.80		None found	Beer.
7400	1.97		do	Near beer.
7401	5.65	5.26	do	Beer.
7408	4.92		do	do.
7409	3.70		do	do.
7410	4.50		do	do.
7411	5.05		do	do.
7412	4.72		do	do.
7413	4.42		do	do.
7414	4.62		do	do.
7415	3.75		do	do.
7416	3.57		do	do.
7417	4.47		do	do.
7418	4.47		do	do.
7419	4.90		do	do.
7420	4.80		do	do.
7421	0.87		do	Near beer.
7423	3.15		do	Beer.
7425	2.00		do	Near beer.
7438	4.57	5.77	do	Beer.
7441	4.60	5.16	do	do.
7442	4.20	4.54	do	do.
7443	4.60	4.22	do	do.
7444	5.25	5.09	do	do.
7445	1.00	7.06	do	Near beer.
7446	4.45	5.23	do	Beer.
7447	4.45	5.55	do	do.
7448	5.25	5.75	do	do.
7449	5.35	5.13	do	do.
7450	4.10	7.79	do	do.
7451	3.50	5.91	do	do.
7452	5.67	5.06	do	do.
7453	4.75		do	do.
7454	4.70		do	do.
7455	3.82		do	do.
7456	4.62		do	do.

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7456	Near Beer		T. T. Thorne, Mayor, Rocky Mt.*
7458	---do		---do
7459	---do		---do
7460	---do		---do
7461	---do		---do
7462	---do		---do
7463	---do		---do
7464	---do		---do
7465	---do		---do
7467	---do		---do
7468	---do	Hoster's Columbus Brewing Co. Columbus, Ohio.	---do
7469	---do		---do
7470	Near Beer, Tidal Wave	Rosenegk Brewing Co., Richmond, Va.	---do
7471	Near Beer		W. C. Hammer, Ashboro*
7472	---do		---do
7473	---do		---do
7474	Palmetto Beer		---do
7475	---do		---do
7476	Near Beer, Pilsener Style	Virginia Brewing Co., Richmond, Va.	C. D. Thompson, Lincolnton
7490	Near Beer, Pabst		C. J. McCarthy, Mayor, New Bern*
7491	---do		---do*
7492	Near Beer		---do*
7493	---do		---do*
7494	---do		---do*
7495	Near Beer, Hop Brew	Home Brewing Co., Richmond, Va.	---do*
7496	Near Beer, Pabst Milwaukee.	Pabst Brewing Co., Milwaukee, Wis.	---do*
7497	Near Beer, Small Brew	Portner Malt Extract Co., Alexandria, Va.	---do*
7498	Near Beer		---do*
7532	---do		W. A. Watson, Fayetteville*
7533	---do		---do
7534	---do	J. Walker Brewing Co., Cincinnati. Ohio.	Messiek Grocery Co., Winston-Salem.*
7588	Near Beer, G. B. S.	Darley Park Brewing Co., Petersburg, Va.	Mills & Colson, Wadesboro.
7589	Near Beer, Beerine		G. C. Clark, Laurinburg
7590	Near Beer	Consumers Brewing Co., Norfolk, Va.	J. G. Barnes, Nashville
7591	Near Beer, Hop Ale	T. W. Parker, Laurinburg, N. C.	S. L. Perry, Laurinburg
7603	Near Beer		W. A. Watson, Fayetteville*

*Sent to the Department for analysis.

BEERS AND NEAR BEERS—*Continued.*

Laboratory Number.	Alcohol—Per Cent by Volume.	Solid Matter—Per Cent.	Adulterants.	Remarks and Conclusions.
7456a	3.75		None found	Beer.
7458	4.65		do	do.
7459	4.37		do	do.
7460	4.07		do	do.
7461	1.37		do	Near beer.
7462	1.97		do	do.
7463	4.00	5.27	do	Beer.
7464	4.27	5.98	do	do.
7465	1.60	6.47	do	Near beer
7467	2.50	5.59	do	do.
7468	0.30	6.58	do	do.
7469	4.50	3.83	do	Beer.
7470	1.85	4.73	do	Near beer.
7471	3.97	5.59	do	Beer.
7472	1.15	6.82	do	Near beer.
7473	5.02	5.72	do	Beer.
7474	4.10	5.45	do	do.
7475	4.17	4.65	do	do.
7476	4.60		do	do.
7490	3.62		do	do.
7491	3.62		do	do.
7492	3.82		do	do.
7493	3.62		do	do.
7494	4.65		do	do.
7495	2.07		do	Near beer.
7496	1.57		do	do.
7497	1.85		do	do.
7498	4.27		do	Beer.
7532	2.05		do	Near beer.
7533	4.30		do	Beer.
7534	0.47		do	Near beer.
7588	1.57		do	do.
7589	0.47		do	do.
7590	4.32		do	Beer; sale illegal.
7591	0.22		do	Near beer.
7603	2.05		do	do.

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7404	Near Beer, Zizz	Baltimore Bottling Co., Baltimore, Md.	D. D. Wilkins, Shelby*
7405	Near Beer, Crescent	Southern Bottling Co., Baltimore, Md.	----do
7637	Near Beer, Imperial		Roland Dockery, Murphy
7638	----do	Chattanooga Brewing Co., Chattanooga, Tenn.	King & Hughes, Murphy
8075	----do		King, Hughes & Doekery, Murphy
8076	----do		Sam Voiles, Murphy
8344	----do	Consumers Brewing Co., Norfolk, Va.	W. E. Boone, Richlands*
8345	Near Beer, Pabst		----do

*Sent to the Department for analysis.

BUTTER AND BUTTER SUBSTITUTES.

Butter is the clean, nonrancid product made by gathering in any manner the fat of fresh or ripened milk or cream into a mass, which also contains a small portion of the other milk constituents, with or without salt, and contains not less than 82.50 per cent of milk fat.

Renovated butter, process butter, is the product made by melting butter and working, without the addition or use of chemicals or any substance except milk, cream or salt, and contains at least 82.50 per cent of milk fat and not more than 16 per cent of water.

Oleomargarine, oleo or butterine is a substitute for butter, made from other and cheaper fats than butter. It is manufactured so as to improve its granulation and texture, and a more or less butter-like flavor and odor are imparted to it by churning it with milk, skim-milk, cream or buttermilk, or, possibly, by mixing a small amount of butter with it.

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7116	Butter	Carolina Butter and Egg Co., Asheville, N. C.	Noland & McIntyre, Asheville
7117	Butter, compound	----do	Stradley & Luther, Asheville
7119	Butter	----do	R. W. Harkins Co., Asheville
7120	----do	----do	Felmet Bros., Asheville
7350	----do	Culp & McNealy, Mooresville, N. C.	

BEERS AND NEAR BEERS—*Continued.*

Laboratory Number.	Alcohol—Per Cent by Volume.	Solid Matter—Per Cent.	Adulterants.	Remarks and Conclusions.
7404	2.82		None found	Beer.
7405	4.55		do	do.
7637	5.32		do	Beer; sale illegal.
7638	3.75		do	do.
8075	3.97		do	do.
8076	3.95		do	do.
8344	3.87		do	Beer.
8345	4.07		do	do.

Sixteen samples of butter and butter substitutes were examined, three of which were found to be adulterated and sold in violation of the food law. They contained fats other than milk fat, as will be seen by reference to the table below. One sample proved to be a compound butter and another a renovated butter, but they were sold as such, so the law was not violated. By reference to the table below it will be seen that the law was violated in the sale of 6 samples because of short weight, the packages having been sold for one pound packages when in fact the actual weight was only from 10 to 14 ounces each. This is a form of violation that appears to be very prevalent, and the attention of dealers is hereby called to the violation of the law by the sale of short weight packages, and in the future such violations will be prosecuted.

BUTTER AND BUTTER SUBSTITUTES.

Laboratory Number.	Reading Refractometer, 40°C.	Refractive Index.	Volatile Fatty Acid or Reichert-meissl No.	Adulterants.	Remarks and Conclusions.
7116	50.00	1.4593	7.08	Fat other than butter fat; cotton-seed oil.	Butter, adulterated and misbranded.
7117	51.00	1.4600	6.50	do	Compound butter.
7119	50.50	1.4596	7.02	do	Butter, adulterated and misbranded.
7120	49.50	1.4590	7.20	do	do.
7350	44.00			Water, 20.77 per cent	Butter, package short weight; contained too large a per cent of water.

RESULTS OF THE EXAMINATION OF BUTTER

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7402	Butter		E. Hillman, Aberdeen*
7621	Butter, renovated		Dr. F. W. Ritter, Moyock*
8041	Butter		D. L. Ward, Franklinton*
8188	....do		Chas. E. Pugh, Greensboro
8189	....do	Kingan & Co., Richmond, Va.	C. Scott, Greensboro
8190	....do		Hudson Grocery Co., Greensboro
8191	....do		W. T. Stockwell, Greensboro
8192	....do	Fox River Butter Co., Aurora, Ill.	Patterson Bros. Co., Greensboro
8247	....do		M. Paul & Co., Charlotte
8248	Butter, Fox River	Fox River Butter Co., Aurora, Ill.	Miller-Van Ness Co., Charlotte
8249	Butter, Elgin	Stanley Creamery Co., Stanley, N. C.	Bridgers Co., Charlotte

*Sent to the Department for analysis.

CATSUPS AND SAUCES.

While tomato catsup is probably the most popular of all such condiments, there are many other catsups and sauces on the market. Formerly most of these condiments were artificially colored with bright-colored coal-tar dyes and preserved with chemical preservatives. As has been stated before, there is possibly some excuse for the use of chemical preservatives in this class of products, but there can be none for the use of the coal-tar dyes, and since they have been so severely condemned their use has to a large extent disappeared. Most high class manufacturers have discontinued the use of both the coal-tar dye and the chemical preservative. It is, however, still

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8376	Catsup, Tomato, Empire.	Empire Manufacturing Co., Detroit, Mich.	L. N. Presson, Monroe
8379	Catsup, Tomato, Ferndell.	Sprague, Warner Co., Chicago, Ill.	Miller-Van Ness Co., Charlotte
8381	Sauce, Red Snapper	Red Snapper Sauce Co., Memphis, Tenn.	Mullis & Co., Charlotte
8378	Catsup	The Hyman Pickle Co., Louisville, Ky.	Hunter & Boyd, Charlotte
8380	Sauce	Bishop & Co., Los Angeles, Cal.	Miller-Van Ness Co., Charlotte
8382	Catsup	P. J. Ritter Conserve Co., Philadelphia, Pa.	Wampum Store, Lincolnton

AND BUTTER SUBSTITUTES—*Continued.*

Laboratory Number.	Reading Refractometer, 40°C.	Refractive Index.	Volatile Fatty Acid or Reichert-meissl No.	Adulterants.	Remarks and Conclusions.
7402	43.50	1.4550		None found	Butter, poor quality.
7621	42.50			do	Renovated butter.
8041	44.00				Butter, rancid by age.
8188	41.50				Butter, package short weight.
8189	43.50			None found	Butter.
8190	43.50				Butter, package short weight.
8191	41.00			Water	Butter, weight little short, water present little high.
8192	44.50				do.
8247	41.00				do.
8248	43.00			None found	Butter.
8249	42.00			do	do.

claimed by some of the medium and lower class manufacturers that they can make a better product with the use of a chemical preservative than without, but their claim is not borne out by the facts in the case.

When the fact is plainly stated on the label no objection is made to the use of 0.2 per cent of benzoate of soda in tomato catsup.

Sample No. 8383, made by the Horton Cato Manufacturing Company, was found to contain benzoate without the presence of the latter being stated on the label. The sale of the product was a violation of the law and dealers are hereby warned that such violations will be prosecuted in the courts.

OF CATSUPS AND SAUCES.

Laboratory Number.	Chemical Perservatives.	Remarks and Conclusions.
8376	Benzoate	Tomato catsup.
8379	None found	do.
8381	do	Sauce.
8378	Benzoate	Catsup.
8380	None found	Sauce.
8382	Benzoate	Catsup.

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis
8383	Catsup, Muscatel	The Horton Cato Mfg. Co., Detroit, Mich.	L. R. Winecoff, Salisbury
8384	Catsup, Mexican Chili	do	do
8385	Catsup, Blue Label	Curtice Bros. Co., Rochester, N.Y.	Caldwell & Carlisle, Lumberton
8386	Catsup, Golden Horse Shoe.	The Four Co., Norfolk, Va.	
8387	Catsup, Tomato	Virginia Pure Food Co., Baltimore, Md.	

CIDER AND IMITATION CIDERS.

Cider is a product made by the normal alcoholic fermentation of apple juice, and the usual cellar treatment, and contains not more than 7 per cent of alcohol by volume, not less than 2 per cent and not more than 12 per cent of solids, not more than 8 per cent of reducing sugars, and not less than 0.2 per cent nor more than 0.4 per cent of cider ash.

Cider, to comply with the North Carolina Food Law, must be made entirely of unadulterated apple juice. A product made from the juice of any other fruit than apples, if offered for sale, must bear the name of the fruit from which it is made. If artificial color or

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7406	Cider, Imitation		Sheriff D. D. Wilkins, Shelby*
7407	do		do
7424	do		E. W. Ayers, Washington*
7466	do		I. N. Glover, Bailey*
7538	do	Anderson Co., Atlanta, Ga.	Foy Autry, Autryville*
8316	do		W. S. Bosfield, Dallas*

*Sent to the Department for analysis.

COFFEE AND COFFEE SUBSTITUTES.

Coffee is the seed of a small tree, coffea, whose fleshy fruit is about the size of a small cherry, and contains two seeds joined on their flat sides, which when freed from the pulp and the enveloping membrane are the coffee beans of commerce.

CATSUPS AND SAUCES—*Continued.*

Laboratory Number.	Chemical Preservatives.	Remarks and Conclusions.
8383	Benzoate	Catsup, preservative not stated on label; sale illegal.
8384	do	do.
8385	do	Catsup.
8386	do	do.
8387	do	Catsup, tomato.

flavor is added the fact must be stated on the label, and the product must be sold as a compound or an imitation cider, otherwise it will be classed as adulterated or misbranded and the sale prohibited.

There are a large number of imitation ciders on the market, presumably made from fruit extracts, but which are made from chemical flavors. A pure fruit juice or cider is a wholesome beverage, but the imitation products are usually objectionable and should not be used.

Six samples of these products were examined, all belonging to the imitation class. They can hardly be regarded as adulterated, for, as has been stated before, the product itself is, in most cases, as worthless as any material that could be added to them.

OF CIDERS AND IMITATION CIDERS.

Laboratory Number.	Alcohol—Per Cent by Volume.	Solid Matter in Solution—Per Cent.	Adulterants.	Remarks and Conclusions.
7406	2.92		None found	Imitation cider.
7407	2.02		do	do.
7424	5.65		do	do.
7466	0.50		do	do.
7538	0.00		Benzoate	do.
8316	8.85		None found	do.

Roasted coffee is coffee which by the action of heat has become brown and developed its characteristic aroma, and contains not less than 10 per cent of fat and 3 per cent of ash.

The principal action or stimulating constituent of coffee is caffeine, a white, bitter crystallizable substance.

The principal material which is used to mix with and adulterate coffee is chicory, though the roasted roots of dandelions, beets and carrots, as well as many cereals and leguminous seeds, such as wheat, rye, barley, beans and peas are often used. Attempts have been made to imitate the coffee bean, but it has been a failure, and the only successful adulteration is the addition of a substitute to the ground product. The consuming public is therefore cautioned regarding the purchase of ground coffee.

There are a great many brands of so-called coffee on the market that contain from 20 to 60 per cent of chicory. The manufacturers of these products generally claim that the chicory is added not to adulterate, but to actually improve the quality and strength of the coffee. This claim does not seem to be well founded, and is misleading to the public. Chicory, when roasted, contains a large amount of caromel and other soluble matter that imparts to the product, when made into a liquid for use as a beverage, a black, thick, soup-like appearance. The effect produced in coffee by the presence of chicory can no more correctly be regarded as adding strength to the coffee than if so much roasted starch and caromel had been added to it. Chicory is not added to coffee to give it strength, but to cheapen the product. The cost of chicory ranges from about one-fourth to one-eighth of the cost of coffee, depending upon the quality of both.

The State food law provides that a product is adulterated:

1. If any substance has been mixed or packed with it so as to reduce or lower its quality or strength.

2. If any substance has been substituted wholly or in part for the article.

Under the law the addition of anything to coffee that reduces or lowers its strength or value is an adulterant. The addition of chicory to coffee reduces or lowers its quality and strength and is,

RESULTS OF THE EXAMINATION OF COFFEE AND

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
5773	Coffee, White House	Dwinell-Wright Co., Boston, Mass.	S. R. Lentz, Charlotte
5774	Coffee, Private Estate	F. A. Cachois & Co., New York, N. Y.	do
5779	Coffee	Sprague-Warner Co., Chicago, Ill.	do
5782	Coffee, Superior	Chase & Sanborn, Boston, Mass.	Miller-Van Ness Co., Charlotte
5793	do	do	C. W. Padderson, Mount Airy
5797	Coffee, Star	Dannemiller & Co., Canton, O.	Gaddy & Troy, Concord
5799	Coffee, 5-A	Bonsal Coffee Co., Baltimore, Md.	D. J. Bost Co., Concord

therefore, an adulterant. The law, however, provides that if the fact of its presence in the coffee is stated on the label, the sale is not illegal. Chicory, cereals, or legumes added to coffee reduces and lowers the value of the coffee, and a product containing one-fourth or one-half chicory, etc., is worth practically one-fourth or one-half less than an equal amount of the same coffee. Then why buy coffee and chicory or coffee and cereals at the price of coffee? The sale of coffee and chicory as such is legal under the law, but why pay the price of coffee for a product that is worth much less than coffee?

It is advisable to buy the unground coffee and have it ground, then you know that you are getting what you buy.

Under the head of coffee and coffee substitutes 57 samples were examined, 23 of which were unground roasted coffees, and 34 were ground. Of the 34 ground samples 8 of them contained chicory or cereals in amounts ranging from 20 to 60 per cent. Because the roasted or parched chicory and cereals, containing a large amount of coloring matter, impart a black and soup-like appearance to the product, manufacturers who use them in their coffee claim that they give strength to it. From the best information on the subject this claim is untrue, and the chicory and cereals are added only to cheapen the product and enlarge the manufacturer's profits.

Sample No. 7580, a compound of chicory and cereals with coffee, is offered for sale under what the manufacturer terms a trade or proprietary name, "Money Saver." These words appear to be misleading. The State Food Law provides that a product is deemed to be misbranded if the label bears any statement that is untrue or misleading in any particular. From the composition and price of this article it would appear that the words "Money Saver" are misleading, and if so the product is misbranded. However, the public is cautioned that this product is not coffee and can not be offered for sale as such.

COFFEE SUBSTITUTES, ROASTED AND GROUND.

Laboratory Number.	Adulterants	Remarks and Conclusions.
5773	None found	Coffee, roasted.
5774	---do	do.
5779	---do	do.
5782	---do	do.
5793	---do	do.
5797	---do	do.
5799	---do	do.

RESULTS OF THE EXAMINATION OF COFFEE AND

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
5801	Coffee, Our Special	North State Coffee Co., Charlotte, N. C.	D. J. Bost Co., Concord
5803	Coffee, Madja	Jas. Heekin Co., Cincinnati, O.	T. F. Young & Co., Salisbury
5804	Coffee, Our Own	L. R. Winecoff, Salisbury, N. C.	L. R. Winecoff, Salisbury
5806	Coffee, Big Ten	Imperial Coffee Co., Richmond, Va.	J. W. Isler, Goldsboro
5809	Coffee, Red Seal	T. R. Lamm, Wilson, N. C.	T. R. Lamm, Wilson
6386	Coffee, Bonsal's Golden Rio.	Bonsal Coffee Co., Baltimore, Md.	H. L. Parks, Concord
6387	Coffee, Our Favorite	Blume & Linkes, Concord, N. C.	Chas. H. A. Blume, Concord
6383	Coffee, Shield	Aragon Coffee Co., Richmond, Va.	Gaddy & Troy, Concord
6385	Coffee, Aragon	----do	----do
6389	Coffee, Cracker Jack	Imperial Coffee Co., Richmond, Va.	Hardison Co., Wadesboro
6394	Coffee, Mitchell's Favorite.	E. A. Saunders' Sons Co., Richmond, Va.	J. F. Allen, Wadesboro
6396	Coffee	Chase & Sanborn, Boston, Mass.	H. C. Watson, Rockingham
6397	Coffee, Nabob	F. H. Leggett & Co., New York City.	W. P. McLean, Statesville
7440	Coffee, Ariosa	Arbuckle Bros., New York City	Rudy & Buffaloe, Raleigh
7579	Coffee, Dandy Cup	Snider-Raney Co., Salisbury, N. C.	H. Z. White, Salisbury
5775	Coffee, ground, B. B. Blend.	Bennett, Sloan & Co., New York	S. R. Lentz, Charlotte
5776	Coffee, ground, Fortune Teller.	James Heckin Co., Cincinnati, O.	J. F. Jamison, Charlotte
5777	Coffee, ground, Excelsior	Dwinell-Wright Co., Boston, Mass.	----do
5778	Coffee, ground, Autocrat.	Brownell & Field Co., Providence, R. I.	----do
5781	Coffee, ground, Laguayra	L. L. Sarratt, Charlotte, N. C.	L. L. Sarratt, Charlotte
5789	Coffee, ground, Our Leader.	A. P. Grizzard, Winston-Salem, N. C.	A. P. Grizzard, Winston-Salem
5790	Coffee, ground, Jackson Square.	Importers Coffee Co., New Orleans, La.	T. F. Satterfield, Mount Airy
5792	Coffee, ground, Morara	C. W. Antrim & Son, Richmond, Va.	F. M. Poore, Mount Airy
5794	Coffee, ground, Barrington-Hall.	Baker Importing Co., New York City.	E. W. Padderson, Mount Airy
5807	Coffee, ground, Caraja	Dwinell-Wright Co., Boston, Mass.	Kinston Peanut Co., Kinston
6392	Coffee and Chicory, ground, The Boss.	The Reilly-Taylor Co., New Orleans, La.	J. F. Allen, Wadesboro
6393	Coffee and Chicory, ground, Ten Cent.	Aragon Coffee Co., Richmond, Va.	----do
7499	Coffee and Chicory, ground, Jarvina.	Aragon Coffee Co., Manchester, Va.	P. Remington, Southwood
7565	Coffee, ground, Golden Blend.	Elmond M. Tart, Dunn, N. C.	Elmond M. Tart, Dunn
7566	Coffee, ground, Electric	Imperial Coffee Co., Richmond, Va.	Barnes & Giddens, Dunn
7567	Coffee, ground, Carolina Blend.	Hall & Bass, Norfolk, Va.	A. S. Melvin Co., Fayetteville
7568	Coffee, ground, Sarico	Englehardt & Sons, Louisville, Ky.	W. W. McArthur, Lumberton
7569	Coffee, ground, Tumbler	Imperial Coffee Co., Richmond, Va.	McNair & Stagner, Rockingham
7571	Coffee, ground, Hygeia	Merchant's Coffee Co., Baltimore, Md.	J. H. Tice, Wadesboro
7572	Coffee, ground, Boyd's	W. C. Boyd & Co., Richmond, Va.	V. F. Tarleton, Wadesboro
7574	Coffee, ground	North State Coffee Co., Charlotte, N. C.	Hunter & Boyd, Charlotte

COFFEE SUBSTITUTES, ROASTED AND GROUND—*Continued.*

Laboratory Number.	Adulterants.	Remarks and Conditions
5801	None found	Coffee, roasted.
5803	....do	do.
5804	....do	do.
5806	....do	Coffee, roasted and glazed; the fact was stated on label
5809	....do	Coffee, roasted.
6386	....do	do.
6387	....do	do.
6383	....do	do.
6385	....do	do.
6389	....do	do.
6394	....do	do.
6396	....do	do.
6397	....do	do.
7440	....do	Coffee, roasted and glazed; the fact was stated on label
7579	....do	do.
5775	....do	Coffee, ground.
5776	....do	do.
5777	....do	do.
5778	....do	do.
5781	....do	do.
5789	....do	do.
5790	....do	do.
5792	....do	do.
5794	....do	do.
5807	....do	do.
6392		Coffee and chicory, ground; the chicory tends to lower the value of the product.
6393		Coffee and chicory, ground; the chicory tends to lower the value of the product and label bore misleading statements regarding the use of the chicory.
7499		do.
7565	None found	Coffee, ground.
7566	....do	do.
7567	....do	do.
7568	....do	do.
7569	....do	do.
7571	....do	do.
7572	....do	do.
7574	....do	do.

RESULTS OF THE EXAMINATION OF COFFEE AND

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7575	Coffee, ground, French Breakfast.	North State Coffee Co., Charlotte, N. C.	J. F. Jamison, Charlotte
7576	Coffee, ground, Square Deal.	Bridgers & Co., Charlotte, N. C.	Bridgers & Co., Charlotte
7578	Coffee, ground		McGill Bros. & Co., Kings Mountain.
7581	Coffee, ground, The Hosts Blend.	F. A. Cachois & Co., Norfolk, Va.	J. M. Hendricks, High Point
5780	Coffee, ground, Tourist	Levering Coffee Co., Baltimore, Md.	L. L. Sarratt, Charlotte
7582	Coffee and Chicory, ground, Old '76.	Importer's Coffee Co., New Orleans, La.	A. L. Tew, Fayetteville
7583	Coffee, ground, Lucky Find.	Levering Coffee Co., Baltimore, Md.	Caldwell & Carlyle, Lumberton
7584	Coffee, ground, Kuester's	Kuester-Pharr Co., Charlotte, N.C.	W. D. Wright, Laurinburg
7586	Coffee and Chicory, ground, Dannemillers.	Dannemiller Coffee Co., Brooklyn, N. Y.	H. O. Covington, Laurinburg
7587	Coffee and Chicory, ground, One Dime.	Covington & Hammond, Laurinburg, N. C.	G. J. Jacobs, Laurinburg
8216	Coffee and Chicory, gr'd, Dannemiller, 10c.	Dannemiller Coffee Co., Brooklyn, N. Y.	Frank Jessup, Red Springs
7580	Coffee, Money Saver	Aragon Coffee Co., Manchester, Va.	M. C. Walter, Concord
7577	Coffee, Kenney's, ground	C. D. Kenney	C. D. Shelby, Charlotte
6388	Coffee, roasted	The Hardison Co., Wadesboro, N. C.	Hardison Co., Wadesboro

CORN MEAL.

Corn meal, maize meal, is meal made from sound maize grain or Indian corn and contains not more than 14 per cent of moisture, not less than 1.12 per cent of nitrogen, and not more than 1.6 per cent of ash.

As corn meal is one of the cheapest food products available there is but little inducement to adulterate it, and it is rarely adulterated except by deterioration and thereby becoming unfit for food. A

RESULTS OF THE EXAM

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer o rParty Who Sent Sample for Analysis.
7244	Corn Meal	Jno. W. Poole & Son, Petersburg, Va.	Cobb & Johnson, Kinston
7272	do	Newport Mill Co., Newport, Tenn.	Major Hopper, Shelby
7277	Corn Meal, Old Fashion	Acme Milling Co., Talbot, Tenn.	W. J. Arey, Shelby
7286	Corn Meal	Salisbury Milling Co., Salisbury, N. C.	Peeler Grain and Provision Co., Salisbury.
7301	do	J. W. Poole & Son, Petersburg, Va.	Hales & Edward, Rocky Mount

COFFEE SUBSTITUTES, ROASTED AND GROUND—*Continued.*

Laboratory Number.	Adulterants	Remarks and Conclusions
7575	None found	Coffee, ground
7576	....do	do.
7578	....do	Coffee, ground; the label should show name and address of manufacturer.
7581	....do	Coffee, ground.
5780	....do	do.
7582		Coffee and chicory; contained very large amount of chicory which lowers the value of the product.
7583	None found	Coffee, ground.
7584	....do	do.
7586		Coffee and chicory; contained very large amount of chicory which lowered the value of product; statement on label misleading.
7587		Coffee and chicory; chicory present lowered value of product.
8216		Coffee and chicory; chicory present lowered value of product, directions on label misleading.
7580		Coffee, chicory and cereal.
7577	None found	Coffee; not properly labeled, does not bear name and address of manufacturer.
6388		Coffee, roasted.

product is deemed to be adulterated if it consists in whole or in part of a decomposed or putrid animal or vegetable substance.

Twenty-five samples of meal were examined, 7 of which had deteriorated and were unfit for food. The product in each case was seized and the sale as human food prevented. As the dealers earnestly claimed that they were unaware that the meal had spoiled, no prosecutions were recommended, but dealers are hereby cautioned that violations of the law by the sale of spoiled meal will, in the future, be prosecuted.

INATION OF CORN MEAL.

Laboratory Number.	Ash—Per Cent.	Adulterants.	Remarks and Conclusions.
7244	1.16	None found	Corn Meal.
7272	1.21	....do	do.
7277	1.27	....do	do.
7286	1.15	....do	do.
7301	1.20	....do	do.

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7305	Corn Meal	Seaboard Feed and Produce Co., Henderson, N. C.	Sterling Cotton Mills, Franklinton.
7306	....do	Milton Mill Co., Milton, N. C.	Hutcheson Bros., Reidsville
7307	....do	J. I. Pritchett & Co., Lynchburg, Va.	Cromess Bros., Winston-Salem
7308	....do	Isaac Shore, Yadkinville, N. C.	Isaac Shore, Yadkinville
7309	Corn Meal, Pearl Meal	B. D. Booth & Co., Petersburg, Va.	Best & Thompson, Goldsboro
7310	Corn Meal, Seaboard	Seaboard Feed and Produce Co., Henderson, N. C.	H. D. Baldwin, Rockingham
7311	Corn Meal	Statesville Flour Mill Co., Statesville, N. C.	A. W. Poster, Rockingham
7312	Corn Meal, Old Style	Atlanta Milling Co., Atlanta, Ga.	W. F. Redmond, Charlotte
7313	Corn Meal	Statesville Flour Mill Co., Statesville, N. C.	Chambers & Moody, Charlotte
7314	....do	Acme Milling Co., Talbot, Tenn.	Gaston & Tate, Marion
7315	Corn Meal, Scroto	Scroto Hominy Co., Portsmouth, Va.	E. F. Jennette, Washington
7316	Corn Meal, Extra	High Point Milling Co., High Point, N. C.	P. H. Johnson, High Point
7341	Corn Meal, Old Style	Raleigh Milling Co., Raleigh, N. C.	M. Rosenthal & Co., Raleigh
8162	Corn Meal	Seaboard Feed and Produce Co., Henderson, N. C.	E. H. Lawrence & Co., Durham
8163	....do	J. I. Pritchett, Danville, Va.	Scott-Sparger Co., Greensboro
8164	....do		Baker-Bizzell Co., Goldsboro
8165	....do	B. D. Booth & Co., Petersburg, Va.	J. T. Ginn, Goldsboro
8166	....do		Wilson Grocery Co., Wilson
8167	Corn Meal, White Pearl	B. D. Booth & Co., Petersburg, Va.	The C. Woodard Co., Wilson
8168	Corn Meal	....do	R. E. Pipkin, Wilson

CREAM OF TARTAR.

Cream of tartar, acid potassium tartrate, is a white crystalline powder obtained from the crude cream of tartar which is deposited during the fermentation of grape juice, and from the lees of wine. This acid tartrate is the principal acid in grape juice, and remains in solution until the sugar in the juice is converted by fermentation

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8287	Cream of Tartar	Austin Nichols, New York, N. Y.	L. H. Caldwell, Lumberton
8288	....do	E. R. Durkees & Co., New York, N. Y.	W. T. Williams, Rockingham
8289	....do	Dwinell-Wright Co., Boston, Mass.	S. H. Youngblood, Charlotte

OF CORN MEAL—*Continued.*

Laboratory Number.	Ash—Per Cent.	Adulterants.	Remarks and Conclusions
7305	1.28	None found	Corn Meal
7306	1.24	....do	do.
7307	1.10	....do	do.
7308	1.24	....do	do.
7309	1.27	....do	do.
7310	1.23	....do	do.
7311	1.30	....do	do.
7312	1.17	....do	do.
7313	1.25	....do	do.
7314	1.04	....do	do.
7315	1.28	....do	do.
7316	1.20	....do	do.
7341	1.26	....do	do.
8162	.....	Spoiled	Withdrawn from sale on account of short weight and condition.
8163	.....	....do	do.
8164	.....	....do	do.
8165	.....	....do	do.
8166	.....	....do	do.
8167	.....	....do	do.
8168	.....	....do	do.

into alcohol, in which it is insoluble, when it is precipitated in an impure form.

Cream of tartar is largely used in medicine as well as in the manufacture of baking powders.

Seven samples of cream of tartar were examined and no adulteration was found.

TION OF CREAM OF TARTAR.

Laboratory Number.	Cream of Tartar—Per Cent.	Remarks and Conclusions.
8287	99.68	Cream of Tartar.
8288	99.72	do.
8289	99.72	do.

RESULTS OF THE EXAMINATION

	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8290	Cream of Tartar	C. W. Antrim & Sons, Richmond, Va.	R. M. Twitty, Rutherfordton
8291	....do	Powers-Taylor Drug Co., Fayetteville, N. C.	A. J. Cooke, Fayetteville
8292	....do		L. C. Wooten, Fayetteville
8293	....do	The Frank Tea and Spice Co., Cincinnati, Ohio.	M. A. Bethune, Fayetteville

EGGS.

Eggs are one of the most important and choice food products of the country. When fresh they are rich and nourishing, and when properly prepared very digestible. Their use is too well known to be commented on here. Used as they generally are it would appear that eggs could not be adulterated, but the law provides that a food product is deemed to be adulterated if it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance unfit for food, whether manufactured or not.

A food product is deemed to be misbranded if any statement is made on the label or otherwise that is deceptive or misleading to the purchaser. The sale of spoiled or decomposed eggs is a violation of the law. If eggs are represented by the dealer to be fresh when they are not fresh, the sale is a violation of the law.

RESULTS OF THE EX-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8321	Eggs, Fresh		Reformers Store, Raleigh
8322	....do		W. R. Dorsett, Raleigh
8323	Eggs		M. Rosenthal, Raleigh
8324	Eggs, Fresh		J. F. Caln, Raleigh
8325	....do		H. J. Johnson, Raleigh
8326	....do		W. B. Mann Co., Raleigh
8327	....do		A. S. Womble, Raleigh
8328	....do		L. A. Perry, Raleigh
8329	....do		A. B. Blake, Raleigh

OF CREAM OF TARTAR—*Continued.*

Laboratory Number.	Cream of Tartar—Per Cent.	Remarks and Conclusions
8290	99.68	Cream of tartar.
8291	99.28	do.
8292	99.72	do.
8293	99.68	do.

Nine samples of eggs (6 eggs to the sample) were examined, 8 of which were represented to be fresh eggs and one not fresh. By reference to the table below, it will be seen that every sample contained one or more eggs that were not fresh, and two of the samples contained eggs that were so badly spoiled that when broken they were very offensive. So in every case where the eggs were represented to be fresh the law was violated.

As this is the first examination under the law no prosecution has been recommended for these offenses, but dealers are hereby cautioned that the sale of spoiled eggs or misrepresentations in the sale of the same will be regarded as a violation of the law and will be prosecuted.

AMINATION OF EGGS.

Laboratory Number.	Six Eggs to Sample In 10 per cent Salt Solution.	Remarks and Conclusions.
8321	6 floated	Eggs in fair condition, were not fresh as represented to be, sale was illegal.
8322	---do	do.
8323	5 floated, 1 sank	Eggs in fair condition only, were not represented to be fresh.
8324	3 floated, 3 sank	Eggs, three fresh, three not fresh as represented, sale was illegal.
8325	5 floated, 1 sank	Eggs, one fresh, five not fresh as represented, sale was illegal.
8326	6 floated	Eggs in fair condition only, not fresh as represented to be, sale was illegal.
8327	---do	do.
8328	5 floated, 1 sank	Eggs, five in fair condition only, not fresh as represented to be, sale was illegal.
8329	6 floated	Eggs in fair condition only, not fresh as represented to be, sale was illegal.

FLOUR.

Flour is the fine, clean, sound product made by bolting wheat meal and contains not more than 13.5 per cent of moisture, not less than 1.25 per cent of nitrogen, not more than 1 per cent of ash, and not more than 0.50 per cent of fiber.

Flour is the most extensively used food product in this country, and bread made from pure wheat flour is far more nutritious and more nearly a perfect food than is generally supposed by most persons.

Very little adulteration is found in flour, except the bleaching of it by the use of nitrogen peroxide, a poisonous gas. A food product is adulterated: If it be mixed, colored, bleached, powdered, coated or stained in a manner whereby damage or inferiority is concealed, or if it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health.

Investigations have shown that in the bleaching of flour by the Alsop process both classes of adulteration exist. The bleaching agent, nitrogen peroxide, is a poisonous substance and is left in the flour after the bleaching is completed. By bleaching, low grade flours are made to appear like high grade products, the appearance of them being improved without improving their quality. The Alsop Process Company, which owns the patent right for the bleaching process, has made the greatest effort possible to prevent food officials from enforcing the law against the bleaching of flour. They have employed, at tremendous cost, the very best scientific and legal talent that is to be had in this country, but the officials have so far won in every case tried, the most important of which is the one

RESULTS OF THE EXAM

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7024	Flour, Star	W. A. Watson, Greensboro	W. A. Watson, Greensboro
7025	Flour, Purity	----do	----do
7026	Flour, All Wheat	Hico Milling Co., Burlington, N. C.	H. M. Love & Son, Burlington
7027	Flour, White Lily	Dixie Mills, Burlington, N. C.	----do
7028	Flour, Hico	Hico Milling Co., Burlington, N.C.	----do
7029	Flour, Morning Star	Holt-Granite Flouring Mills, Haw River, N. C.	----do
7030	Flour, White Lily	Harmon & de Rundeau, Crimora, Va.	M. V. Lawrence, Durham
7031	Flour, Daisy	Berryville Milling Co., Berryville, Va.	----do
7032	Flour, Perfection	Williams Bros. Co., Kent, Ohio	----do
7033	Flour, Snow Bird	Statesville Flour Mills, Statesville, N. C.	----do

known as the Kansas City case. It was hard fought by both sides and consumed more than five weeks. The court found:

1. Flour bleached by the Alsop process contains added poisonous and deleterious ingredients, which render the flour injurious to health.

2. Flour bleached by the Alsop process contains a substance known as nitrites, which reduces, lowers and injuriously affects the quality and strength of the flour.

3. Flour bleached by the Alsop process is mixed, colored and stained in a manner whereby damage or inferiority is concealed.

4. For these reasons flour bleached by the Alsop process is adulterated within the meaning of the Food Law, and that the character of the adulteration is such that no statement upon the package or label will bring bleached flour within the law.

Practically the above decision has been reached by several courts both State and Federal, and it is not likely that these decisions will be reversed by the higher courts. However, when they are confirmed by the higher courts, officials will then feel absolutely sure of their position, and violations will be more vigorously prosecuted.

Six hundred and thirty-one samples of flour have been examined 46 of which were for experimental purposes and not for added adulteration; but of the 556 examined for adulteration 29 were found to have been bleached and therefore adulterated. However, most of the 29 samples were very lightly bleached and only 3 or 4 were heavily bleached. When the flour was heavily bleached the sale of it as human food was prevented.

INATION OF FLOUR.

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions.
7024	Wheat product	0.80	Nitrogen peroxide	Flour, bleached: sale illegal.
7025	do	None found	None found	Flour.
7026	do	do	do	do.
7027	do	do	do	do.
7028	do	do	do	do.
7029	do	do	do	do.
7030	do	do	do	do.
7031	do	do	do	do
7032	do	do	do	do.
7033	do	do	do	do

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7034	Flour, Primrose	Berryville Milling Co., Berryville, Va.	M. V. Lawrence, Durham
7035	Flour, Golden Fleece	Tennessee Mill Co., Estill Springs, Tenn.	Carpenter Bros., Durham
7036	Flour, Banner	Carrolina Roller Mill Co., Durham, N. C.	do
7037	Flour, Acme	Crimora Mills, Crimora, Va.	do
7038	Flour, White Lily	Beverly Roller Mills, Broad Run, Va.	F. M. Carlton, Durham
7039	Flour, Sweet Belle	A. E. Sides, Mount Airy, N. C.	A. E. Sides, Mount Airy
7040	Flour, Jersey Cream	B. Beasley, Mount Airy, N. C.	B. Beasley, Mount Airy
7041	Flour, Gold Standard	Pearl Roller Mills, Randleman, N.C.	G. C. Lovill & Co., Mount Airy
7042	Flour, Nellie King	Tennessee Mill Co., Estill Springs, Tenn	do
7043	Flour, Driven Snow	do	do
7044	Flour, Honest	J. I Triplett, Woodstock, Va.	W. B. Haymore, Mount Airy
7045	Flour, Champion	do	do
7046	Flour, Cyclone	Statesville Flour Mills, Statesville, N. C.	The West-Hill Co., Mount Airy
7047	Flour, Daniel Boone	North Wilkesboro Roller Mills, N. Wilkesboro, N. C.	North Wilkesboro Roller Mills, N. Wilkesboro.
7048	Flour, Yadkin Ripple	do	do
7049	Flour, White Rose	Elkin Roller Mills, Elkin, N. C.	S. W. Cockeham & Son, Elkin
7050	Flour, St. Elmo	Mountain City Roller M . Chattanooga, Tenn.	C. C. Gentry & Co., Elkin
7051	Flour, Favorite	Dan Valley Mills, Danville, Va.	do
7052	Flour, Stove Buster	Horne-Johnstone Co., Mocksville, N. C.	Horne-Johnstone Co., Mocksville
7053	Flour, Ice Cream	do	do
7054	Flour, Champion	J. I. Triplett, Woodstock, Va.	J. P. Phifer, Statesville
7055	Flour, Superlative Patent	The Dunlop Mills, Richmond, Va.	do
7056	Flour, White Lily	Statesville Flour Mill Co., Statesville, N. C.	do
7057	Flour, Obelisk	Ballard & Ballard, Louisville, Ky.	J. B. Gill, Statesville
7058	Flour, Dan Valley	Dan Valley Mills. Danville, Va.	do
7059	Flour, Jasco	J. Allen Smith & Co., Knoxville, Tenn.	Carolina Flour and Feed Co., Statesville.
7060	Flour, White Cream	do	do
7061	Flour, Pride of Alexander	Taylorsville Milling Co., Taylorsville, N. C.	Taylorsville Milling Co., Taylorsville.
7062	Flour, Clover Leaf	J. Allen Smith Co., Knoxville, Tenn.	Star Canning Co., Taylorsville
7063	Flour, Violet	Statesville Flour Mill Co., Statesville, N. C.	do
7064	Flour, Majestic	Knoxville City Mills, Knoxville, Tenn.	A. H. Matterson, Taylorsville
7065	Flour, Snow	J. Allen Smith & Co., Knoxville, Tenn.	Bee Hive Store, Taylorsville
7066	Flour, Roller King	do	do
7067	Flour, Forest King	The Dunlop Mills, Richmond, Va.	Piedmont Grain and Provision Co., Hickory, N. C.
7068	Flour, Our Plant	Ballard Mills, Lousiville, Ky.	Burns & Martin, Hickory
7069	Flour, Safety	do	do
7070	Flour, Phœnix	E. G. Peeler, Hickory, N. C.	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants	Remarks and Conclusions
7034	Wheat product	None found	None found.	Flour.
7035	do	do	do	do.
7036	do	do	do	do.
7037	do	do	do	do.
7038	do	do	do	do.
7039	do	do	do	do.
7040	do	do	do	do.
7041	do	do	do	do.
7042	do	do	do	do.
7043	do	do	do	do.
7044	do	do	do	do.
7045	do	do	do	do.
7046	do	do	do	do.
7047	do	do	do	do.
7048	do	do	do	do.
7049	do	do	do	do.
7050	do	do	do	do.
7051	do	do	do	do.
7052	do	do	do	do.
7053	do	do	do	do.
7054	do	do	do	do.
7055	do	do	do	do.
7056	do	do	do	do.
7057	do	do	do	do.
7058	do	do	do	do.
7059	do	do	do	do.
7060	do	do	do	do.
7061	do	do	do	do.
7062	do	do	do	do.
7063	do	do	do	do.
7064	do	do	do	do.
7065	do	do	do	do.
7066	do	do	do	do.
7067	do	do	do	do.
7068	do	do	do	do.
7069	do	do	do	do.
7070	do	do	do	do.

RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7071	Flour, Mayflower	T. J. Lutz & Son, Lenoir, N. C.	H. T. Newland, Lenoir
7072	Flour, Snow Flake	Home Milling Co., Lenoir, N. C.	do
7073	Flour, Pond Lily	Conover Roller Mills, Conover, N. C.	Conover Roller Mills, Conover
7074	Flour, Rose Bud	do	do
7075	Flour, Eagle	do	do
7076	Flour, Lucky Star	Kester's New Process Co., Winston, N. C.	Farmers Trade House Co., Winston.
7077	Flour, Pride of Lilas	P. E. Burke, R. F. D. 1, Winston-Salem, N. C.	R. A. Moore, Winston-Salem
7078	Flour, Baker's Pr de	Arcadia Mills Co., Enterprise, N. C.	J. J. Adams, Winston
7079	Flour, Electric Light	L. H. Sides & Son, R. F. D. 1, Winston, N. C.	Farmers Stock Co., Winston
7080	Flour, Roller King	Asheville Milling Co., Asheville, N. C.	S. A. Ingle, Asheville
7081	Flour, Tube Rose	Acme Milling Co., Talbot, Tenn.	do
7082	Flour, New Found	Leicester Roller Mills, Leicester, N. C.	do
7083	Flour, Biltmore	Asheville Milling Co., Asheville, N. C.	do
7084	Flour, Climax	do	do
7085	Flour, Best XXXX	Pillsbury, Minneapolis, Minn.	Asheville Grocery Co., Asheville
7086	Flour, Wheat and Rye	North Star Feed and Cereal Co., Minneapolis, Minn.	do
7087	Flour, Pillsbury's Best	Pillsbury, Minneapolis, Minn.	C. Sawyer, Asheville
7088	Flour, Dinner Party	Manufactured for C. Sawyer, Asheville, N. C.	do
7089	Flour, Purina Whole Wheat	Purina Mills, St. Louis, Mo.	Smathers & Young, Asheville
7090	Flour, Heekers	Hecker-Jones-Jewel Milling Co., New York.	do
7091	Flour, Purity	Princeton Milling Co., Princeton, Md.	do
7092	Flour, Queen of the Pantry	Wagner-Gates Milling Co., Indianapolis Ind.	do
7093	Flour, Gold Coin	Eagle Roller Mill Co., New Ulm, Minn.	Stradley & Luther, Asheville
7094	Flour, Ben Hur	Hennepin Mill Co., Louisville, Ky.	John E. Fain, Murphy
7095	Flour, Driven Snow	Tennessee Mill Co., Estill Springs, Tenn.	do
7096	Flour, Gilt Edge	The Morristown Mills, Morristown, Tenn.	R. H. Hyatt & Co., Murphy
7097	Flour, Elberton	J. M. Veach & Co., Adairsville, Ga.	Owenby-Woffard Co., Murphy
7098	Flour, Gold Medal	Washburn-Crosby Milling Co., Minneapolis, Minn.	Haywood Grocery Co., Waynesville.
7099	Flour, Royal Family	Kentucky Milling Co., Covington, Ky.	do
7100	Flour, White Lily	Waynesville Milling Co., Waynesville, N. C.	J. C. Bennett Co., Waynesville
7101	Flour, Obelisk	Ballard & Ballard, Louisville, Ky.	J. D. Boone, Waynesville
7102	Flour, Gold Medal	Mountain City Mills, Chattanooga, Tenn.	Clyde H. Ray, Waynesville
7103	Flour, Harvest Queen	Pigeon Valley Mills, Canton, N. C.	Lee & Mock, Waynesville
7104	Flour, Roller King	J. Allen Smith & Co., Knoxville, Tenn.	do
7105	Flour, Superlative	The Dunlop Mills, Richmond, Va.	Blackwell & Bushnell Co., Waynesville.
7106	Flour, Silver Spray	Newport Mill Co., Newport, Tenn.	Jeffress & Co., Canton
7107	Flour, Cotton Bloom	do	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
7071	Wheat product	None found	None found	Flour.
7072	do	do	do	do
7073	do	do	do	do
7074	do	do	do	do
7075	do	do	do	do
7076	do	do	do	do
7077	do	do	do	do
7078	do	do	do	do
7079	do	do	do	do
7080	do	do	do	do
7081	do	do	do	do
7082	do	do	do	do
7083	do	do	do	do
7084	do	do	do	do
7085	do	do	do	do
7086	do	do	do	do
7087	do	do	do	do
7088	do	do	do	do
7089	do	do	do	do
7090	do	do	do	do
7091	do	do	do	do
7092	do	do	do	do
7093	do	do	do	do
7094	do	do	do	do
7095	do	do	do	do
7096	do	do	do	do
7097	do	1.00	Nitrogen peroxide	Flour, bleached; sale illegal.
7098	Wheat product	None found	None found	Flour.
7099	do	do	do	do
7100	do	do	do	do
7101	do	do	do	do
7102	do	do	do	do
7103	do	do	do	do
7104	do	do	do	do
7105	do	do	do	do
7106	do	do	do	do
7107	do	do	do	do

RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7108	Flour, French Broad	Marshall Mill Co., Marshall, N.C.	Jeffress & Co., Canton
7109	Flour, City Trade	----do	----do
7111	Flour, Baker's Straight	Salisbury Milling Co., Salisbury, N. C.	Overman & Co., Salisbury
7110	Flour, Purity	----do	----do
7112	Flour, Grimes	Grimes Milling Co., Salisbury, N. C.	H. Z. White, Salisbury
7113	Flour, Silver Cloud	----do	----do
7219	Flour, White Frost	High Point Milling Co., High Point, N. C.	V. W. Idol & Co., High Point
7220	Flour	----do	----do
7221	Flour, Our Best	Grimes Bros., Lexington, N. C.	P. H. Johnson, High Point
7222	Flour, Pride of Reidsville	J. H. Walker & Co., Reidsville, N. C.	Hutcheson Bros., Reidsville
7223	Flour, Farmer's Choice	----do	----do
7224	Flour, Golden Rod	Aikin-Erskine Mill Co., Evansville, Ind.	Cromess Bros., Winston-Salem
7225	Flour, Our Best	M. E. Bishop, Thomasville, N. C.	Norman Bagby Co., Winston-Salem.
7226	Flour, Golden Grain	Forsyth Roller Mills, Winston-Salem, N. C.	----do
7227	Flour	Stedman & Shore, Shore, N. C.	Stedman & Shore, Shore
7229	Flour, Pride of Yadkin	Holton & Dunnagan, Yadkinville, N. C.	Shore & Douthat, Yadkinville
7231	Flour, S. T. H.	S. T. Hinshaw, Yadkinville, N.C.	S. T. Hinshaw, Yadkinville
7232	Flour, Ladies' Choice	Isaac Shore, Yadkinville, N. C.	Isaac Shore, Yadkinville
7233	Flour, Snow Drift	Waynesboro Milling Co., Waynesboro, Va.	Elmore & Maxwell, Greensboro
7234	Flour	----do	----do
7235	Flour, Stock's Best Patent	F. W. Stock, Hillsdale, Mich.	Best & Thompson, Goldsboro
7236	Flour, Value Received	Peerless Mills, Kent, Ohio	L. M. Michaux, Goldsboro
7237	Flour, Perfection	----do	----do
7238	Flour, Quail	Standard Cereal Co., Chillicothe, Ohio.	Baker-Bizzell Co., Goldsboro
7239	Flour, Cream of Wheat	Mutual Milling and Supply Co., Harrisonburg, Va.	Pittman-Best Co., Goldsboro
7240	Flour, Ann Arbor	Michigan Milling Co., Ann Arbor, Mich.	Sumrell & McCoy, Kinston
7241	Flour	Amendt Milling Co., Monroe, Mich	----do
7242	Flour, White Moss Rose	Thoman Milling Co., Lansing, Mich.	Cobb & Johnson, Kinston
7243	Flour, Columbia	Acme-Evans Co., Indianapolis, Ind.	New Bern Fruit Co., New Bern
7245	----do	Geo. T. Evans & Son, Indianapolis, Ind.	----do
7246	Flour, E. Z. Bake	----do	----do
7247	Flour, Nonpareil	F. W. Stock, Hillsdale, Mich.	C. S. Hollister, New Bern
7248	Flour, Stock's Best	----do	----do
7249	Flour, Ideal	Detroit Milling Co., Detroit, Mich.	J. E. Ramsey, Beaufort
7250	Flour, Stock's Best	F. W. Stock, Hillsdale. Mich.	Beaufort Grocery Co., Beaufort
7251	Flour, Blue Ribbon	A. H. Randall Mill Co., Tekonsha, Mich.	----do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants	Remarks and Conclusions.
7108	Wheat product	None found	None found	Flour.
7109	do	do	do	do.
7111	do	do	do	do.
7110	do	do	do	do.
7112	do	do	do	do.
7113	do	do	do	do.
7219	do	do	do	do.
7220	do	0.22	Nitrite nitrogen	Flour, slightly bleached
7221	do	None found	None found	Flour.
7222	do	do	do	do.
7223	do	do	do	do.
7224	do	do	do	do.
7225	do	do	do	do.
7226	do	do	do	do.
7227	do	do	do	do.
7229	do	do	do	do.
7231	do	do	do	do.
7232	do	do	do	do.
7233	do	do	do	do
7234	do	do	do	do.
7235	do	do	do	do.
7236	do	do	do	do.
7237	do	do	do	do.
7238	do	1.32	Nitrite nitrogen	Flour, heavily bleached sale illegal.
7239	do	None found	None found	Flour.
7240	do	do	do	do.
7241	do	do	do	do.
7242	do	do	do	do.
7243	do	do	do	do.
7245	do	do	do	do.
7246	do	do	do	do.
7247	do	do	do	do.
7248	do	do	do	do.
7249	do	do	do	do.
7250	do	do	do	do.
7251	do	do	do	do.

RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7252	Flour, Tidal Wave	Michigan Milling Co., Ann Arbor, Mich.	F. E. Hashagen, Wilmington
7253	Flour, Queen	David Stotts, Detroit, Mich.	The Worth Co., Wilmington
7254	Flour, Fancy	do	do
7255	Flour, Maple Leaf	Buena Vista Mills, Buena Vista, Va.	H. D. Baldwin, Rockingham
7256	Flour, Matchless	Virginia Roller Mills, Winchester, Va.	do
7257	Flour, City Belle	Harrisonburg Milling Co., Harrisonburg, Va.	do
7258	Flour, Porcelain	Andrew Bowling, Staunton, Va.	do
2759	Flour, White Rose	Statesville Flour Mill Co., Statesville, N. C.	A. W. Porter Co., Rockingham
7260	Flour, Kline Bros. Best	Benevola Roller Mills, Benevola, Md.	Crow Bros., Monroe
7262	Flour, Temple Garden	Portland Milling Co., Portland, Mich.	A. F. Messick Gro. Co., Charlotte.
7263	Flour, White Frost	Voight Milling Co., Grand Rapids, Mich.	Adams Grain and Provision Co., Charlotte.
7264	Flour, Ann Arbor	Michigan Milling Co., Ann Arbor,	Cochran & McLaughlin, Charlotte.
7265	Flour, Bowden's Best	The R. H. Brown Co., Linville, Va.	do
7266	Flour, Melrose	White Star Mills, Staunton, Va.	W. F. Redman, Charlotte
7267	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	Chambers & Moody, Charlotte
7268	Flour, Royal	Dunlap Mills, Clarksville, Tenn.	J. F. Johnson & Co., Gastonia
7269	Flour, Golden Grain	Argo Mills, Ann Arbor, Mich.	F. D. Barkley, Gastonia
7270	Flour, Snow Flake	Broadway Milling Co., Broadway, Va.	Major Hopper, Shelby
7271	Flour, Cream Loaf	do	do
7273	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	W. B. Palmer & Son, Shelby
7274	Flour, Patapsco	C. A. Gambrill Mfg. Co., Baltimore, Md.	do
7275	Flour, Copyright	Blish Milling Co., Seymour, Ind.	W. J. Arey, Shelby
7276	Flour, Beauty	do	do
7278	Flour, Welfrey's Roller King	Front Royal Milling Co., Front Royal, Va.	do
7279	Flour, Monitor	Statesville Flour Mill Co., Statesville, N. C.	Gaston & Tate, Marion
7280	Flour, Catawba Valley	Brown Bros., Marion, N. C.	A. Blanton Grocery Co., Marion
7282	Flour, Lone Star	Piedmont Mills, Lynchburg, Va.	Overman & Co., Salisbury
7283	Flour, Southern Belle	Concord Milling Co., Concord, N. C.	H. M. Blackwelder, Concord
7284	Flour, Old Sleepy Eye Cream	Sleepy Eye Milling Co., Sleepy Eye, Minn.	Peeler Grain and Prov. Co., Salisbury.
7285	Flour, Lily White	Dunlop Mills, Richmond, Va.	do
7288	Flour, Pride of Reidsville	J. H. Walker & Co., Reidsville,	G. C. Welch, Mount Airy
7289	Flour, Purity	Forsyth Roller Mills, Winston-Salem, N. C.	Farmers Stock Co., Winston-Salem.
7290	Flour, Sanford's Best	Northwestern Mill and Elevator Co., Toledo, Ohio.	Sanford Grocery Co., Sanford
7291	Flour, Gold Leaf	Piedmont Mills, Inc., Lynchburg, Va.	do
7292	Flour, Silver Star	Julian Milling Co., Julian, N. C.	W. T. Buchanan, Sanford
7293	Flour, Pride of Randolph	Ashboro Roller Mills, Ashboro, N. C.	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
7252	Wheat product	None found	None found	Flour.
7253	do	do	do	do.
7254	do	do	do	do.
7255	do	do	do	do.
7256	do	do	do	do.
7257	do	do	do	do.
7258	do	do	do	do.
7259	do	do	do	do.
7260	do	do	do	do.
7262	do	do	do	do.
7263	do	do	do	do.
7264	do	do	do	do.
7265	do	do	do	do.
7266	do	do	do	do.
7267	do	do	do	do.
7268	do	do	do	do.
7269	do	do	do	do.
7270	do	do	do	do.
7271	do	do	do	do.
7273	do	do	do	do.
7274	do	do	do	do.
7275	do	do	do	do.
7276	do	Trace	Trace	do.
7278	do	None found	None found	do.
7279	do	do	do	do.
7280	do	do	do	do.
7282	do	do	do	do.
7283	do	do	do	do.
7284	do	do	do	do.
7285	do	do	do	do.
7288	do	Trace	Trace	do.
7289	do	do	do	do.
7290	do	do	do	do.
7291	do	None found	None found	do.
7292	do	do	do	do.
7293	do	do	do	do

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7294	Flour, Gold Leaf	Piedmont Mills, Inc., Lynchburg, Va.	J. T. Ginn, Goldsboro
7295	Flour, Waseo	Lyon & Greenleaf, Waseon, Ohio	----do
7296	Flour, Adena		C. D. Taylor, Goldsboro
7297	Flour, Cream Loaf	Broadway Milling Co., Broadway, Va.	----do
7299	Flour, Lotus	Amendt Mill Co., Monroe, Mich.	Hales & Edwards, Rocky Mount
7300	Flour, A No. 1	Isaac Harter Milling Co., Toledo, Ohio.	----do
7302	Flour, White Swan	Peninsular Milling Co., Flint, Mich.	Matthews-Weeks & Co., Rocky Mount.
7303	Flour, Seal of Ohio	The Gwinn Milling Co., Columbus, Ohio.	----do
7317	Flour, Valley Cream	A. J. Butte Milling Co., Canton, Mo.	F. C. Allen & Son, Wadesboro
7318	Flour, White Swan	----do	----do
7319	Flour, Satisfaction	E. F. Spears & Son, Paris, Ky.	Parsons & Hardison, Wadesboro
7320	Flour, Fancy Patent	Ohio-Indiana Milling Co., Cincinnati, Ohio.	H. W. Little, Wadesboro
7321	Flour, Royal Crown	Mountain City Mills, Frederick, Md.	Adams Grain and Provision Co., Charlotte.
7322	Flour, Marvel	Listman Mill Co., LaCrosse, Wis.	----do
7323	Flour, Imperial	Jefferson Milling Co., Charlestown, W. Va.	----do
7325	Flour, Roller Champion	Valley City Milling Co., Grand Rapids, Mich.	----do
7326	Flour, Cream of Wheat	J. Hale & Sons, Lyons, Mich.	----do
7327	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	Chas. Moody Co., Charlotte
7328	Flour, Best	J. D. Greyhill & Sons, Belleville, Pa.	Johnson & Bros., Charlotte
7329	Flour, Our Standard	Loudoun Valley Milling Co., Purcellville, Va.	Chas. Moody Co., Charlotte
7330	Flour, Dainty	Valier & Spies Milling Co., Marine, Ill.	J. W. Carter, Maxton
7331	Flour, White Moss Rose	Thoman Roller Mills, Lansing, Mich.	----do
7335	Flour, Peoples Patent		Hines & Spicer, Goldsboro*
7336	Flour, Standard Patent		----do
7337	Flour, Uncle Sam		----do
7338	Flour, Upper Crust		----do
7339	Flour, Cream Loaf		----do
7359	Flour, Golden Grain	Concord Milling Co., Concord, N. C.	Carpenter Bros., Kings Mountain.
7360	Flour, Red Star	----do	----do
7361	Flour, Calla Lily	Newport Mill Co., Newport, Tenn.	J. D. Boyd, Hendersonville
7362	Flour, Pure Gold	Louisville Milling Co., Louisville, Ky.	England's Store, Brevard
7363	Flour, Superlative	Washburn-Crosby Co., Louisville, Ky.	----do
7365	Flour, Gold Coin	Eagle Roller Mills, New Ulm, Minn.	Baird Bros., Asheville
7375	Flour, Mount Vernon	North-Western Elevator and Mill Co., Mt. Vernon, Ohio.	J. B. Morton, Morehead City
7376	Flour, Big Four	Cairo Milling Co., Cairo, Ill.	----do
7380	Flour, Pr de of Colorado	E. H. Weckbaugh, Denver, Colo.	Hall & Pearsall, Wilmington

*Sent to the Department for analysis.

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions.
7294	Wheat product	None found	None found	Flour.
7295	do	do	do	do.
7296	do	do	do	do.
7297	do	do	do	do.
7299	do	do	do	do.
7300	do	do	do	do.
7302	do	do	do	do.
7303	do	do	do	do.
7317	do	do	do	do.
7318	do	do	do	do.
7319	do	do	do	do.
7320	do	do	do	do.
7321	do	do	do	do.
7322	do	do	do	do.
7323	do	do	do	do.
7325	do	do	do	do.
7326	do	do	do	do.
7327	do	do	do	do.
7328	do	do	do	do.
7329	do	do	do	do.
7330	do	do	do	do.
7331	do	Trace	Trace	do.
7335	do	None found	None found	do.
7336	do	do	do	do.
7337	do	do	do	do.
7338	do	do	do	do.
7339	do	do	do	do.
7359	do	do	do	do.
7360	do	do	do	do.
7361	do	do	do	do.
7362	do	Trace	Trace	do.
7363	do	None found	None found	do.
7365	do	do	do	do.
7375	do	do	do	do.
7376	do	do	do	do.
7380	do	Trace	Trace	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7794	Flour, William Tell	Ansted-Burk Co., Springfield, O.	Davidson & Wolf, Charlotte
7845	Flour, Dewey's Best	The Dewey Bros. Co., Blanchester, Ohio.	Bizzell & Ormond, Goldsboro
7944	Flour, Sea Foam	F. Thoman Milling Co., Lansing, Mich.	E. R. Mixon & Co., Washington
7823	Flour, William Tell	Ansted-Burk Co., Springfield, O.	O. M. Boyd & Co., Gastonia
7854	Flour, Dewey's Best	The Dewey Bros. Co., Trebeins, Ohio.	M. J Best & Sons, Goldsboro
8153	Flour, Bob White	Ansted-Burk Co., Springfield, O.	Norman-Moir-Dalton Co., Winston-Salem.
7917	Flour, Blue Ribbon	Richards-Evans Co., Cortland, O.	P. L. Woodard & Co., Wilson
8129	Flour, Nellie King	Tennessee Mill Co., Estill Springs, Tenn.	J. F. Johnson Co., Gastonia
8130	Flour, Melrose	White Star Mills, Staunton, Va.	J. F. Jamison, Charlotte
8131	Flour, Snow King	The Page Milling Co., Luray, Va.	---do---
8132	Flour, Diamond	Louden Valley Mills, Purcellsville, Va.	---do---
8133	Flour, Acme	Alex Parks, Martinsburg, W. Va.	---do---
8134	Flour, Luxury	High Point Milling Co., High Point N. C.	Davis & Byerly, Charlotte
8135	Flour, Lake	Lake View Milling Co., Chambersburg, Pa.	---do---
8136	Flour, Best	A. L. Mengies & Bro., Mengies Mills, Pa.	---do---
7933	Flour, Blue Ribbon	A. H Randall Mill Co., Tekonsha, Mich.	Greenville Wholesale Co., Greenville.
7934	Flour, Obelisk	Ballard & Ballard, Louisville, Ky.	S. M. Schultz, Greenville
7935	Flour, Dunlop Patent	Dunlop Mills, Richmond, Va.	---do---
7936	Flour, Henry Clay	Lexington Roller Mills, Lexington, Ky.	---do---
7937	Flour, Carolina	C. Syer & Co., Norfolk, Va.	Hooker & Anthony, Greenville
7938	Flour, Dunlop Superlative	Dunlop Roller Mills, Richmond, Va.	Jno. Williams, Bakery, Greenville.
7939	Flour, Staten Island	Hecker-Jones-Jewell Co., New York, N. Y.	---do---
7940	Flour, Stock's Patent	F. W. Stock, Hillsdale, Mich.	E. Peterson Grocery Co., Washington.
7941	Flour, Royal	Voight Milling Co., Grand Rapids, Mich.	---do---
7942	Flour, Garland	Garland Milling Co., Greensburg, Ind.	E. R. Mixon & Co., Washington
7943	Flour, E. Z. Bake	Acme-Evans Co., Indianapolis, Ind.	---do---
7946	Flour, Pinnacle	Garland Milling Co., Greensburg, Ind.	F. G. Paul & Bro., Washington.
7947	Flour, Cutter's Best	National Milling Co., Toledo, O.	H. H. Satterthwaite, Washington
7948	Flour, Town Talk	Lawrenceburg Roller Mill Co., Lawrenceburg, Ind.	Jos. F. Tayloe, Washington
7949	---do---	---do---	---do---
7951	Flour, Cutter's Best	National Milling Co., Toledo, O.	Pamlico Grocery Co., Washington.
7952	Flour, Waseo	Lyon & Greenleaf, Waseon, Ohio	
7953	Flour, Pond Lily	Garland Milling Co., Greensburg, Ind.	Union Grocery Co., Washington
7954	Flour, 20th Century	---do---	---do---
7771	Flour, Golden Grain	Concord Milling Co., Concord, N. C.	H. M. Blackwelder, Concord
7772	Flour, Golden Crown	Mountain City Mills, Frederick, Md.	G. W. Patterson, Concord
7773	Flour, Forest King	The Dunlop Mills, Richmond, Va.	---do---

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
7794	Wheat product	0.30	Nitrite nitrogen	Flour, bleached slightly
7845	do	0.30	do	do.
7944	do	0.76	do	Flour, bleached; sale illegal
7823	do	0.24	do	Flour, bleached slightly.
7854	do	0.48	do	Flour, bleached; sale illegal
8153	do	2.00	do	Flour, bleached; sale prohibited.
7917	do	0.20	do	Flour, bleached slightly
8129	do	None found	None found	Flour.
8130	do	do	do	do.
8131	do	do	do	do.
8132	do	do	do	do
8133	do	do	do	do.
8134	do	do	do	do
8135	do	do	do	do
8136	do	do	do	do.
7933	do	do	do	do.
7934	do	do	do	do.
7935	do	do	do	do.
7936	do	do	do	do.
7937	do	do	do	do.
7938	do	do	do	do.
7939	do	do	do	do.
7940	do	do	do	do.
7941	do	do	do	do.
7942	do	do	do	do.
7943	do	do	do	do.
7946	do	do	do	do.
7947	do	do	do	do.
7948	do	do	do	do.
7949	do	do	do	do.
7951	do	do	do	do.
7952	do	do	do	do.
7953	do	do	do	do.
7954	do	do	do	do.
7771	do	do	do	do.
7772	do	do	do	do.
7773	do	do	do	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7776	Flour, Don Q	Larabee Flour Mill Co., Hutchinson, Kans.	Cline & Moore, Concord
7777	Flour, Empress	do	do
7778	Flour, Melrose	White Star Mills, Staunton, Va.	do
7779	Flour, Cutter's Best	National Milling Co., Toledo, O.	Irwin-Graham Co., Charlotte
7780	Flour, Daniel Webster	Eagle Roller Mill Co., New Ulm, Minn.	do
7781	Flour, Gold Coin	do	do
7782	Flour, Royal	The Dunlap Milling Co., Clarksville, Tenn.	do
7783	Flour, Jay Bird	C. N. Whiting, Shepherdstown, W. Va.	do
7784	Flour, Evidence	J. Allen Smith Co., Knoxville, Tenn.	do
7785	Flour, Ann Arbor	Michigan Milling Co., Ann Arbor, Mich.	Cochran & McLaughlin, Charlotte.
7786	Flour, Half Patent	Ohio-Indiana Milling Co., Cincinnati, Ohio.	do
7787	Flour, Snow Flake	E. A. Faust & Co., Chambersburg, Pa.	do
7788	Flour, Success	Michigan Milling Co., Ann Arbor, Mich.	do
7789	Flour, B. B. Best	The R. H. Brown Co., Linville Depot, Va.	do
7790	Flour Blue Ridge	Blue Ridge Milling Co., Grottoes, Va.	do
7791	Flour, Snow King	The Page Milling Co., Luray, Va.	do
7792	Flour, "Ohio"	L. A. & W. L. O'Roarey, Covington, Ohio.	Davidson & Wolf, Charlotte
7793	Flour, Gish's Best	H. L. Gish, Mercersburg, Pa.	do
7795	Flour, The Chief	Alex. Parks, Martinsburg, W. Va.	do
7796	Flour, Melrose	White Star Mills, Staunton, Va.	do
7798	Flour, Magnolia	D. A. Slickell & Son, Hagerstown, Md.	Chas. P. Moody, Co. Charlotte.
7799	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	do
7800	Flour, Delicious Diet	H. M. Kauffman, Luray, Va.	Adams Grain and Provision Co., Charlotte.
7801	Flour, Meadow Brook	Roberts-Roop & Co., Westminster, Md.	do
7802	Flour, Perfection	Williams Bros. Co., Kent, Ohio	do
7803	Flour, Allender's Best	J. H. Allender, Roller, Md.	do
7804	Flour, Golden Crown	Mountain City Mills, Frederick, Md.	do
7805	Flour, White Frost	Voight Milling Co., Grand Rapids, Mich.	do
7806	Flour, Imperial	Jefferson Milling Co., Charlestown, W. Va.	do
7807	Flour, Roller Champion	Valley City Milling Co., Grand Rapids, Mich.	do
7808	Flour, Best Patent	Jno. D. Greyhill & Sons, Belleville, Pa.	W. F. Redmond, Charlotte
7809	Flour, Snow Flake	E. A. Faust & Co., Chambersburg, Pa.	do
7810	Flour, Melrose	White Star Mills, Staunton, Va.	do
7811	Flour, Carnation	Piedmont Mills, Inc., Lynchburg, Va.	The Brinkman Co., Charlotte
7812	Flour, White Satin	Mountain City Mill Co., Chattanooga, Tenn.	do
7813	Flour, Superlative Diamond.	Piedmont Mills, Lynchburg, Va.	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrogen Per Kilo of Flour—Milligrams.	Adulterants	Remarks and Conclusions
7776	Wheat product	None found	None found	Flour
7777	do	do	do	do.
7778	do	do	do	do.
7779	do	do	do	do
7780	do	do	do	do
7781	do	do	do	do
7782	do	do	do	do
7783	do	do	do	do
7784	do	do	do	do
7785	do	do	do	do
7786	do	do	do	do
7787	do	do	do	do.
7788	do	do	do	do.
7789	do	do	do	do.
7790	do	do	do	do
7791	do	do	do	do
7792	do	do	do	do
7793	do	do	do	do
7795	do	do	do	do.
7796	do	do	do	do.
7798	do	do	do	do.
7799	do	do	do	do.
7800	do	do	do	do.
7801	do	do	do	do.
7802	do	do	do	do
7803	do	do	do	do.
7804	do	do	do	do.
7805	do	do	do	do.
7806	do	do	do	do.
7807	do	do	do	do.
7808	do	do	do	do.
7809	do	do	do	do.
7810	do	do	do	do.
7811	do	do	do	do.
7812	do	do	do	do.
7813	do	do	do	do.

RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler	Retail Dealer or Party Who Sent Sample for Analysis.
7814	Flour, Purity	Lexington Mill and Elevator Co., Lexington, Neb.	Johnson Bros., Charlotte
7816	Flour, German Mill	Larabee's Mill, Hutchinson, Kan.	F. D. Barkley & Co., Gastonia
7817	Flour, Golden Crown	Mountain City Mills, Frederick, Md.	do
7819	Flour, Eldean	The Allen-Wheeler Co., Troy, O.	do
7820	Flour, Peerless	do	do
7821	Flour, Lily White	Warner Moore & Co., Richmond, Va.	do
7822	Flour, Kismet	Noblesville Milling Co., Noblesville, Ohio.	O. M. Boyd & Co., Gastonia
7824	Flour, Town Talk	Lawrence Roller Mill Co., Lawrenceburg, Ind.	J. F. Johnson, Gastonia
7825	Flour, Royal	The Dunlop Milling Co., Clarksville, Tenn.	do
7826	Flour, Obelisk	Ballard & Ballard, Louisville, Ky.	do
7827	Flour, Climax	Carrolina Roller Mill Co., Durham, N. C.	do
7828	Flour, Mountain Gem	McAllister & Bell, Covington, Va.	W. R. Dorsett & Co., Raleigh
7829	Flour, Guiding Star	Rockland Milling Co., Weyers Cave, Va.	W. B. Mann & Co., Raleigh
7830	Flour, Acme	Strasburg Steam Flour Mills, Strasburg, Va.	do
7831	Flour, Patapsco	C. A. Gambrill Mfg. Co., Richmond, Va.	D. T. Johnson & Co., Raleigh
7833	Flour, Dan Valley	Dan Valley Milling Co., Danville, Va.	DeWar & Wilder, Raleigh
7834	Flour, Monogram	Harrisonburg Milling Co., Harrisonburg, Va.	Peebles Bros., Raleigh
7835	Flour, Calla Lily	Voight Milling Co., Grand Rapids, Mich.	Morris Bros. Co., Raleigh
7836	Flour, Lily of the Valley	Jefferson Milling Co., Charlestown, W. Va.	Poole & Hobby Co., Raleigh
7837	Flour, Evidence	J. Allen Smith Co., Knoxville, Tenn.	do
7838	Flour, Morning Star	Holt-Granite Flour Mills, Haw River, N. C.	
7839	Flour, Dunlop's Superlative.	The Dunlop Mills, Richmond, Va.	Nowel & Richardson, Selma
7840	Flour, Purity	Port Republic Milling Co., Port Republic, Va.	do
7841	Flour, Lotus	Amendt Milling Co., Monroe, Mich.	Selma Supply Co., Selma
7842	Flour, Oak Ridge	Dan Valley Mills, Danville, Va.	Farmers Mercantile Co., Selma
7843	Flour, Dan Valley	do	do
8010	Flour, White Rock	Piedmont Mills, Lynchburg, Va.	The Atkinson Co., Elkin
8011	Flour, Piedmont	do	do
8012	Flour, Ideal	Detroit Milling Co., Detroit, Mich.	do
8013	Flour, Nellie King	Tennessee Mill Co., Estill Springs, Tenn.	Pearson Bros., Wilkesboro
8014	Flour, Pillsbury's Best	Pillsbury Flour Mill Co., Minneapolis, Minn.	F. D. Forester & Co., Wilkesboro
8015	Flour, White Cream	J. Allen Smith, Knoxville, Tenn.	do
8016	Flour, Little Pilgrim	Nashville Roller Mills, Nashville, Tenn.	S. V. Tomlinson, Wilkesboro
8017	Flour	Pillsbury's Mill, Minneapolis, Minn.	do
8018	Flour, Alliance	Wells-Abbott-Newman Co., Schuyler, Neb.	Madison Grocery Co., Madison
8019	Flour	do	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
7814	Wheat product	None found	None found	Flour.
7816	do	do	do	do.
7817	do	do	do	do.
7819	do	do	do	do.
7820	do	do	do	do.
7821	do	do	do	do.
7822	do	do	do	do.
7824	do	do	do	do.
7825	do	do	do	do.
7826	do	do	do	do.
7827	do	do	do	do.
7828	do	do	do	do.
7829	do	do	do	do.
7830	do	do	do	do.
7831	do	do	do	do.
7833	do	do	do	do.
7834	do	do	do	do.
7835	do	do	do	do.
7836	do	do	do	do.
7837	do	do	do	do.
7838	do	do	do	do.
7839	do	do	do	do.
7840	do	do	do	do.
7841	do	do	do	do.
7842	do	do	do	do.
7843	do	do	do	do.
8010	do	do	do	do.
8011	do	do	do	do.
8012	do	do	do	do.
8013	do	do	do	do.
8014	do	do	do	do.
8015	do	do	do	do.
8016	do	do	do	do.
8017	do	do	do	do.
8018	do	do	do	do.
8019	do	do	do	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8020	Flour, Snow Drift	Waynesboro Milling Co., Waynesboro, Va.	Madison Grocery Co., Madison.
8021	Flour, Primrose	Buena Vista Mills, Buena Vista, Va.	do
8022	Flour, Cotton Blossom	do	do
8023	Flour, Maple Leaf	do	do
8025	Flour, Purity	Port Republic Milling Co., Port Republic, Va.	T. D. Meador Grocery Co., Madison.
8026	Flour, Royall	do	do
8027	Flour, Favorite	Lake View Roller Mills, Lynchburg, Va.	The West Hill Co., Mount Airy.
8028	Flour, Piedmont	Piedmont Mills, Lynchburg, Va.	do
8029	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	do
8030	Flour, Snow Flake	Strasburg Steam Flour Mill Co., Strasburg, Va.	Granite Mercantile Co., Mount Airy.
8031	Flour, Climax	do	do
8032	Flour, Gold Coin	Eagle Roller Mills, New Ulm, Minn.	Baird Bros., Asheville
8033	Flour, Copyright	Blish Milling Co., Seymour, Ind.	Asheville Grocery Co., Asheville.
8034	Flour, Golden West	Wells-Abbott-Newman Co., Schuyler, Neb.	do
8035	Flour, Belle of Tennessee	Morristown Mills, Morristown, Tenn.	do
7844	Flour, White Rose	Moses Bros., Lexington, Va.	Burlington Feed Store, Burlington.
7737	Flour, Our Best	M. E. Bishop & Son, Thomasville, N. C.	Peeler Grain and Provision Co., Salisbury.
7738	Flour, Daisy	do	do
7741	Flour, Our Best	Grimes Bros., Lexington, N. C.	W. H. Moffit, Lexington
7742	Flour, Our Patent	Model Mills, Lexington, N. C.	do
7743	Flour, Tar Heel's Delight	Grimes Bros., Lexington, N. C.	do
7744	Flour, Grimes' Best	do	Grimes Bros., Lexington.
7745	Flour	do	do
7746	Flour, White Frost	High Point Milling Co., High Point, N. C.	C. E. Siceloff, High Point
7747	Flour, White Rose	Dixie Milling Co., High Point, N. C.	do
7748	Flour, Luxury	High Point Milling Co., High Point, N. C.	do
7749	Flour, Emerald	Adams Flour Co., Richmond, Va.	Hutcheson Bros., Reidsville
7750	Flour, Farmers Choice	J. H. Walker & Co., Reidsville, N. C.	do
7751	Flour, Pride of Reidsville	do	do
7752	Flour, Lily of the Valley	The Page Milling Co., Luray, Va.	do
7753	Flour, Farmer's Choice	J. H. Walker & Co., Reidsville, N. C.	J. H. Walker & Co., Reidsville.
7754	do	do	do
7755	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	American Commission Co., Greensboro.
7757	Flour, Star	W. A. Watson & Co., Greensboro, N. C.	Patterson Bros., Greensboro
7758	Flour, Morning Star	Holt-Granite Flour Mills, Haw River, N. C.	G. T. McLamb, Greensboro
7759	Flour, Pick of the Harvest	do	do
7741	Flour, Sweet Water Valley	Atlanta Milling Co., Atlanta, Ga.	Collins & Biggers, Monroe

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants	Remarks and Conclusions
8020	Wheat product	None found.	None found	Flour.
8021	do	do	do	do.
8022	do	do	do	do.
8023	do	do	do	do.
8025	do	do	do	do.
8026	do	do	do	do.
8027	do	do	do	do.
8028	do	do	do	do.
8029	do	do	do	do.
8030	do	do	do	do.
8031	do	do	do	do.
8032	do	do	do	do.
8033	do	do	do	do.
8034	do	do	do	do.
8035	do	do	do	do.
7844	do	do	do	do.
7737	do	do	do	do.
7738	do	do	do	do.
7741	do	Trace	Trace	do.
7742	do	None found	None found	do.
7743	do	Trace	Trace	do.
7744	do	do	do	do
7745	do	do	do	do.
7746	do	None found	None found	do.
7747	do	do	do	do.
7748	do	do	do	do.
7749	do	do	do	do.
7750	do	do	do	do.
7751	do	Trace	Trace	do.
7752	do	None found	None found	do.
7753	do	do	do	do.
7754	do	do	do	do.
7755	do	do	do	do.
7757	do	Trace	Trace	do.
7758	do	do	do	do.
7759	do	None found	None found	do.
7711	do	do	do	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7712	Flour, Champion	D. A. Slickell & Son, Hagerstown, Md.	Collins & Biggers, Monroe
7713	Flour, Baker's Choice	Henderson Roller Mills, Monroe, N. C.	----do
7714	Flour, White Rose	The Front Royal Milling Co., Front Royal, Va.	Crow Bros, Monroe
7715	Flour, Fancy Patent	Lexington Mill and Elevator Co., Lexington, Neb.	Johnston Bros., Charlotte
7716	Flour, Kline Bros., Best	Benevola Roller Mills, Benevola, Md	----do
7717	Flour, Porcelain	Andrew Bowling, Staunton, Va.	Irwin-Graham Co., Charlotte
7718	Flour, Jay Bird	C. N. Whiting, Shepherdstown, W. Va	
7719	Flour, Tar Heel's Delight	Grimes Bros., Lexington, N. C.	Cochran & McLaughlin, Charlotte.
7720	Flour, White Loaf	D. S. Brill, Marlboro, Va.	Chas. Moody Co., Charlotte
7721	Flour, O. K.	----do	----do
7722	Flour, Monarch	Model Mills, Lexington, N. C.	W. J. Fite, Charlotte
7723	Flour, Our Patent	----do	----do
7724	Flour, Imperial	Jefferson Milling Co., Charlestown, W. Va.	Adams Grain and Provision Co., Charlotte.
7725	Flour, Marvel	Listman Mill Co., LaCrosse, Wis.	----do
7727	Flour, William Tell	Ansted-Burk Co., Springfield, O.	O. M. Boyd, Gastonia
7728	Flour, Monogram	Model Mill Co., Johnson City, Tenn.	J. Flem. Johnston Co., Gastonia.
7729	Flour, Silver Lake	Lake View Milling Co., Chambersburg, Pa.	F. D. Barkley & Co., Gastonia
7730	Flour, Best in the World	Michigan Milling Co., Ann Arbor, Mich.	----do
7731	Flour, Gold Leaf	Piedmont Mills, Lynchburg, Va.	----do
7734	Flour, Majestic	Knoxville City Mills, Knoxville, Tenn.	Overman & Co., Salisbury
7735	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	Peeler Grain and Provision Co Salisbury.
7736	Flour, Sleepy Eye	Sleepy Eye Milling Co., Sleepy Eye, Minn.	----do
8104	Flour, Prince of Patents	Mountain City Mills, Chattanooga, Tenn.	Hendersonville Grocery Co., Hendersonville.
8099	Flour, Eagle Patent	Glasgow Milling Co., Glasgow, Mo.	Fain-Mayfield Co., Murphy
8098	Flour, Crown	----do	----do
8100	Flour, Gem	Glasgow Milling Co., Glasgow, Mo.	Fair-Mayfield Co., Murphy
8101	Flour, Ben Hur	Hennepin Mill Co., Louisville, Ky.	----do
8102	Flour, El Dorado	Tennessee Mill Co., Estill Springs, Tenn.	----do
8103	Flour, Sifted Snow	Acme Milling Co., Talbot, Tenn.	D. S. Pace, Hendersonville
7552	Flour, White Star	Hubbard Mill Co., Mankato, Minn.	Fasnacht & Co., Charlotte
7553	Flour, Blue Ribbon	The Richards-Evans Co., Cortland, Ohio.	P. L. Woodard & Co., Wilson
7551	Flour, White Star	Geo. P. Plant Milling Co., St. Louis, Mo.	Fasnacht & Co., Charlotte
8009	Flour, Good Luck	Wells-Abbott-Newman Co., Schuyler, Neb.	Madison Grocery Co., Madison
8003	Flour, Pearl	Pearl Roller Mills, Randleman, N. C.	G. C. Lovill, Mt. Airy
8005	Flour, Pond Lily	Wachovia Mills, Winston-Salem, N. C.	Farmers Stock Co., Winston-Salem.
8004	Flour, Gold Standard	Pearl Roller Mills, Randleman, N. C.	G. C. Lovill, Mt. Airy

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
7712	Wheat product	None found	None found	Flour.
7713	do	do	do	do.
7714	do	do	do	do.
7715	do	do	do	do
7716	do	do	do	do.
7717	do	do	do	do
7718	do	do	do	do.
7719	do	do	do	do.
7720	do	do	do	do.
7721	do	do	do	do.
7722	do	do	do	do.
7723	do	do	do	do.
7724	do	do	do	do.
7725	do	do	do	do.
7727	do	do	do	do.
7728	do	do	do	do.
7729	do	do	do	do.
7730	do	do	do	do.
7731	do	do	do	do.
7734	do	do	do	do.
7735	do	Trace	Trace	do
7736	do	None found	None found	do.
8104	do	do	do	do.
8099	do	do	do	do.
8098	do	do	do	do.
8100	do	do	do	do
8101	do	do	do	do.
8102	do	do	do	do.
8103	do	do	do	do.
7552	do	do	do	do.
7553	do	Slight trace	Slight trace	do
7551	do	None found	None found	do.
8009	do	do	do	do.
8003	do	do	do	do.
8005	do	do	do	do.
8004	do	do	do	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8006	Flour, Pride of Salem	Wachovia Mills, Winston-Salem, N. C.	Farmers Stock Co., Winston-Salem.
8007	Flour, Albemarle	Wells-Abbott-Newman Co., Schuyler, Neb.	Madison Grocery Co., Madison
8008	Flour, Western Cream	---do	---do
8112	Flour, White Loaf	Keezetown Roller Mills, Keezetown, Va.	A. F. Messick Grocery Co., Winston-Salem.
8121	Flour, White Lily	Harmon & de Rundeau, Crimora, Va.	Sides & Kimball, Winston-Salem
8122	Flour, Royal Crown	Stuarts Draft Milling Co., Stuarts Draft, Va.	Allen Owen Co., Durham
8123	Flour, Lone Star	Piedmont Mills, Lynchburg, Va.	---do
8128	Flour, Hico Best	Hico Milling Co., Burlington, N. C.	M. V. Lawrence, Durham
8271	Flour, Victoria	J. T. Miller & Son, Millersburg, Ohio.	P. L. Woodard & Co., Wilson
8267	Flour, Carolina	C. Syer & Co., Norfolk, Va.	Pugh & Brooks Co., New Bern
8269	Flour, White Swan	Peninsular Milling Co., Flint, Mich.	Matthews-Weeks Co., Rocky Mt
8270	Flour, Excelsior	W. S. Jenkins & Co., Leesburg, Va.	P. A. Revis & Co., Louisburg
8279	Flour, Pick of the Harvest	Holt-Granite Flour Mills, Haw River, N. C.	Breedlove & McFarland, Oxford
8278	Flour, Virginia Daisy	Berryville Milling Co., Berryville, Va.	L. Thomas, Oxford
8277	Flour, Acme	Strasburg Flour Mills, Strasburg, Va.	---do
8275	Flour, Honeymoon	Ohio-Indiana Milling Association, Cincinnati, Ohio.	McKinne Bros. Co., Louisburg
8274	Flour, Forest King	The Dunlop Mills, Richmond, Va.	P. A. Revis & Co., Louisburg
8273	Flour, Pride of Columbia	C. A. Gambrill Mfg. Co., Baltimore, Md.	---do
8272	Flour, Anchor	Dunlop Mills, Richmond, Va.	---do
8294	Flour, Happy Valley	T. J. Lutz & Son, Lenoir, N. C.	H. T. Newland, Lenoir
8295	Flour, May Flour	---do	---do
8296	Flour, Tellico	Atlanta Milling Co., Atlanta, Ga.	---do
8297	Flour, Cyclone	Statesville Flour Mill Co., Statesville, N. C.	Morrison Provision Co., Hickory
8298	Flour, Gish's Best	H. L. Gish, Mercersburg, Penn.	J. S. Selzer & Son, Hickory
8299	Flour, White Rose	Statesville Flour Mill Co., Statesville, N. C.	Morrison Provision Co., Hickory
8300	Flour, Farmer's Choice	Rhyne Yount & Co., Newton, N. C.	F. E. Fields, Hickory
8301	Flour, Magnolia	Hickory Milling Co., Hickory, N. C.	---do
8305	Flour, Gold Hunter	Model Mills, Nashville, Tenn.	D. S. Pace, Hendersonville
8306	Flour, Majestic	Knoxville City Mills, Knoxville, Tenn.	Blanton Grocery Co., Marion
8307	Flour, Sifted Snow	Acme Milling Co., Talbot, Tenn.	McCall & Conley, Marion
8308	Flour, Monitor	Statesville Flour Mill Co., Statesville, N. C.	Gaston & Tate, Marion
8309	Flour, Snow Flake	Broadway Milling Co., Broadway, Va.	Maj. Hopper, Shelby
8311	Flour, Queen of Dixie	Banner Roller Mills, Lincolnton, N. C.	Wampum Store, Lincolnton
8312	Flour, Snow Bird	Statesville Flour Mill Co., Statesville, N. C.	---do
8313	Flour, Queen of Dixie	Banner Roller Mills, Lincolnton, N. C.	Dixie Grocery Co., Lincolnton
7956	Flour, White Rose	Acme Milling Co., Indianapolis, Ind.	S. J. Stallings, Littleton

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
8006	Wheat product	None found	None found	Flour
8007	do	do	do	do.
8008	do	do	do	do
8112	do	do	do	do
8121	do	do	do	do
8122	do	do	do	do.
8123	do	do	do	do
8128	do	0.12	Nitrite nitrogen	Flour, slightly bleached
8271	do	None found	None found	Flour.
8267	do	do	do	do.
8269	do	do	do	do.
8270	do	do	do	do
8279	do	do	do	do
8278	do	do	do	do
8277	do	do	do	do.
8275	do	do	do	do.
8274	do	do	do	do.
8273	do	do	do	do.
8272	do	do	do	do.
8294	do	do	do	do.
8295	do	do	do	do.
8296	do	do	do	do.
8297	do	Trace	Trace	do.
8298	do	None found	None found	do.
8299	do	do	do	do.
8300	do	do	do	do
8301	do	do	do	do.
8305	do	do	do	do
8306	do	do	do	do
8307	do	do	do	do.
8308	do	do	do	do.
8309	do	do	do	do.
8311	do	Trace	Trace	do
8312	do	None found	None found	do.
8313	do	do	do	do.
7956	do	do	do	do

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler	Retail Dealer or Party Who Sent Sample for Analysis.
7857	Flour, Columbia	Acme Evans Co., Indiadapolis, Ind.	S. J. Stallings, Littleton
7894	Flour, White Swan	Peninsular Milling Co., Flint, Mich.	Matthews-Weeks Co., Rocky Mt.
7895	Flour, Rob Roy	W. A. Coombs Milling Co., Coldwater, Mich.	do
7896	Flour, F. F. F. G.	A. J. Cole Milling Co., Chester, Ill.	Geo. J. Hales & Bro., Rocky Mt.
7898	Flour, Blue Ribbon	The Richards-Evans Co., Cortland, Ohio.	Sumrell & McCoy, Kinston
7900	Flour, Mt. Vernon	The Northwestern Mill and Elevator Co., Toledo, Ohio.	Armstrong Grocery Co., New Bern.
7902	Flour, Pearl	Eldred Mill Co., Jackson, Mich.	Adams Grain and Provision Co., Fayetteville.
7901	Flour, Southern Belle	Northwestern Mill and Elevator Co. Toledo, Ohio.	Armstrong Grocery Co., New Bern.
7903	Flour, Pearl	Adams Flour Co., Richmond, Va.	Adams Grain and Provision Co., Fayetteville.
7904	Flour, Uncle Sam	Saginaw Milling Co., Saginaw, Mich.	do
7905	Flour, North Star	Northwestern Mill and Elevator Co., Toledo, Ohio.	J. H. Culbreth & Co., Fayetteville.
7886	Flour, Pick of the Harvest	Holt-Granite Flouring Mills, Haw River, N. C.	H. M. Love & Son, Burlington
7887	Flour, Hico Best	Hico Milling Co., Burlington, N. C.	Stephenson Grocery Co., Burlington.
7888	Flour, Pansy	Harmon & de Rundeau, Crimora, Va.	Florence & Walker, Burlington
7889	Flour, Morning Star	Holt-Granite Flouring Mills, Haw River, N. C.	J. M. Tisdale, Burlington
7890	Flour, Pillsbury's Best	Pillsbury-Washburn Co., Minneapolis, Minn.	do
7891	Flour, Dan Valley	Dan Valley Mills, Danville, Va.	J. Isley & Bro. Co., Burlington
7892	Flour, Operator's Choice	L. Banks Holt, Graham, N. C.	do
7893	Flour, Victor	Howard Mills Co., Wichita, Kan.	Bizzell & Ormond, Goldsboro
7846	Flour, Ann Arbor	Michigan Milling Co., Ann Arbor, Mich.	do
7847	Flour, Best on Earth	Valley City Milling Co., Grand Rapids, Mich.	Baker-Bizzell Co., Goldsboro
7848	Flour, Peerless Princess	Howard Milling Co., Wichita, Kan.	do
7849	Flour	Smith Mill Co., Cireleville, Ohio	D. H. Dixon, Goldsboro.
7850	Flour, White Pearl	B. D. Booth, Petersburg, Va.	Baker-Bizzell Co., Goldsboro
7851	Flour, Peerless Princess	Howard Mills. Wichita, Kan.	W. C. Moye & Son, Goldsboro
7852	Flour, Front Rank	Bernet, Craft & Kauffman, St. Louis, Mo.	R. E. Pipkin, Goldsboro
7853	Flour, Best	Monroe City Mills, Monroe, Mich.	do
7855	Flour, Howard's Best	Howard Mill Co., Wichita, Kan.	M. J. Best & Sons, Goldsboro
7856	Flour, Best in the World	Michigan Milling Co., Ann Arbor, Mich.	B. G. Thompson, Goldsboro
7857	Flour, Southern Beauty	Mutual Milling and Supply Co., Harrisonburg, Va.	J. T. Ginn, Goldsboro
7858	Flour, Our Battleship	Mountain City Mills, Frederick, Md.	C. E. Siceloff, High Point
7859	Flour, Dan Valley	Dan Valley Mills, Danville, Va.	do
7860	Flour, Pillsbury's Best	Pillsbury Mills, Minneapolis, Minn.	P. H. Johnson, High Point
7861	Flour, Crown	Brackett & Sons, High Point, N. C.	Brackett & Sons, High Point
7862	Flour, Cresota	Northwestern Consolidated Milling Co., Minneapolis, Minn.	Scott-Sparger Co., Greensboro
7863	Flour, Dunlop's Superlative	Dunlop Mills, Richmond, Va.	do
7864	Flour, Lily White	do	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour - Milligrams.	Adulterants	Remarks and Conclusions
7957	Wheat product	None found	None found	Flour.
7894	do	do	do	do.
7895	do	do	do	do.
7896	do	do	do	do.
7898	do	do	do	do.
7900	do	0.12	Nitrite nitrogen	Flour, slightly bleached
7902	do	None found	None found	Flour.
7901	do	0.07	Trace	do.
7903	do	0.07	do	do.
7904	do	None found	None found	do.
7905	do	do	do	do.
7886	do	do	do	do.
7887	do	do	do	do.
7888	do	do	do	do.
7889	do	do	do	do.
7890	do	do	do	do.
7891	do	do	do	do.
7892	do	do	do	do.
7893	do	do	do	do.
7846	do	do	do	do.
7847	do	do	do	do.
7848	do	do	do	do.
7849	do	do	do	do
7850	do	do	do	do.
7851	do	do	do	do.
7852	do	do	do	do.
7853	do	do	do	do.
7855	do	do	do	do.
7856	do	do	do	do.
7857	do	do	do	do.
7858	do	do	do	do.
7859	do	do	do	do.
7860	do	do	do	do.
7861	do	do	do	do.
7862	do	do	do	do.
7863	do	do	do	do.
7864	do	do	do	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7865	Flour, Gold Coin	Eagle Roller Mills, New Ulm, Minn.	Patterson Bros., Greensboro
7866	Flour, Majestic	J. Allen Smith, Knoxville, Tenn.	do
7867	Flour, Piedmont	Piedmont Mills, Lynchburg, Va.	do
7868	Flour, High Tide	Lake View Roller Mills, Lynchburg, Va.	do
7869	Flour, Nonpareil	Waynesboro Mill Co., Waynesboro, Va.	Elmore Maxwell Co., Greensboro
7870	Flour, Old Sleepy Eye Cream.	Sleepy Eye Milling Co., Sleepy Eye, Minn.	W. H. Moffitt, Lexington
7871	Flour, Tar Heel's Delight	Grimes Bros., Lexington, N. C.	do
7872	Flour, Our Best	do	do
7873	Flour, Old Sleepy Cream	Sleepy Eye Milling Co., Sleepy Eye, Minn.	Peeler Grain and Provision Co., Salisbury.
7874	Flour, Tip Top	Warner Moore & Co., Richmond, Va	do
7875	Flour, Superlative	Dunlop Mills, Richmond, Va.	do
7876	Flour, Marvel	Listman Mill Co., LaCrosse, Wis.	do
7877	Flour, Majestic	J. Allen Smith Co., Knoxville, Tenn.	Overman & Co., Salisbury
7878	Flour, Lone Star	Piedmont Mills, Lynchburg, Va.	do
7879	Flour, Evidence	J. Allen Smith Co., Knoxville, Tenn.	do
7880	Flour, Purity	Salisbury Milling Co., Salisbury, N. C.	do
7881	Flour, Porcelain	Andrew Bowling, Staunton, Va.	M. P. Murphy, Salisbury
7882	Flour, Golden Grain	Concord Milling Co., Concord, N. C.	H. M. Blackwelder, Concord
7883	Flour, Golden Crown	Mountain City Mills, Frederick, Md.	G. W. Patterson, Concord
7884	Flour	Dunlop Mills, Richmond, Va.	do
7885	Flour, Snow Flake	Andrew Bowling, Staunton, Va.	Dove-Bost Co., Concord
7775	Flour, Cream of the Lake	Lake View Milling Co., Chambersburg, Pa.	Cline & Moore, Concord
7776	Flour, Don Q	Larabee Flour Mill Co., Hutchinson, Kas.	do
7777	Flour, Empress	do	do
7778	Flour, Melrose	White Star Mills, Staunton, Va.	do
8036	Flour, Big Flour	Cairo Milling Co., Cairo, Ill.	Owenby-Wofford Co., Murphy
8029	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	The West Hill Co., Mt. Airy
8143	Flour, Monitor	do	Calvert Grocery Co., Statesville
8037	Flour, Indian Head	Mountain City Mill Co., Chattanooga, Tenn.	Owenby-Wofford Co., Murphy
8028	Flour, Piedmont	Piedmont Mills, Lynchburg, Va.	The West Hill Co., Mt. Airy
8033	Flour, Copyright	Blish Milling Co., Seymour, Ind.	Asheville Grocery Co., Asheville
8038	Flour, Veach's Highest	J. M. Veach, Adairsville, Ga.	Owenby-Wofford Co., Murphy
8031	Flour, Climax	Strasburg Flouring Mills, Strasburg, Va.	Granite Mercantile Co., Mt. Airy
8039	Flour	Hennepin Mill Co., Louisville, Ky.	Jno. E. Fain, Murphy
8030	do	Strasburg Flouring Mills, Strasburg, Va.	Granite Mercantile Co., Mt. Airy
8032	Flour, Gold Coin	Eagle Roller Mills, New Ulm, Minn.	Baird Bros., Asheville

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants	Remarks and Conclusions
7865	Wheat product	None found	None found	Flour
7866	do	do	do	do
7867	do	do	do	do
7868	do	do	do	do
7869	do	do	do	do
7870	do	do	do	do
7871	do	do	do	do
7872	do	do	do	do
7873	do	do	do	do
7874	do	do	do	do
7875	do	do	do	do
7876	do	do	do	do
7877	do	do	do	do
7878	do	do	do	do
7879	do	do	do	do
7880	do	do	do	do
7881	do	do	do	do
7882	do	do	do	do
7883	do	do	do	do
7884	do	do	do	do
7885	do	do	do	do
7775	do	do	do	do
7776	do	do	do	do
7777	do	do	do	do
7778	do	do	do	do
8036	do	0.17	Nitrite nitrogen	Flour, slightly bleached
8029	do	0.10	do	do
8143	do	0.10	do	do
8037	do	None found	None found	Flour.
8028	do	do	do	do
8033	do	do	do	do
8038	do	do	do	do
8031	do	do	do	do
8039	do	do	do	do
8030	do	do	do	do
8032	do	do	do	do

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8035	Flour, Belle of Tennessee	The Morristown Mills, Morristown, Tenn.	Asheville Grocery Co., Asheville.
8034	Flour, Golden West	Wells-Abbott-Newman Co., Schuyler, Neb.	do
7906	Flour, Moore's Best	R. P. Moore Milling Co., Princeton, Ind.	Hall & Pearsall, Wilmington
7907	Flour, Copyright	Blish Milling Co., Seymour, Ind.	do
7908	Flour, Charm	Eldred Milling Co., Jackson, Mich.	do
7909	Flour, Dainty	Valliers & Spies Milling Co., Marine, Ill.	The Corbett Co., Wilmington
7911	Flour, Model Patent	Model Mill Co., Johnson City, Tenn.	W. B. Cooper, Wilmington
7910	Flour, Daisy	Valliers & Spies Milling Co., Marine, Ill.	The Corbett Co., Wilmington
7912	Flour, Stock's Best	F. W. Stock, Hillsdale, Mich.	W. B. Cooper, Wilmington
7913	Flour, Bunker Hill	W. B. Cooper, Wilmington, N. C.	do
7958	Flour, Fancy Patent	David Stotts, Detroit, Mich.	The Worth Co., Wilmington
7959	Flour, Rob Roy	W. A. Coombs Milling Co., Cold Water, Mich.	McNair & Pearsall, Wilmington
7960	Flour, Dinner Bell	F. E. Hashagen & Co., Wilmington, N. C.	F. E. Hashagen & Co., Wilmington.
7961	Flour, Tidal Wave	do	do
7962	Flour, Silver Top	Cairo Milling Co., Cairo, Ill.	A. W. King & Co., Wilmington
7963	Flour, Our Sparkle	W. A. Coombs Milling Co., Cold Water, Mich.	do
7964	Flour, White Wonder	do	do
7965	Flour, William Tell	Ansted-Burk Co., Springfield, Ohio	D. L. Gore, Wilmington
8230	Flour, Grimes' First Patent	Grimes Milling Co., Salisbury, N. C.	D. W. Jnlian, Salisbury
8255	Flour, White Flint	Dan Valley Mills, Danville, Va.	Kiser & Mauney, Kings Mtn.
8256	Flour, Cream of the Lake	Lake View Milling Co., Chambersburgh, Pa.	O. M. Boyd & Co., Gastonia
8257	Flour, Nonpareil	Waynesboro Milling Co., Waynesboro, Va.	F. D. Barkley & Co., Gastonia
8258	Flour, Belmore	F. D. Barkley & Co., Gastonia, N. C.	do
8259	Flour, Marvel	Listman Mill Co., La Crosse, Wis.	Adams Grain and Provision Co., Charlotte.
8260	Flour, Imperial	Jefferson Milling Co., Charlestown, W. Va.	do
8261	Flour, Monogram	Model Mill Co., Johnson City, Tenn.	do
8262	Flour, Dove	Antietam Mill Co., Funkstown, Md.	Johnson Bros., Charlotte
8263	Flour, O. K.	D. S. Brill, Marlboro, Va.	Chas. Moody Co., Charlotte
8264	Flour, White Rose	Concord Milling Co., Concord, N. C	do
8265	do	C. C. Bowman, Timberville, Va.	Davidson & Wolf, Charlotte
8312	Flour, Snow Bird	Statesville Flour Mill Co., Statesville, N. C.	Wampum Store, Lincolnton
8313	Flour, Queen of Dixie	Banner Roller Mills, Lincolnton, N. C.	Dixie Grocery Co., Lincolnton
8330	Flour, Cones Patent	Riverton Mills, Riverton, Va.	S. V. Tomlinson, North Wilkesboro.
8331	Flour, F. F. V.	do	do
8332	Flour, Carolina	do	F. C. Forester, North Wilkesboro
8333	Flour, White Clover	do	do

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
8035	Wheat product	None found	None found	Flour.
8034	do	do	do	do
7906	do	do	do	do.
7907	do	do	do	do
7908	do	do	do	do.
7909	do	do	do	do.
7911	do	do	do	do.
7910	do	do	do	do.
7912	do	do	do	do.
7913	do	do	do	do.
7958	do	do	do	do.
7959	do	do	do	do.
7960	do	do	do	do.
7961	do	do	do	do.
7962	do	Trace	Nitrite nitrogen	do.
7963	do	None found	None found	do.
7964	do	do	do	do.
7965	do	Trace	Nitrite nitrogen	do.
8230	do	0.55	do	Flour, bleached: sale illegal
8255	do	None found	None found	Flour.
8256	do	do	do	do.
8257	do	do	do	do.
8258	do	do	do	do.
8259	do	do	do	do.
8260	do	do	do	do.
8261	do	do	do	do.
8262	do	do	do	do.
8263	do	do	do	do.
8264	do	0.30	Nitrite nitrogen	Flour, slightly bleached
8265	do	None found	None found	Flour.
8312	do	do	do	do.
8313	do	do	do	do.
8330	do	do	do	do.
8331	do	do	do	do.
8332	do	do	do	do.
8333	do	do	do	do.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8334	Flour, Cresota	Northwestern Consolidated Milling Co., Minneapolis, Minn.	Scott-Sparger Co., Greensboro
8335	Flour, Banner	Carrolina Roller Mills, Durham, N. C.	----do
8336	Flour, Peerless	Austin-Heaton Co., Durham, N. C.	----do
8338	Flour, White Loaf	Keezetown Mills, Keezetown, Va.	J. G. Garrett Grocery Co., Winston-Salem.
8339	Flour, Primrose	Buena Vista Mills, Buena Vista, Va.	Norman-Moir-Dalton Co., Winston-Salem.
8361	Flour, Snow Drift	Williams Bros. Co., Kent, Ohio	W. B. Cooper, Wilmington
8362	Flour, Bunker Hill	W. B. Cooper, Wilmington, N. C.	----do
8363	Flour, Our Choice	Piedmont Mills, Lynchburg, Va.	----do
8364	Flour, Carolina	C. Syer & Son, Norfolk, Va.	Brown-Toon Co., Wilmington
8365	Flour, Snow Drop	Washburn-Crosby Co., Louisville, Ky.	Hall & Pearsall, Wilmington
8366	Flour, Perfection	Williams Bros., Kent, Ohio	----do
8367	Flour, Sparkler	W. A. Coombs Milling Co., Cold Water, Mich.	A. W. King, Wilmington
8368	Flour, White Wonder	----do	----do
8369	Flour, Snow Ball	F. Thoman Milling Co., Lansing, Mich.	M. J. Best & Sons, Goldsboro
8370	Flour, Lexington Cream	Cockley Milling Co., Lexington, Ohio.	J. T. Ginn, Goldsboro
7024	Flour, Star	W. A. Watson, Greensboro, N. C.	W. A. Watson, Greensboro
7228	Flour, Bouquet	Smithtown Roller Mills, Siloam, N. C.	J. M. Whittington, East Bend
7218	Flour, Queen City	Ohio-Indiana Milling Association, Cincinnati, Ohio.	E. T. Jeannette & Co., Washington.*
7261	Flour, Royall Brand	Easton Roller Mills, Easton, Md.	Crow Bros., Monroe
7281	Flour, White Rose	Statesville Flour Mill Co., Statesville, N. C.	J. A. Shuping, Morganton
7403	Flour	Nathan Travis, Newton, N. C.	N. Allen Travis, Newton*
7439	Flour, Tidal Wave	Michigan Milling Co.	F. E. Hashagen & Co., Wilmington*.
7477	Flour	Front Royal Milling Co., Front Royal, Va.	Sinclair Mercantile Co., Norwood.*
7537	Flour, "Sago"		Salisbury Cotton Mills, Salisbury.*
7732	Flour, Crystal	Salisbury Milling Co., Salisbury, N. C.	Overman & Co., Salisbury
7733	Flour, Baker's Straight	----do	----do
7739	Flour, Silver Cloud	Grimes Milling Co., Salisbury, N. C.	H. Z. White, Salisbury
7740	Flour, Grimes' First	----do	Thomspon Grain Store, Salisbury
7903	Flour, Pearl	Adams Flour Co., Richmond, Va.	Adams Grain and Provision Co., Fayetteville.
7955	Flour, Lexington Cream	The Cockley Milling Co., Lexington, Ohio.	Littletou Feed and Grocery Co., Littleton.
7897	Flour, Queen City	Ohio-Indiana Milling Co., Cincinnati, Ohio.	Nash Supply Co., Nashville
7932	Flour, Seal of Ohio	Gwinn Milling Co., Columbus, Ohio.	Greenville Supply Co., Greenville
7950	Flour, Moss Rose	Oriental Roller Mills, Lansing, Mich.	Jos. F. Tayloe, Washington
8024	Flour, Oma	Mancy Milling Co., Omaha, Neb.	Madison Grocery Co., Madison
8125	Flour, Virginia Daisy	Berryville Milling Co., Berryville, Va.	Carpenter Bros., Durham

* Sent to the Department for analysis.

TION OF FLOUR—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants	Remarks and Conclusions
8334	Wheat product	None found	None found	Flour.
8335	do	0.50	Nitrite nitrogen	Flour, bleached; sale illegal
8336	do	None found	None found	Flour.
8338	do	do	do	do
8339	do	do	do	do.
8361	do	do	do	do
8362	do	do	do	do.
8363	do	do	do	do.
8364	do	do	do	do.
8365	do	do	do	do.
8366	do	do	do	do
8367	do	do	do	do
8368	do	do	do	do.
8369	do	do	do	do.
8370	do	Trace	Trace	do.
7024	do	0.80	Nitrite nitrogen	Flour, bleached; sale illegal
7228	do	None found	None found	Flour.
7218	do	do	do	do.
7261	do	0.70	Nitrite nitrogen	Flour, bleached; sale illegal
7281	do	0.72	do	do.
7403	do	None found	None found	Flour
7439	do	do	do	do.
7477	do	do	do	do.
7537			Potato starch	Flour, containing potato starch.
7732	Wheat product	0.37	Nitrite nitrogen	Flour, bleached; sale illegal.
7733	do	0.42	do	do.
7739	do	1.00	do	do.
7740	do	1.77	do	do.
7903	do	0.37	do	do.
7955	do	0.37	do	do.
7897	do	0.37	do	do.
7932	do	0.72	do	do.
7950	do	0.56	do	do.
8024	do	1.52	do	do.
8125	do	None found	None found	Flour

RESULTS OF THE EXAMINA-

Lab. No.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8126	Flour, Peerless	Carrolina Roller Mills, Durham, N. C.	Carpenter Bros., Durham
8127	Flour, Banner	do	do
8147	Flour	Cockley Milling Co., Lexington, Ohio.	Cromer Bros., Winston-Salem
8152	Flour, William Tell	Ansted-Burk Co., Springfield, Ohio.	Norman-Moir-Dalton Co., Winston-Salem.
8205	Flour		D. S. Pace, Hendersonville*
8232	Flour, Imperial	White Star Mills, Staunton, Va.	Harris-McAulay Co., Norwood
8231	Flour, Purity	Salisbury Milling Co., Salisbury, N. C.	D. W. Julian, Salisbury
8235	Flour, White Fawn		White Morrison Flour Co., Concord.
8236	Flour, Cream of Wheat	J. Hale & Sons, Lyons, Minn.	do
8237	Flour, Family Straight	Concord Milling Co., Concord, N.C.	Cline & Moore, Concord
8238	Flour, Daisy	Foil Bros., Mt. Pleasant, N. C.	do
8239	Flour, White Rose	Concord Milling Co., Concord, N. C.	W. J. Glass, Concord
8240	Flour, City Belle	Harrisonburg Milling Co., Harrisonburg, Va.	H. L. Parks & Co., Concord
8276	Flour, Banner	Carrolina Roller Mills, Durham, N. C.	McKinne Bros. Co., Louisburg
8253	Flour, Lily of the Valley	Jefferson Milling Co., Charlestown, W. Va.	Patterson Grocery Co., Kings Mountain.
8254	Flour, Magnolia	W. A. Ware & Co., Kings Mountain, N. C.	do
8280	Flour, Our Pride	Carrolina Roller Mills, Durham, N. C.	Breedlove & McFarland, Oxford
8372	Flour, Crystal	Statesville Flour Mill Co., Statesville, N. C.	Chas. Moody Co., Charlotte
8347	Flour, New Method	For Berry O'Kelly, Method, N. C.	S. J. Betts, Raleigh
8403	Flour, Eldean	Allen-Wheeler Co., Troy, Ohio	Owenby-Wofford Co., Murphy
8405	Flour, Jack Horner	do	Fain-Mayfield Co., Murphy
8407	Flour, Marguerite	do	do
8408	Flour, Nellie King	Tennessee Mill Co., Estill Springs, Tenn.	do

*Sent to the Department for analysis.

RESULTS OF THE EXAMINATION OF

Lab. No.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7763	Flour	Carrolina Roller Mills, Durham, N. C.	
7764	do	do	
7765	do	do	
7766	do	do	
7767	do	do	
7768	do	do	
7769	do	do	
7770	do	do	
7966	do	do	
7967	do	do	
7968	do	do	

TION OF FLOUR—*Continued.*

Lab. No.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour—Milligrams.	Adulterants.	Remarks and Conclusions
8126	Wheat product	0.42	Nitrite nitrogen	Flour, bleached; sale illegal
8127	do	1.60	do	do.
8147	do	0.50	do	do.
8152	do	0.35	do	do
8205	do	None found	None found	Flour.
8232	do	None found	None found	Flour.
8231	do	0.92	Nitrite nitrogen	Flour, bleached; sale illegal
8235	do	None found	None found	Flour.
8236	do	Trace	Trace	do.
8237	do	do	do	do.
8238	do	do	do	do.
8239	do	0.52	Nitrite nitrogen	Flour, bleached; sale illegal
8240	do	None found	None found	Flour.
8276	do	0.37	Nitrite nitrogen	Flour, bleached; sale illegal
8253	do	None found	None found	Flour.
8254	do	do	do	do.
8280	do	0.42	Nitrite nitrogen	Flour, bleached; sale illegal
8372	do	Trace	Trace	Flour.
8347	do	None found	None found	do.
8403	do	do	do	do.
8405	do	do	do	do.
8407	do	do	do	do.
8408	do	do	do	do.

FLOUR FOR EXPERIMENTAL PURPOSES.

Lab. No.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour.	Bleaching Agent.	Remarks and Conclusions
7763	Wheat product	None found	None found	
7764	do	do	do	
7765	do	0.38	Nitrite nitrogen	Bleached
7766	do	0.42	do	do.
7767	do	0.40	do	do
7768	do	0.55	do	do.
7769	do	0.53	do	do.
7770	do	0.93	do	do.
7966	do	0.10	do	Slightly bleached
7967	do	0.07	do	do.
7968	do	None found	None found	

RESULTS OF THE EXAMINATION OF FLOUR

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7969	Flour	Carrolina Roller Mills, Durham, N. C.	
7970	do	do	
8283	do	Holt-Granite Mfg. Co., Haw River, N. C.	
8284	do	do	
8285	do	do	
8286	do	do	
7971	do	High Point Milling Co., High Point N. C.	
7972	do	do	
7973	do	do	
7974	do	High Point Milling Co., High Point, N. C.	
7975	do	do	
7976	Flour, No. 1	Hickory Milling Co., Hickory, N. C	
7977	Flour, No. O	do	
7978	Flour, No. A	do	
7979	Flour, No. 2	do	
7980	Flour, No. 3	do	
7981	Flour, No. 4	do	
7982	Flour, No. 5	do	
7983	Flour, No. 6	do	
7984	Flour, No. 7	do	
7985	Flour, No. 8	do	
7986	Flour, No. 9	do	
7987	Flour, No. 10	do	
7991	Flour, No. 1	High Point Milling Co., High Point, N. C.	
7992	Flour, No. 2	do	
7993	Flour, No. 3	do	
7994	Flour, No. 4	do	
7995	Flour, No. 5	do	
7996	Flour, No. 6	do	
7429	Flour, No. 1	Statesville Flour Mill Co., Statesville, N. C.	
7430	Flour, No. 2	do	
7431	Flour, No. 3	do	
7989	Flour, No. 2	do	
7990	Flour, No. 3	do	
7988	Flour, No. 1	do	
7483	Flour	Wachovia Mills, Winston-Salem, N. C.	

FOR EXPERIMENTAL PURPOSES—*Continued.*

Laboratory Number.	Microscopic Examination.	Nitrite Nitrogen Per Kilo of Flour.	Bleaching Agent	Remarks and Conclusions
7969	Wheat product	0.05	Nitrite nitrogen	Slightly bleached
7970	do	None found	None found	
8283	do	0.15	Nitrite nitrogen	Slightly bleached
8284	do	0.17	do	do
8285	do	0.25	do	do.
8286	do	0.22	do	do.
7971	do	0.48	do	Bleached
7972	do	0.67	do	do.
7973	do	0.80	do	do.
7974	do	2.00	Nitrite nitrogen	do
7975	do	0.88	do	do.
7976	do	0.40	do	do
7977	do	None found	None found	
7978	do	2.00	Nitrite nitrogen	Bleached
7979	do	0.85	do	do.
7980	do	1.02	do	do.
7981	do	2.66	do	do.
7982	do	0.80	do	do
7983	do	None found	None found	
7984	do	do	do	
7985	do	0.17	Nitrite nitrogen	Slightly bleached
7986	do	0.82	do	Bleached.
7987	do	0.75	do	do.
7991	do	0.60	do	do.
7992	do	0.70	do	do.
7993	do	0.20	do	Slightly bleached
7994	do	0.12	do	do.
7995	do	0.10	do	do.
7996	do	0.17	do	do.
7429	do	Trace	Trace	Trace of bleaching
7430	do	do	do	do.
7431	do	None found	None found	
7989	do	0.27	Nitrite nitrogen	Slightly bleached
7990	do	None found	None found	
7988	do	0.27	Nitrite nitrogen	Slightly bleached
7483	do	1.17	do	Bleached

ICE CREAM AND ICE CREAM SUBSTITUTES.

Ice cream is a frozen product made from cream and sugar, with or without a natural flavoring, and contains not less than 14 per cent of milk fat.

Fruit ice cream is a frozen product made from cream, sugar and sound, clean, mature fruits, and contains not less than 12 per cent of milk fat.

Nut ice cream is a frozen product made from cream, sugar and sound nonrancid nuts, and contains not less than 12 per cent of milk fat.

Many products, such as eggs, gelatine, etc., are used in the manufacture of so-called ice cream, which is often very palatable, but which is not ice cream, and if sold as such is a violation of the law.

The sale of a product as ice cream containing gelatine, eggs, gum tragacanth or other vegetable gums, or the sale of a product as ice cream which contains less than the required per cent of milk fat will not be contested, provided the same is labeled and sold as imitation ice cream, compound ice cream, gelatine ice cream, egg ice cream, milk ice cream or gum ice cream (as the case may be); or if a placard bearing the following statement—

Imitation ice cream is served here.
Compound ice cream is served here.
Egg ice cream is served here.
Gelatine ice cream is served here.
Milk ice cream is served here, or
Gum ice cream is served here

(as the case may be), shall be posted in a conspicuous place in the

RESULTS OF THE EXAMINATION OF ICE

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler	Retail Dealer or Party Who Sent Sample for Analysis.
7539	Ice-cream, Vanilla	H. T. Hicks Co., Raleigh, N. C.	H. T. Hicks Co., Raleigh
7540	....do	J. C. Brantley Drug Co., Raleigh, N. C.	J. C. Brantley Drug Co., Raleigh
7541	....do	A. Dughi, Raleigh, N. C.	A. Dughi, Raleigh
7542	Ice-cream, Peach	....do	....do
7543	Ice-cream, Sherry	King-Crowell Drug Co., Raleigh, N. C.	King-Crowell Drug Co., Raleigh
7544	Ice-cream, Vanilla	J. Furman Betts, Raleigh, N. C.	J. Furman Betts, Raleigh
7545	....do	California Fruit Store, Raleigh, N. C.	California Fruit Store, Raleigh.
7546	Ice-cream, Peach	J. Furman Betts, Raleigh, N. C.	J. Furman Betts, Raleigh
7594	Ice-cream, Milk	Goldsboro Drug Co., Goldsboro, N. C.	Goldsboro Drug Co., Goldsboro.
7599	Ice-cream, Vanilla	H. E. Royal, New Bern, N. C.	D. B. Wade, Jr., Morehead

room where any and all persons may see the same when purchasing cream; and, provided further, that the statement on the placard is printed in plain black letters, not less than one inch in size, on a white background.

Eighty-nine samples sold as ice cream were examined, 24 of which proved either to be standard ice cream or were sold under the regulation above mentioned, that provides for the sale of such products, and 65 proved to be below standard and were sold in violation of the law.

The milk fat in these samples ranged from 0.56 of one per cent to 24.90 per cent, and all were sold at retail at practically the same price. Is it fair competition for one dealer to sell an ice cream that contains practically 25 per cent of milk fat and another on the same block to sell a product that contains but slightly more than one-half of one per cent? But to say nothing of the competition, to allow it without the facts being made known would be a great imposition on the consuming public. Dealers can sell low-grade products if they wish, but they must make the facts known to the public. Provision is made for it in the regulation above.

In enforcing the food law the Department does not desire to make it a hardship on the dealers, but the consuming public must be protected, and to do so the law must be enforced. Dealers are hereby notified that if they wish to sell an ice cream below standard they must make the fact known to the public, as is provided by the regulation under the food law, otherwise they will be prosecuted for the violation of the law.

CREAM AND ICE CREAM SUBSTITUTES.

Laboratory Number.	Fats—Per Cent.	Solid Matter—Per Cent.	Remarks and Conclusions.
7539	24.90		Ice-cream.
7540	19.14		do.
7541	14.57		do.
7542	9.69		Ice-cream, below standard; no sign, sale illegal.
7543	17.22		Ice-cream.
7544	3.81		Compound ice-cream and so stated on sign in place where served.
7545	19.32		Ice-cream.
7546	2.70		Compound ice-cream and the fact was so stated on sign in place where served.
7594	4.11		Milk ice-cream and the fact was stated by dealer.
7599	12.34		Ice-cream, below standard; no sign, sale illegal.

RESULTS OF THE EXAMINATION OF ICE CREAM

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7600	Ice-cream, Cherry	H. E. Royal, New Bern, N. C.	D. B. Wade, Jr., Morehead
7601	Ice-cream, Lemon		E. Z. Williams, Morehead City
7604	Ice-cream, Vanilla		Louis Elipoulous, New Bern
7606	Ice-cream, Cherry		H. E. Royal, New Bern
7607	Ice-cream, Peach		do
7608	Ice-cream, Vanilla		Dennis Metrose, New Bern
7609	Ice-cream, Tutti-Frutti		H. E. Royal, New Bern
7661	Ice-cream, Peach		J. Furman Betts, Raleigh
7662	Ice-cream, Vanilla		do
7663	do		A. Dughi, Raleigh
7664	Ice-cream, Peach		do
7667	Ice-cream, Vanilla	Torrence Drug Co., Gastonia, N. C.	Adams Drug Co., Gastonia
7668	Ice-cream, Strawberry		Torrence Drug Co., Gastonia
7669	Ice-cream, Vanilla		Abernathy & Shields, Gastonia
7670	Ice-cream, Peach		do
7671	Ice-cream, Vanilla		Kenneday Drug Co., Gastonia
7672	Ice-cream, Strawberry		do
7673	Ice-cream, Vanilla		Woodall & Shepard, Charlotte
7674	Ice-cream gelatin, Peach		Tryon Drug Co., Charlotte
7675	Ice-cream, gelatin, Vanilla		do
7676	do		J. H. Hahn, Charlotte
7677	Ice-cream, gelatin, Chocolate.		do
7678	Ice-cream, Vanilla		Hamilton-Martin Drug Co., Charlotte.
7679	do		N. Saleeby, Lexington
7680	Ice-cream, Sherry		do
7681	Ice-cream	S. L. & P. A. Smith, Greensboro, N. C.	C. C. Fordham, Greensboro
7682	do		George Campbell, Greensboro
7683	Ice-cream, Vanilla		T. A. Johnson, Greensboro
7684	Ice-cream, compound, Strawberry.		J. A. Ripley, Greensboro
7685	Ice-cream, Vanilla	S. L. & P. A. Smith, Greensboro, N. C.	Z. V. Conyer, Greensboro
7686	do	do	Hennessee Cafe, Greensboro
7687	Ice-cream		J. H. West, Greensboro
7688	Ice-cream, Strawberry		Peter Chakales, Salisbury
7689	Ice-cream, Vanilla		do
7690	Ice-cream, Strawberry		A. B. Saleeby, Salisbury
7691	Ice-cream, Vanilla		do
7692	Ice-cream, egg, Peach		Chas. Maramora, Salisbury

AND ICE CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fats—Per Cent.	Solid Matter—Per Cent.	Remarks and Conclusions
7600	9.10		Ice cream, below standard; no sign, sale illegal
7601	0.56		Not ice-cream; sale illegal.
7604	7.87		Not ice-cream; no sign, sale illegal.
7606	10.21		Ice-cream, below standard; no sign, sale illegal
7607	7.24		Not ice-cream; no sign, sale illegal.
7608	7.80		do.
7609	14.71		Ice-cream.
7661	2.99		Compound ice-cream; sign up in place of business
7662	3.12		Not ice-cream; no sign, sale illegal.
7663	11.68		Ice-cream, below standard; no sign, sale illegal
7664	4.75		Not ice-cream; no sign, sale illegal
7667	5.43	21.96	do.
7668	4.70	50.06	do.
7669	3.26	18.94	do.
7670	3.80	23.43	do.
7671	4.38	24.61	do.
7672	6.15	33.70	do.
7673	9.65	29.80	Ice-cream, below standard; sale illegal
7674	8.49	30.88	Ice-cream, gelatin, below standard; sign
7675	8.57	31.38	do.
7676	6.66	33.32	Compound ice-cream, gelatin, below standard; sign
7677	7.11	32.28	do.
7678	7.55	29.67	do.
7679	2.18	25.46	Not ice-cream; no sign, sale illegal
7680	2.48	26.58	do.
7681	7.32	30.72	Compound ice-cream, below standard; sign
7682	3.47	27.12	Not ice-cream; no sign, sale illegal.
7683	2.71	23.46	do.
7684	1.71	27.84	Compound ice-cream; sign.
7685	7.42	30.75	Compound ice-cream, below standard; no sign, sale illegal
7686	7.35	35.77	Compound ice-cream; no sign, sale illegal.
7687	3.73		Compound ice-cream; sign
7688	16.17		Ice-cream
7689	14.06		do.
7690	5.49		Compound ice-cream; no sign, sale illegal.
7691	8.29		Ice-cream, below standard; no sign, sale illegal
7692	5.01		do.

RESULTS OF THE EXAMINATION OF ICE CREAM

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis
7693	Ice-cream, gelatin, Walnut		Smith's Drug Store, Salisbury
7694	Ice-cream, Peach		A. B. Saleeby, Salisbury
7695	Ice-cream, Vanilla		J. H. West, Greensboro*
7696	....do		N. Saleeby, Lexington
7697	Ice-cream, Strawberry		....do
7698	Ice-cream, Vanilla		H. Kyrios, High Point
7700	Ice-cream, Peach		Asheville Pharmacy, Asheville
7701	Ice-cream, Vanilla		C. A. Walker, Asheville
7702	....do		C. A. Raysor, Asheville
7703	....do		W. C. Carmichael, Asheville
7704	....do		Smith's Drug Store, Asheville
7705	....do		H. L. Fisher, Asheville
7706	....do		Riverside Refreshment Co., Asheville.
7997	....do		C. E. King & Sons, Durham
7998	....do		Haywood & Boon, Durham
7999	....do	Smith & Smith, Durham	A. H. Michaels, Durham
8000	....do		W. M. Yearby Co., Durham
8108	....do		Jos. Capaloli, Hendersonville
8109	....do		Hunter Pharmacy, Hendersonville.
8110	....do		W. H. Justus, Hendersonville
8111	....do		George Pilalos, Hendersonville
8113	Ice-cream, Peach		J. D. Helms, Winston-Salem
8114	Ice-cream, Vanilla		....do
8115	....do		P. J. Brame, Winston-Salem
8116	....do		E. W. O'Hanlon, Winston-Salem.
8117	....do		G. J. Messick, Winston-Salem
8118	....do		Geo. Mitry, Winston-Salem
8119	Ice-cream, Strawberry		....do
8120	Ice-cream, Chocolate		....do
8281	Ice-cream, compound		E. R. & F. S. Thomas, Durham
8348	Ice-cream, Vanilla		Mavronicolas Bros., Wilmington
8349	....do		Jos. Stephano, Wilmington
8350	Ice-cream, Chocolate		J. Hicks Bunting, Wilmington
8351	Ice-cream, Vanilla		Jos. D. Stephano, Wilmington
8352	....do	J. W. Plumer, Wilmington, N. C.	John Phillips, Wilmington
8353	....do		N. Kostdos, Wilmington

*Sent to the Department for analysis.

AND ICE CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fats—Per Cent.	Solid Matter—Per Cent.	Remarks and Conclusions
7693	8.38		Ice cream, below standard; no sign, sale illegal
7694	8.57		do.
7695	12.05		Ice-cream, below standard; sign
7696	2.84		Compound ice-cream; no sign, sale illegal
7697	2.43		do.
7698	9.86		Ice-cream, below standard; no sign, sale illegal
7700	16.14	39.40	Ice-cream.
7701	9.85	27.59	Ice-cream, below standard; no sign, sale illegal
7702	15.88	33.98	Ice-cream.
7703	9.57	20.18	Ice-cream, below standard; no sign, sale illegal
7704	8.25	26.87	do.
7705	2.97	21.75	Compound ice-cream; no sign, sale illegal.
7706	10.18	29.50	Ice-cream, below standard; no sign, sale illegal
7997	3.36	24.28	Not ice-cream; no sign, sale illegal.
7998	4.12	24.50	do.
7999	11.66	30.30	Ice-cream, below standard; no sign, sale illegal
8000	3.79	24.02	Not ice-cream; no sign, sale illegal.
8108	7.28	32.47	Compound ice-cream; no sign, sale illegal
8109	3.73	29.33	do.
8110	8.42	18.83	Ice-cream, below standard; no sign, sale illegal
8111	2.03	33.04	Compound ice-cream; no sign, sale illegal.
8113	6.26	30.97	do.
8114	8.38	24.91	Ice-cream, below standard; no sign, sale illegal
8115	7.48	34.60	Compound ice-cream; no sign, sale illegal
8116	8.77	29.43	do.
8117	1.74	21.27	do.
8118	6.19	29.89	do.
8119	6.09	26.07	do.
8120	5.85	31.83	do.
8281	1.30	19.84	Compound ice-cream; sign up
8348	4.49		Compound ice-cream; no sign, sale illegal
8349	3.57		do.
8350	4.35		do.
8351	3.53		do.
8352	8.24		Ice-cream, below standard; no sign, sale illegal
8353	3.95		Compound ice-cream; no sign, sale illegal.

RESULTS OF THE EXAMINATION OF ICE CREAM

Laboratory Number.	Material and Brand from Label	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8354	Ice-cream, Vanilla		Jno. W. Plumer, Wilmington
8355	do		E. Denos, Wilmington
8356	do		do
8357	do		Xanthos Bros., Wilmington
8358	do		E. Warren & Son, Wilmington
8359	do		R. F. Warren, Wilmington

LEMON EXTRACTS AND LEMON EXTRACT SUBSTITUTES.

Oil of lemon, from which the extract is made, is produced in Sicily and other Mediterranean countries from the rind of lemons. The best grades are made by simply expressing and clarifying, and the cheaper ones by distilling the oil from the rind.

The extract, which is a 5 per cent (by volume) solution of the oil in alcohol, colored with lemon peel, is made as follows: Dissolve 50 cc. of the oil of lemon in 900 cc. of deodorized alcohol, add the lemon peel and macerate for twenty-four hours; filter through paper and add, through the filter, enough alcohol to make the volume up to 1,000 cc.

The ingredients from which lemon extract is made cost probably less than one-third of the price at which it is retailed. Notwithstanding the liberal margin for profit, even when the best materials are used, lemon extract is subject to the grossest forms of adulteration. The cost of the alcohol in a lemon extract is about four-fifths of the total cost of a good extract. That being the case, the manufacturer naturally seeks to reduce the amount of alcohol used; but lemon oil, being almost insoluble in weak alcohol, to reduce the strength of the latter necessarily reduces the amount of lemon oil present.

Low-grade extracts are often adulterated or reinforced by the addition of such substances as citral, oil of citronella and oil of lemon

AND ICE CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fats—Per Cent.	Solid Matter—Per Cent.	Remarks and Conclusions
8354	5.07		Compound ice-cream; no sign, sale illegal
8355	3.34		do.
8356	3.73		do.
8357	4.91		do.
8358	7.75		Ice-cream, below standard; no sign, sale illegal.
8359	5.10		Compound ice-cream; no sign, sale illegal.

grass. These materials are very pungent and have to be used in small quantities. They are, however, a very poor substitute for lemon flavor.

Many of these products are labeled compound, and dealers often insist that the compound is practically as good as the real extract, and consumers are induced to buy them at the same or practically the same price as the real extract. For the benefit of the consuming public we desire to say that such statements are untrue, and usually the dealer knows that they are untrue. Consumers are hereby cautioned against the purchase of compounds, imitations, etc., for which they are paying the price of a first-class article.

Forty-two samples of lemon extracts and lemon extract substitutes were examined, 15 of which proved to be standard extracts, while 26, or nearly 62 per cent, were either adulterated or misbranded, and one was not properly labeled.

By reference to the table following it will be seen that some of these products contained no lemon oil at all, while others contained as much as 8.40 per cent.

The law requires that a lemon extract shall contain not less than 5 per cent (by volume) of lemon oil. In the future violations of the law will be prosecuted.

RESULTS OF THE EXAMINATION OF LEMON

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8046	Lemon Extract, Bee Brand	McCormick & Co., Baltimore, Md.	L. C. Wooten, Fayetteville
8059	Lemon Extract, Colonial	Asheville Wholesale Co., Asheville, N. C.	Z. V. Hardin, Rutherfordton
8303	---do	Asheville Wholesale Drug Co., Asheville, N. C.	Asheville Wholesale Drug Co., Asheville.
8048	Lemon Extract	R. R. Bellamy, Wilmington, N. C.	W. W. McCarthy, Lumberton
8049	---do	---do	---do
8187	---do	Justice Drug Co.,Greensboro, N. C.	Justice Drug Co., Greensboro
8342	---do	---do	---do
8360	---do	Robt. R. Bellamy, Wilmington, N. C.	Robt. R. Bellamy, Wilmington
8073	Lemon Extract, Vicks Triangle.	Justice Drug Co., Greensboro, N. C.	Tussey & Koontz, Lexington
8071	Lemon Extract, Our Seal	Vaughn-Crutchfield Co., Wiuston-Salem, N. C.	Hahn-Honeycutt Co., Concord
8072	---do	---do	D. M. Miller & Son, Salisbury
8074	---do	---do	R. F. Leonard, Lexington
8241	---do	---do	Vaughn-Crutchfield Co., Winston-Salem.
8340	---do	---do	Farmers Stock Co., Winston-Salem.
8078	Lemon Extract, Eagle	Webb Manufacturing Co., Nashville, Tenn.	Morrison Bros., Wadesboro
8245	Lemon Extract, Hoyts	---do	A. F. Messick Grocery Co., Charlotte.
8315	---do	---do	---do
8044	---do	Ahrens Bros., Wilmington, N. C.	J. C. Bell, Dunn
8047	Ext. of Terpeneless Lemon	Greever-Lotspeich Mfg. Co., Knoxville, Tenn.	A. S. Melvin Co., Fayetteville
8051	Lemon Extract, Nabob	Francis H. Leggett & Co., New York, N. Y.	Jno. Morrison, Rockingham
8050	Lemon Extract, Premier	---do	---do
8052	Lemon Extract, Phœnix	W. H. Crawford Co., Baltimore, Md.	A. P. Barrett, Rockingham
8053	Lemon, Citral Flavor	Stokes-Grimes & Co., Richmond,	Mills & Colson, Wadesboro
8054	Lemon Extract, C. C. C.	Clotworthy Chemical Co., Baltimore, Md.	W. W. Pinkston, Wadesboro
8056	Lemon Flavor, American	American Extract Co., Cincinnati, Ohio.	Bridgers & Co., Charlotte
8057	Lemon Extract, Van Duzers,	Van Duzer Extract Co., New York, N. Y.	S. H. Youngblood, Charlotte
8058	Lemon Extract, Bastine's Pure Extract.	Bastine & Co., New York, N. Y.	---do
8060	Lemon Extract	Haynes Bottling Works, Rutherfordton, N. C.	Z. V. Hardin, Rutherfordton
8061	Lemon Extract, Kitchen Queen.	Interstate Chemical Co., Baltimore, Md.	J. B. Long, Forest City
8062	Lemon Extract, Peacock	Bristol Mfg. Co., Bristol, Va.-Tenn.	Florence Mills Department Store Forest City, N. C.
8064	Lemon Extract, Kitchen Queen.	Interstate Chemical Co., Baltimore, Md.	J. A. Chance, Laurinburg
8064 a	---do	---do	---do
8063	Lemon Extract	Manney Drug Co., King's Mountain, N. C.	Kiser & Mauney, Kings Mountain.
8067	Lemon Extract, Souders	Royall Remedy and Extract Co., Dayton, Ohio.	Wampum Store, Lincolnton
8069	Lemon Extract, Red Ribbon.	Interstate Chemical Co., Baltimore, Md.	McDaniel & Roberts, Kings Mountain.
8070	Lemon Extract	G. W. Patterson, Concord, N. C.	W. J. Glass, Concord
8233	---do	Colgate & Co., New York, N. Y.	Harris & McCauley, Norwood

EXTRACTS AND LEMON EXTRACT SUBSTITUTES.

Laboratory Number.	Oil of Lemon—Per Cent (by Volume).	Reading refractometer at 30° C.	Remarks and Conclusions.
8046	8.4	67	Lemon extract.
8059	0.0	----------	Imitation lemon extract, adulterated; misbranded, sale illegal
8303	1.5	67	Lemon extract, adulterated, below standard; sale illegal.
8048	4.4	67	do.
8049	4.8	67	Lemon extract, adulterated, slightly below standard; sale illegal.
8187	5.0	67	Lemon extract.
8342	6.4	67	do.
8360	7.2	67	do.
8073	0.0	----------	Imitation lemon extract, adulterated; misbranded, sale illegal
8071	4.0	66	Lemon extract, adulterated, below standard; sale illegal.
8072	4.2	67	do.
8074	3.5	67	do.
8241	4.6	67	do.
8340	3.2	67	do.
8078	1.0	67	do.
8245	4.6	67	do.
8315	5.2	67	Lemon extract.
8044	4.6	67	Lemon extract, adulterated, below standard; sale illegal.
8047	0.0	----------	Extract of terpeneless lemon.
8051	1.2	72	Lemon extract, adulterated, below standard: sale illegal.
8050	2.8	67	do.
8052	5.4	67	Lemon extract.
8053	0.0	----------	Lemon citral flavor; not properly labeled, sale illegal.
8054	5.0	67	Lemon extract.
8056	0.0	----------	Imitation lemon flavor; misbranded, sale illegal.
8057	8.4	67	Lemon extract.
8058	6.0	67	do.
8060	0.0	----------	Imitation lemon flavor, adulterated; misbranded, sale illegal.
8061	4.8	67	Lemon extract, adulterated, below standard; sale illegal.
8062	3.4	66.5	do.
8064	2.5	67	do.
8064a	4.6	67	do.
8068	0.0	----------	Imitation lemon flavor, adulterated; misbranded, sale illegal.
8067	0.0	----------	do.
8069	8.8	67	Lemon extract.
8070	4.4	67	Lemon extract, adulterated, below standard; sale illegal.
8233	7.6	67	Lemon extract.

RESULTS OF THE EXAMINATION OF LEMON EXTRACT

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8234	Lemon Extract	C. E. Sauer Co., Richmond, Va.	Harris & McCauley, Norwood
8246	....do	Mauney Drug Co., Kings Mountain, N. C	Mauney Drug Co., Kings Mountain.
8302	Lemon Extract ,Hance's	R. A. Hance Co., Philadelphia, Pa.	J. A. Groves, Asheville
8314	Lemon Flavor, Imperial	Imperial Chemical Co., Johnson City, Tenn.	J. W. Lawing, Marion
7489	Imitation Lemon Extract	Frank Tea and Spice Co., Cincinnati, Ohio.	F. M. Hubbard, Laurinburg

MILK AND CREAM.

Milk is the fresh, clean, lacteal secretion obtained by the complete milking of one or more healthy cows properly fed and kept, excluding that obtained within fifteen days before and ten days after calving, and contains not less than 8.5 per cent of solids, not fat, and not less than 3.25 per cent milk fat. Blended milk is milk modified in its composition so as to have a definite and stated percentage of one or more of its constituents.

Skim-milk is milk from which a part or all of the cream has been removed, and contains not less than 9.25 per cent of milk solids.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7427	Cream		A. Dughi, Raleigh*
7428	....do		....do
7478	Skim Milk	S. C. Von Gottschalk, Raleigh, N. C.	S. C. VonGottschalk, Raleigh*
7479	Milk	....do	....do
7480	Cream	....do	....do
7481	....do		A. Dughi, Raleigh*
7482	....do	R. H. Gower, Clayton, N. C.	R. H. Gower, Clayton*
7500	Milk		H. W. Nobles, Greensboro*
7562	Milk, Breast		W. S. Covington, Lenoir*
8040	Milk, Skim, Condensed	Hires Condensed Milk Co., Philadelphia, Pa.	Dr. W. S. Rankin, Raleigh*
8184	Milk		J. G. Smith, Guilford College*
8185	Cream		....do
8186	Milk		W. C. Bain, Greensboro

*Sent to the Department for analysis.

AND LEMON EXTRACT SUBSTITUTES—*Continued.*

Laboratory Number.	Oil of Lemon—Per Cent—(by Volume).	Reading refractometer at 30° C.	Remarks and Conclusions
8234	5.4	67	Lemon extract.
8246	5.0	67	do.
8302	2.7	67	Lemon extract, adulterated, below standard; sale illegal.
8314	0.0	.....	Imitation lemon extract, adulterated; misbranded; sale illegal
7489	0.0	.....	Imitation lemon extract.

Cream is that portion of milk, rich in milk fat, which rises to the surface of milk on standing, or is separated from it by centrifugal force, is fresh and clean, and contains not less than 18.00 per cent of milk fat.

Seventeen samples were examined, 15 of which were standard in quality and two were below standard; the latter, however, were sent to the Department for analysis, and there is nothing to indicate that they were offered for sale.

All official samples were standard and no adulteration was found.

TION OF MILK AND CREAM.

Laboratory Number.	Fat—Per Cent.	Solid Matter—Per Cent.	Adulterants.	Remarks and Conclusions
7427	13.09	.....	Milk	Cream, below standard; sale illegal.
7429	15.10	.....	do	do.
7478	0.52	.....	None found	Skim milk, milk from which a part of the fat has been removed.
7479	5.35	.....	do	Milk.
7480	25.85	.....	do	Cream.
7481	24.65	.....	do	do.
7482	20.71	.....	do	do.
7500	.....	.....	do	Milk, was examined for preservatives, none found
7562	7.05	15.05	do	Milk, breast.
8040	3.40	.....	None found	Milk, skim, condensed; milk, condensed after part of the fat had been removed.
8184	4.00	.....	do	Milk.
8185	18.50	.....	do	Cream.
8186	4.80	.....	do	Milk.

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
8250	Milk		H. D. Kirkpatrick, Charlotte
8251	do		Jno. A. Berryhill, Charlotte
8252	do		M. O. Dowd, Charlotte
8373	Milk, Breast		R. M. Williams, Inez

MISCELLANEOUS SAMPLES.

Under this head is reported the results of a few samples, most of which were sent to the Department for analysis.

RESULTS OF MISCELLANEOUS

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7484	Honey	W. D. Null	R. L. Wolff, Pinnacle*
8161	Sard nes	Ronnebergs Preserving Co., Stavanger, Norway.	J. L. Pinkston, Wadesboro
7561	Sugar		Mrs. Lonnie Bodie, High Point*
7711	do	Federal Sugar Refining Co., New York, N. Y.	Tom Pemberton, Greensboro
7665	Whiskey, Rye		Dr. Paul Payne, Asheville*
7666	Whiskey, Corn		do
8226	Honey, Gold Leaf	Huntington Maple Sugar and Syrup Co., E. Providence, R. I.	Pace & McQueen, Maxton*
8224	Honey	C. H. W. Weber, Cincinnati, Ohio	J. L. Pinkston, Wadesboro*
8317	Lard, Shield	Armour & Co.	F. J. Adams, Raeford*
7485	Wine		J. M. Hall, Mayor, Roseboro*
8042	Preserving Powder	Woodall & Sheppard, Charlotte, N. C.	Woodall & Sheppard, Charlotte

*Sent to the Department for analysis.

MOLASSES AND SIRUPS.

Molasses is the product after separating the sugar from massecuite, melada, mush sugar or concrete.

Molasses that is compounded or mixed with glucose, or any other substance, to cheapen or lower its quality, must be labeled molasses compound or imitation molasses, or it must name the ingredients in the compound.

As Cuba, Porto Rico, Mayaguez, Antigua, Barbadoes, St. Kitts, etc., are names of either West India Islands or towns and cities on

OF MILK AND CREAM—*Continued.*

Laboratory Number.	Fat—Per Cent.	Solid Matter—Per Cent.	Adulterants	Remarks and Conclusions.
8250			None found	Milk.
8251	4.20		do	do.
8252	4.80		do	do.
8373	6.69	13.85	do	Milk, breast.

Being only a few samples of each kind, for convenience they are grouped under the head of miscellaneous samples, and the results are published in the table below.

SAMPLES EXAMINED.

Laboratory Number.	Adulterants.	Remarks and Conclusions.
7484	None found	Honey.
8161	do	Sardines preserved with olive oil.
7561	Saltpetre	Sugar containing saltpetre.
7711	None found	Sugar.
7665	Neutral Spirits	Compound rye whiskey, natural and artificial color and flavor
7666	do	Imitation corn whiskey.
8226	None found	Honey.
8224	do	do.
8317	do	Lard.
7485		Imitation wine.
8042		Preserving powder, largely salicylic acid; use in food, illegal.

those islands, molasses must not be branded any of these or any other distinctive name of a place unless it is actually produced from the place named.

As it appears that the word "style," used in connection with the brand name of molasses, as "Barbadoes Style," etc., is misleading and deceptive, it must not be used with the brand name of molasses.

Sugar-cane sirup is sirup made by the evaporation of the juice of the sugar-cane or by the solution of sugar-cane concrete.

Sorghum sirup is sirup made by the evaporation of sorghum concrete.

Molasses, molasses compounds, sirups, compound sirups, etc., must be labeled what they are.

Whatever is required on the principal label of a package of molasses, molasses compound, sirup or compound sirup, must appear on one end or head of the barrel or cask; and if the principal label, or any part of it, appears on both ends of the barrel or cask they shall

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7143	Molasses, Mixed	Blackburn-Morris Co., New Orleans, La.	D. Cummings & Co., Tarboro
7144	....do	E. R. Mixon & Co., Washington, N. C.	E. R. Archbell, Washington
7145	Molasses, Compound	....do	D. M. Carter, Washington
7146	Molasses, Compound	Powell & Co., Baltimore, Md.	M. F. Archbell, Washington
7147	....do	F. G. Paul & Bro., Washington, N. C.	F. G. Paul & Bro., Washington.
7148	Molasses	Blackburn-Morris Co., New Orleans La.	Pamlico Grocery Co., Washington.
7149	....do	Powell & Co., Baltimore, Md.	E. K. Willis, Washington
7150	Molasses, Sugarhouse	Jno. B. Meyers, New Orleans, La.	A. J. Cox & Co., Washington
7151	Molasses	H. M. Jenkins & Co., Washington, N. C.	T. B. Adams & Co., Washington.
7152	....do	Powell & Co., Baltimore, Md.	Jos. F. Tayloe, Washington
7153	....do	J. H. LeRoy & Co., Elizabeth City, N. C.	J. M. LeRoy & Co., Elizabeth City.
7154	Molasses, Country	Evans-Cox, Elizabeth City, N. C.	Eagle Grocery Co., Elizabeth City.
7155	Molasses, New Orleans	Aydlett Bros. & Co., Elizabeth City, N. C.	Aydlett Bros. & Co., Elizabeth City.
7156	....do	Henry L. Hobart, New York, N. Y.	M. P. Gallop & Co., Elizabeth City,
7158	....do	Dixie Molasses Co., New Orleans, La.	J. G. Fearing, Elizabeth City
7159	Molasses	Mangles Herald Co., Baltimore, Md.	S. W. Willis, New Bern
7160	....do	Blackburn-Morris Co., New Orleans, La.	Hudson & Co., New Bern
7161	....do	....do	Lucas & Lewis, New Bern
7162	....do	....do	Broad Street Grocery Co., New Bern.
7163	....do	C. S. Hollister, New Bern, N. C.	....do
7165	....do	C. W. Antrim & Sons, Richmond, Va.	Bizzell & Ormond, Goldsboro
7166	....do	....do	....do
7167	Sirup, White Clover	H. L. Hobart, New York, N. Y.	....do
7348	Sirup	C. C. Covington, Wilmington, N. C.*	
734[illegible]	....do	....do	
8203	Molasses, Extra	....do	
8204	Sirup, Fancy	....do	
8205	....do	....do	

*Sent to the Department for analysis.

be identical, one to the other. Retail dealers, while offering molasses for sale, must keep the label so that it can be seen by purchasers, and so kept that it will remain legible. Molasses, molasses compounds, sirups, compound sirups, etc., must be truthfully labeled.

Forty-seven samples of molasses were examined, and the results of the examination are published in the table below. By reference to the table it will be seen that the amount of water present ranges from 20.32 per cent to 28.80 per cent.

OF MOLASSES AND SIRUPS.

Laboratory Number.	Water—Per Cent	Adulterants.	Remarks and Conclusions.
7143	27.74		Molasses, mixed.
7144	27.90		Molasses.
7145	28.15		Molasses, compound
7146	23.34		do.
7147	26.23		do.
7148	26.96		Molasses.
7149	23.49		do.
7150	22.37		Molasses, sugarhouse
7151	25.61		Molasses.
7152	25.65		do.
7153	26.06		do.
7154	26.53		do.
7155	26.87		do.
7156	25.09		do.
7158	26.51		Molasses, compound
7159	26.73		do.
7160	25.80		do.
7161	25.73		do.
7162	28.03		do.
7163	26.09		do.
7165	28.46		do.
7166	26.41		do.
7167	23.90		Sirup.
7348	21.40		Sirup, sugar.
7348a	20.32		Sirup.
8203	24.29		Molasses.
8204	31.61		do.
8205	26.21		do

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler	Retail Dealer or Party Who Sent Sample for Analysis.
8206	Sirup, Sugar	C. C. Covington, Wilmington, N. C.	
8207	Molasses	do	
8208	Molasses, Trinidad	do	
8209	Molasses, Porto Rico	do	
8210	Molasses, Common	do	
8211	Molasses, D. B. S.	do	
8212	Molasses	do	
8213	do	do	
8214	Sirup, Sugar	do	
8215	Molasses, Black Strap	do	
7349	Molasses	do	Barnes Grocery Co., Raleigh*
8223	Sirup Compound, Morning Glory.	The Georgia Syrup Co., Jacksonville, Fla.	J. B. Godwin, Monroe
8225	Molasses, Aunt Dinah	Penick & Ford, New Orleans, La.	A. B. Fisher, Lumberton
8227	Sirup Compound, La Belle.	Gibbs Preserving Co., Baltimore, Md.	Elmond M. Tart, Dunn
8228		W. H. Robinson, Cairo, Ga.	T. J. Young, Salisbury
8320	Molasses, Orla	Penick & Ford, New Orleans, La.	McLaurin & Shaw, Laurinburg
7426	Cocoanut Sirup, Garrows	Geo. Garrow, Asheville, N. C.	Geo. Garrow, Asheville
7699	do	do	do

*Sent to the Department for analysis.

MAPLE SIRUP.

Sirup is the sound product made by purifying and evaporating the juice of a sugar-producing plant without removing any of the sugar.

Maple sirup is sirup made by the evaporation of maple sap or by the solution of maple concrete, and contains not more than 32.00 per cent of water and not less than 0.45 per cent of maple sirup ash.

Formerly maple sirup was adulterated with or substituted by glucose sirup, etc., the maple flavoring being imitated by the addition of an extract of maple, hickory or some other bark with a similar flavor; but for some years the chief adulteration has consisted in the addition of refined sugar sirup, the maple sirup present being depended on to flavor the whole, though the maple flavor is often reinforced by the addition of an extract of bark or an imitation flavor.

MOLASSES AND SIRUPS—*Continued.*

Laboratory Number.	Water—Per Cent.	Adulterants.	Remarks and Conclusions.
8206	21.56		Sirup sugar.
8207	25.96		Molasses.
8208	25.60		do.
8209	25.76		do.
8210	25.02		do.
8211	26.44		do.
8212	28.69		do.
8213	27.26		do.
8214	22.45		Sirup, sugar.
8215	28.80		Molasses.
7349	23.45		do.
8223	28.55	None found	Sirup, compound of corn and cane sirup.
8225	25.62	do	Molasses containing sulphur dioxide; not properly labeled, sale illegal.
8227	20.56	do	Sirup, compound corn sirup and small amount of cane sirup
8228	27.61	do	Sirup, cane.
8320	27.76	do	Molasses.
7426			Compound sirup, adulterated; misbranded, sale illegal.
7699			do.

Since pure maple sirup consists largely of ordinary sugar, the direct detection of added sugar sirup is, of course, impossible, but its presence is easily shown by the determination of minor constituents which occur in maple products only. With basic lead acetate a copious precipitate, in proportion to the amount of the maple product present, is deposited.

Seven samples of maple sirup and maple sirup substitutes were examined, two of which were found to be true maple sirups unadulterated; four were adulterated with cane sugar sirup, and one was labeled so as to indicate its compound nature.

It was claimed by the dealers that they had had these adulterated sirups on hand for a long time, probably before the National Food Law went in effect.

RESULTS OF THE EXAMINATION OF MAPLE

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
6364	Sirup, Scudder's	Scudder's Sirup Co., Chicago, Ill.	Sockwell Bros., Greensboro.
6348	Maple Sirup, Sunbeam	Austin Nichols & Co., New York, N. Y.	P. H. Johnson, High Point.
6347	Maple Sirup, Westmoreland.	D. B. Scully Sirup Co., Westmoreland, N. H.	Sockwell Bros., Greensboro.
6346	Maple Sirup, Our Best	Goodwin Preserving Co., Louisville, Ky.	....do.....
8319	Maple Sirup, Vermont Maple Sirup.	Knadler & Lucas, Louisville, Ky.	Cash Grocery Store, Monroe
8318	Maple Sirup	Hirsch Bros. & Co., Louisville, Ky.	W. T. Williams, Rockingham
8222	Maple Sirup, Green Mountain.	Welch Bros. Maple Co., Burlington, Vt.	L. C. Wooten, Fayetteville.

TABLE AND COOKING OILS.

Olive oil is the oil obtained from the sound, mature fruit of the cultivated olive tree. It is a very choice table oil and is largely used. It was formerly much adulterated, but the enforcement of the food laws has reduced the adulteration of it to a minimum. Cooking oils are usually highly refined cotton-seed oils that are becoming very popular.

RESULTS OF THE ANALYSIS OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis
7215	Olive Oil, Bartoni		Thos. Chapman, Clinton*
7216	Olive Oil	Lekas & Drivas, New York City	....do*
8154	Peanut Oil, Delft	Franco-Dutch Oil Works, Delft, Holland.	A. S. Melvin, Fayetteville.
8155	Salad Oil	P. J. Ritter Conserve Co., Philadelphia, Pa	McClean Bros., Gastonia.
8156	Olive Oil, Reliable	McCormick & Co., Baltimore, Md.	Carpenter Bros., Kings Mountain.
8157	Cooking Oil, Wesson	Kuester-Pharr Co., Charlotte, N. C.	Dove-Bost Co., Concord.
8158	Olive Oil	R. C. Williams & Co., New York, N. Y.	L. C. Wooten, Fayetteville.
8159	Olive Oil, Pompeiian	Fleming-Christian Co., Richmond, Va.	K. B. Terry & Co., Hamlet
8160	Olive Oil, Ternay	R. C. Williams, New York, N. Y.	W. N. Jeans, Wadesboro.

*Sent to the Department for analysis.

SIRUP AND MAPLE SIRUP SUBSTITUTES.

Laboratory Number.	Water—Per Cent.	Total Solids—Per Cent.	Ash—Per Cent.	Lead Number (Wiuton).	Adulterants.	Remarks and Conclusions.
6364			0.18	0.24		Sirup compound.
6348			0.60	1.31	None found	Maple sirup.
6347			0.11	0.22	Cane sirup	Sirup compound; adulterated, sale illegal.
6346			0.11	0.04	do	do.
8319	34.30	65.70	0.17	0.48	do	do.
8318	31.46	68.50	0.43	1.14	do	do.
8222	38.00	62.00	0.67	1.19	None found	Maple sirup.

Nine samples of oils were examined, 6 of which were olive, 1 peanut and 2 cotton-seed oils. In them no adulteration was found, but 2 samples, Nos. 7215 and 8159, were not properly labeled.

Dealers are cautioned about offering for sale food products not properly labeled.

TABLE AND COOKING OILS.

Laboratory Number.	Specific Gravity at 15.5°C.	Reading Refractometer.	Refractive Index.	Adulterants.	Remarks and Conclusions.
7215	.91515			None found	Olive oil; not properly labeled, does not show name and address of importer, manufacturer or jobber.
7216	.91595			do	Olive oil.
8154	.916	68.12	1.4713	do	Peanut oil.
8155	.923	73.91	1.4747	do	Cotton-seed oil.
8156		66.99	1.4704	do	Olive oil.
8157	.922	73.53	1.4744	do	Cotton-seed oil.
8158	.916	67.49	1.4707	do	Olive oil.
8159	.916	67.70	1.4710	do	Olive oil; not properly labeled, does not show name and address of manufacturer or jobber.
8160	.916	67.72	1.4710	do	do.

SODA WATERS, BOTTLED.

Bottled soda waters are made by the addition of water to a sirup prepared for the purpose, and carbonating the same by forcing carbon dioxide gas into it. The bottling process is comparatively simple, and while many of the bottlers of the State are intelligent men, much of the bottling business is in the hands of men of so little intelligence that they do not comprehend the law or realize the great danger to which the health of the public may be subjected from the bottling of soft drinks under insanitary conditions, to say nothing of the objectionable material that may go into the product. Many cases of fever and other diseases may originate from the contaminated water used by one bottling plant. It is realized that inspection should be made of all such plants, and that they should be required to be operated in a sanitary condition, so that they would not endanger the health and lives of the people; but funds with which to do the work are not available.

The quality of bottled soda waters varies greatly. While a few of them are made from wholesome products, many of them are made

RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.
7629	Soda Water, Lemon Sour	Groves Bottling Works, Asheville, N. C.
7630	Soda Water, Strawberry	do
7388	do	H. S. Haskell, Asheville, N. C.
7389	Soda Water, Gingerale	H. S. Haskell, Asheville, N. C.
7390	Soda Water, Strawberry	do
7391	do	do
7394	Soda Water, Lemon Sour	do
7395	Soda Water	Pepsi-Cola Bottling Co., Asheville, N. C.
7396	Soda Water, Gingerale	do
7397	Soda Water, Lemon Sour	do
7399	do	Pepsi-Cola Bottling Co., Hendersonville, N. C.
7398	do	Hendersonville Bottling Plant, A. Hontz, Hendersonville, N. C.
7622	Soda Water, Iron Beer	W. B. Yoder, Asheville, N. C.
7623	Soda Water, Pineapple	do
7624	Soda Water, Peach	do
7625	Soda Water, Strawberry	do
7626	Soda Water	do
7627	Soda Water, Strawberry	do
7628	Soda Water, Blood Orange	do

from so-called flavoring extracts that are not extracts at all, but are artificial or chemical compounds. With many of them it would be difficult to prove that they are really poisonous in the small amount used, but there is hardly any question but what the body would be far better off without them.

The labels for these drinks are usually furnished by the manufacturer of the sirup or flavoring from which the drink is made, and they try very hard to make the label misleading and still stay within the requirement of the law. As the manufacturer of the sirup or flavoring and the labels does not ship the finished product into the State, he can not be held for misbranding under the national law. For this reason the bottler of a product will have to be held strictly responsible for his products under the State law.

Fifty-one samples of these products were examined; many of them were misbranded and not properly labeled, and were, therefore, sold in violation of the law. Bottlers are hereby notified and cautioned that in the future they will be held strictly responsible for misbranding, etc., of their products.

OF SODA WATERS, BOTTLED.

Laboratory Number.	Retail Dealer or Party Who Sent Sample for Analysis.	Remarks and Conclusions.
7629	Groves Bottling Works, Asheville	Soda water, imitation lemon flavor; not properly labeled.
7630	....do	Soda water, imitation strawberry flavor; not properly labeled.
7388	M. B. Taylor, Asheville	Soda water, imitation peach flavor; not properly labeled.
7389	....do	Soda water, gingerale; not properly labeled.
7390	....do	Soda water, imitation strawberry flavor and color; not properly labeled.
7391	....do	do.
7394	W. L. Barnett, Asheville	Soda water, lemon sour, artificial lemon flavor; not properly labeled.
7395	J. H. Rea, Asheville	Soda water; not properly labeled.
7396	....do	Soda water, gingerale; not properly labeled.
7397	....do	Soda water, lemon sour, imitation lemon flavor and color; not properly labeled.
7399	A. Kilpatrick, Hendersonville	do.
7398	....do	do.
7622	W. J. Postell, Asheville	Soda water; misbranded, not a beer, sale illegal.
7623	....do	Soda water, imitation pineapple flavor; not properly labeled.
7624	....do	Soda water, imitation peach flavor; not properly labeled.
7625	....do	Soda water, imitation strawberry flavor and color; misbranded, not properly labeled, sale illegal.
7626	....do	Soda water, imitation strawberry flavor and color, not properly labeled.
7627	....do	Soda water, imitation strawberry flavor and color; not properly labeled, misbranded, sale illegal.
7628	....do	Soda water, imitation orange flavor and color; not properly labeled.

RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.
7707	Soda Water, Lemon Sour	W. B. Yoder, Asheville, N. C.
7708	Soda Water, Banana	do
7392	Soda Water, Root Beer	do
7393	Soda Water, Cream Soda	do
7631	Soda Water, Cobb's Koko Punch	J. R. Cobb, Brevard, N. C.
7632	Soda Water, Imitation Grape	Scales-Wilson Co., Greenville, S. C.
7633	Soda Water, Root Beer, Good Luck	Brevard Bottling Works, Brevard, N. C.
7634	Soda Water, Gingerale, Good Luck	do
7635	Soda Water, Lemon	do
7636	Soda Water, Gingerale, Cascade	B. W. Marshall, Hendersonville, N. C.
7639	Soda Water, Jersey Creme	Red Top Bottling Works, North Wilkesboro, N. C.
7640	Soda Water	Jno. F. Fuller, Mount Airy, N. C.
7641	Soda Water, Jersey Creme	Red Top Bottling Works, North Wilkesboro, N. C.
7642	Soda Water	Littleton Bottling Works, Littleton, N. C.
7643	Soda Water, Cascade	do
7644	Soda Water, Lemon Soda	do
7645	Soda Water, Sarsaparilla	do
7646	Soda Water	Edgecombe Bottling and Ice-cream Works, Rocky Mount, N. C.
7647	do	do
7648	do	do
7649	do	Blenheim Bottling Works, Blenheim, S. C.
7650	do	do
7652	Soda Water, Ryola	T. J. Price, Monroe, N. C.
7653	Soda Water, Rainbow	do
7651	Soda Water	Haynes Bottling Works, Rutherfordton, N. C.
7654	Soda Water, Pepsi-Cola	Kings Mountain Bottling Co., Kings Mountain, N. C.
7655	Soda Water	Parker Bottling Works, Laurinburg, N. C.
7656	do	do
7657	do	
7658	Soda Water, Champagne Cider	T. W. Parker, Laurinburg, N. C.
7659	Soda Water	do
7660	Champagne Cider	do

SODA WATERS, BOTTLED—*Continued.*

Laboratory Number.	Retail Dealer or Party Who Sent Sample for Analysis.	Remarks and Conclusions.
7707	W. J. Postell, Asheville	Soda water, imitation lemon flavor and color; not properly labeled.
7708	W. B. Yoder, Asheville	Soda water, imitation banana flavor and color; not properly labeled, misbranded, sale illegal.
7392	M. B. Taylor, Asheville	Soda water, root beer.
7393	----do	Soda water, imitation vanilla flavor and color; misbranded, not properly labeled, sale illegal.
7631	R. S. Fuller & Co., Brevard	Soda water, koko punch; not properly labeled.
7632	----do	Soda water, imitation grape flavor; not properly labeled.
7633	Brevard Bottling Works, Brevard	Soda water, root beer.
7634	----do	Soda water, gingerale.
7635	----do	Soda water, imitation lemon flavor; not properly labeled.
7636	C. C. Bryson, Hendersonville	Soda water, gingerale; not properly labeled.
7639	A. E. Spainhour, North Wilkesboro	Soda water, artificial flavor; misbranded, sale illegal.
7640	J. F. Fuller, Mount Airy	do.
7641	Red Top Bottling Works, North Wilkesboro.	do.
7642	H. E. Walker, Littleton	Soda water, artificial flavor and color; misbranded, not properly labeled, sale illegal.
7643	----do	Soda water, gingerale.
7644	----do	Soda water, imitation lemon flavor; misbranded, not properly labeled, sale illegal.
7645	----do	Soda water, sarsaparilla.
7646	W. C. Proctor, Rocky Mount	Soda water, compound gingerale; misbranded, not properly labeled, sale illegal.
7647	----do	Soda water, imitation vanilla flavor; misbranded, not properly labeled, sale illegal.
7648	----do	Soda water, imitation lemon flavor; misbranded, not properly labeled, sale illegal.
7649	R. A. Strickland, Maxton	Soda water, imitation vanilla flavor; was not labeled, illegal.
7650	----do	Soda water; misbranded, not properly labeled, sale illeggal
7652	L. N. Presson, Monroe	Soda water; not properly labeled.
7653	----do	Soda water, gingerale.
7651	M. B. McDaniel, Rutherfordton*	Soda water, compound gingerale; misbranded, sale illegal.
7654	McGinnis Bros., Kings Mountain	Soda water, Pepsi-Cola; not properly labeled.
7655	R. P. Lane, Laurinburg	Soda water; not labeled, sale illegal.
7656	----do	do.
7657	----do	Soda water, Coca-Cola.
7658	S. L. Penny, Laurinburg	Soda water, imitation champagne cider; misbranded, not properly labeled, sale illegal.
7659	----do	Soda water; not labeled.
7660	G. C. Clark, Laurinburg	Soda water, imitation champagne cider; misbranded, not properly labeled, sale illegal.

TEA.

Tea is the leaves and leaf buds of a shrubby plant "Thea," of which there are two distinct varieties, considered by some to be separate species. The tea was first known and cultivated in China, then in Japan, and later in India, Ceylon, Java, Brazil and other countries, and while the teas from India and Ceylon are now coming into extensive use, China and Japan are still the leading tea-producing countries of the world.

Both green and black tea are products of the same plant, the difference in color and flavor being due to the methods of preparation. To prepare green tea the leaves are dried by artificial heat immediately after picking, thus preserving the chlorophyl, or green coloring matter. When a black tea is desired, the leaves are subjected, before drying, to a fermentation, which changes the color to black and develops the characteristic flavor.

The alkaloid of tea, theine, is identical with that of coffee, caffeine, and to this principle are due the stimulating properties of both.

Before food laws were enacted, tea, like many other food products,

RESULTS OF THE EX-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Reatil Dealer or Party Who Sent Sample for Analysis.
5736	Tea, Echo	Bennett-Sloan & Co., New York, N. Y.	S. R. Lentz, Charlotte
5737	Tea, Sunbeam	Austin Nichols & Co., New York, N. Y.	
5738	Tea, Tetleys	Jos. Tetley & Co., New York, N. Y.	S. R. Lentz, Charlotte
5739	Tea, White House	Dwinell-Wright Co., Boston, Mass.	do
5740	Tea	do	do
5741	Tea, O and O	O. and O. Tea Co. New York, N.Y.	L. L. Sarratt, Charlotte
5742	Tea, Banquet	McCormick & Co., Baltimore, Md.	E. W. Paddison, Mt. Airy
5743	Tea, He-No	Martin Gillett & Co., Baltimore, Md.	do
5744	Tea, Mun-Ki	C. W. Antrim & Sons, Richmond, Va.	do
5745	Tea, Tempo	Levering Coffee Co., Baltimore, Md.	Dove-Bost Co., Concord
5746	Tea, Pinehurst	Pinehurst Tea Gardens, Summerville, S. C.	do
5747	Tea, Jumbo	Levering Coffee Co., Baltimore, Md.	McKee & Son, Lincolnton
5748	Tea, White Rose	Seeman Bros., New York, N. Y.	T. J. Young & Co., Salisbury
5749	Tea, Tetleys	Jos. Tetley & Co., New York, N. Y.	Vernon Grocery Co., Winston-Salem.
5752	Tea, Blanks Grant-Cavin		Kinston Peanut Co., Kinston
5753	Tea, Silvermoon	Martin Gillett & Co., Baltimore, Md.	Royall Grocery Co., Goldsboro

was much adulterated, but the condition has much improved and the adulteration of tea is disappearing.

There are several forms of adulteration of tea practiced. Exhausted tea leaves and the leaves of other plants as well as some other materials, such as soapstone, gypsum, etc., are added to tea to make weight and as a polishing agent. After foreign matter, which reduces its strength, has been added to tea, artificial strength is given it by the addition of catechu and some other materials rich in tannin.

Much of the tea on the market is faced or coated to impart a gloss and an attractive color. If that coating or coloring concealed damage or inferiority it would, under the law, be clearly an adulteration, but otherwise it is a disputed question. However, it appears to be a senseless custom, and as it increases the cost of production without improving the product, the practice should be discontinued.

Sixteen samples of tea were examined, all of which appeared to be of standard quality and no adulteration was found. One sample, No. 5752, was not properly labeled. It should show name and address of packer.

AMINATION OF TEA.

Laboratory Number.	Ash—Per Cent.	Matter Insoluble in Boiling Water.	Adulterants.	Remarks and Conclusions.
5736	5.27	50.27	None found	Tea, black.
5737	5.66	48.48	do	Tea, green and black.
5738	5.63	47.96	do	do.
5739	5.80	50.19	do	Tea blend.
5740	4.99	52.51	do	Tea, green and black.
5741	5.49	57.35	do	Tea, black.
5742	5.92	43.36	do	Tea, blend.
5743	6.15	48.72	do	Tea, black.
5744	5.23	52.81	do	Tea, blend.
5745	6.04	54.50	do	do.
5746	5.17	51.04	do	Tea, black.
5747	6.04	47.26	do	Tea, mixed.
5748	5.86	43.39	do	Tea, black and green.
5749	5.45	45.45	do	do.
5752	5.60	43.46	do	Tea, black and green; not properly labeled, package does not bear name and address of packer, sale illegal.
5753	5.78	50.23	do	Tea, blend.

VINEGAR.

Vinegar is the product made by the alcoholic and subsequent acetous fermentation of the juice of apples, is lævo-rotary, and contains not less than 4.00 per cent of acetic acid, not less than 1.60 per cent of apple solids, of which not more than 50.00 per cent are reducing sugars, and not less than 0.25 per cent of apple ash.

Wine vinegar is the product made by the alcoholic and subsequent acetous fermentation of the juice of grapes, and contains not less than 4.00 per cent of acetic acid, not less than 1.00 per cent of grape solids, and not less than 0.13 per cent of grape ash.

Malt vinegar is the product made by the alcoholic and subsequent acetous fermentation, without distillation, of an infusion of barley malt or cereals whose starch has been converted by malt, is dextro-rotary, and contains not less than 4.00 per cent of acetic acid, not less than 2.00 grams of solids, and not less than 0.2 per cent of ash.

Distilled spirit vinegar is the product made by the acetous fermentation of dilute distilled alcohol, and contains not less than 4.00 per cent acetic acid.

The subject of vinegar has been discussed at considerable length in previous reports of this Department, to which, for information not found here, the reader is referred.

Vinegar, on long standing, exposed to the air, deteriorates and loses more or less of its acidity and should, therefore, be kept protected from the air.

RESULTS OF THE EXAM-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7503	Vinegar	Burr Manufacturing Co., Richmond, Va.	J. P. Cooke, Fayetteville
7520	....do	....do	J. F. Powers & Son., Fayetteville
7513	Vinegar, Everybody's Vinegar, distilled.	Knadler & Lucas, Louisville, Ky.	Richardson & Co., Monroe
7511	Vinegar, Malt	Monroe Bottling Co., Monroe, N. C.	Monroe Bottling Co., Monroe
7530	....do	....do	K. B. Terry, Hamlet
7510	Vinegar	T. J. Price Bottling Works, Monroe, N. C.	Cash Grocery Store, Monroe
7521	Vinegar, O. H. Sirup	Old Homestead Manufacturing Co., Richmond, Va.	A. L. Tew, Fayetteville
7528	....do	....do	Liles & Sanders, Hamlet
7506	Vinegar	R. M. Hughes & Co., Louisville, Ky.	A. P. Barrett, Rockingham
7508	Vinegar, Monogram	....do	J. E. C. Hill, Wadesboro
7516	....do	....do	J. L. Allen, Rutherfordton
7522	....do	....do	M. A. Bethune, Fayetteville
7524	....do	....do	W. D. Wright, Laurinburg

Besides vinegar, the product made from apple cider, the standards under the food law recognize five other products that can be sold as vinegar, provided the word vinegar is accompanied by the name of the class to which the product belongs; as malt vinegar, wine vinegar, sugar vinegar, glucose vinegar, or distilled spirit vinegar; but to comply with the law, a product to be sold as "vinegar" must be a product made from apple cider. The sale, as vinegar, of products not made from apple cider, seems to be one of the most prevalent forms of violation of the food laws, and dealers are cautioned that while there is malt vinegar, distilled spirit vinegar, etc., there is but one "vinegar" that can be sold as "vinegar," and that is a product made from apple cider. The sale of anything else as "vinegar" is a violation of the law and will be prosecuted.

Under the head of vinegar 33 samples were examined, 10 only of which proved to be properly branded and labeled, and not adulterated or misrepresented. Two of the 33 were not properly labeled, and 21 or 63.63 per cent of them were adulterated, misbranded or misrepresented, and sold in violation of the law.

The Department has spent a great deal of time and money trying to cause the dealers to know and to comply with the requirements of the law, but from the above results it appears that dealers have not taken heed, and the Department will be obliged to prosecute violations.

INATION OF VINEGAR.

Laboratory Number.	Ash—Per Cent.	Solid Matter in Solution—Per Cent.	Acidity (Acetic Acid)—Per Cent.	Sodium Bicarbonate.	Remarks and Conclusions.
7503		0.72	4.04	No change	Distilled spirit vinegar, colored; not as represented, sale illegal.
7520		0.16	3.64	do	Distilled spirit vinegar, below standard; not as represented, sale illegal.
7513		0.27	4.16	do	Distilled spirit vinegar, colored.
7511		0.22	4.27	do	Distilled spirit vinegar, colored; not as represented, sale illegal.
7530		0.19	3.33	do	Distilled spirit vinegar, colored, below standard; not as represented, sale illegal.
7510		0.18	2.52	do	Distilled spirit vinegar, colored, below standard; not as represented, sale illegal.
7521		0.61	4.74	do	Sirup vinegar.
7528		0.56	3.50	Slightly darker	Sirup vinegar, below standard; sale illegal.
7506	0.22	1.73	3.63	Darker	Vinegar, below standard; sale illegal.
7508		0.72	4.16	Dark	Compound vinegar; misrepresented, sale illegal.
7516		0.52	4.34	Slightly darker	Compound vinegar; not as represented, sale illegal.
7522		1.93	4.92	do	Vinegar.
7524		0.68	4.22	do	Compound vinegar; not as represented, sale illegal.

RESULTS OF THE EXAMINA-

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
7529	Vinegar	R. M. Hughes & Co., Louisville, Ky.	L. M. Caldwell, Lumberton
7486	....do	....do	D. T. Johnson & Son, Raleigh
7501	Vinegar, Distilled	Southern Drug Co., Norfolk, Va.	Smith & Cole, Dunn
7507	Vinegar Blend, Royal Blend.	E. S. Shelby Vinegar Co., Richmond, Va.	Dockery-Porter Co., Rockingham.
7487	Vinegar		D. T. Johnson & Son, Raleigh
7502	Vinegar, distilled, Gold Seal	Alart & McGuire, New York, N. Y.	H. L. McMillan & Co., Fayetteville.
7504	Vinegar		W. W. McArthur, Lumberton
7505	....do		McNair & Stagner, Rockingham
7512	Vinegar, Distilled	Heath Morrow Co., Monroe, N. C.	S. B. Hart, Monroe
7514	Vinegar	W. I. Henderson, Charlotte, N. C.	W. N. Burkhead, Charlotte
7515	....do	C. Valaer, Charlotte, N. C.	C. D. Shelby, Charlotte
7517	....do	Asheville Bottling Works, Asheville, N. C.	C. S. Hemphill, Forest City
7518	....do	Kuester-Pharr Co., Charlotte, N. C.	McGill Bros. Co., Kings Mt.
7519	....do	G. W. Patterson, Concord, N. C.	Troy's Store, Concord
7523	....do		W. J. Wishart, Lumberton
7525	Vinegar, Distilled		McLaurin & Shaw, Laurinburg
7526	Vinegar, Country	Harris-Rowe Co., Port Norfolk, Va.	G. J. Jacobs, Laurinburg
7527	Vinegar	D. J. Gregory Vinegar Co., Richmond, Va.	J. F. McNair, Laurinburg
7531	....do	Fleming & Christian Co., Richmond, Va.	E. N. Rhodes, Hamlet
8043	....do	Board-Armstrong Co., Alexandria, Va.	Thomas Howard Co., Durham*

* Sent to Department for analysis.

TION OF VINEGAR—*Continued.*

Laboratory Number.	Ash—Per Cent.	Solid Matter in Solution—Per Cent.	Acidity (Acetic Acid)—Per Cent.	Sodium Bicarbonate.	Remarks and Conclusions.
7529		2.30	4.75	Black	Vinegar.
7486	0.24	1.57	3.50	do	Vinegar, below standard; sale illegal.
7501		0.27	3.19	No change	Distilled spirit vinegar, below standard: sale illegal.
7507	0.14	1.34	4.09	Slightly darker	Compound vinegar; misbranded, sale illegal.
7487	0.16	0.79	3.28	Dark	Compound vinegar, below standard; misrepresented, sale illegal.
7502		0.14	4.03	No change	Distilled spirit vinegar, colored; not properly labeled.
7504	0.25	2.62	1.23	Black	Vinegar, below standard; sale illegal.
7505		0.25	4.47	No change	Distilled spirit vinegar, colored; not as represented, sale illegal.
7512		0.27	4.03	do	Distilled spirit vinegar, colored.
7514		1.72	4.49	Black	Vinegar.
7515		0.24	3.85	No change	Distilled spirit vinegar, colored, below standard; not properly labeled, sale illegal.
7517	0.36	2.18	4.65	Black	Vinegar.
7518		1.67	4.52	do	do.
7519		0.18	4.18	No change	Distilled spirit vinegar, colored; misrepresented, sale illegal.
7523	0.18	1.38	4.03	Dark	Compound vinegar; misrepresented, sale illegal.
7525		0.21	4.87	No change	Distilled spirit vinegar, colored; not properly labeled.
7526		0.56	4.14	Slightly darker	Compound vinegar; not as represented, sale illegal.
7527	0.41	2.24	4.55	Black	Vinegar.
7531		0.59	4.43	Slightly darker	Compound vinegar; misrepresented, sale illegal.
8043	0.35	2.12	4.49	Black	Vinegar.

LEAF TOBACCO SALES FOR NOVEMBER, 1910.

Pounds sold for producers, first hand	11,794,544
Pounds sold for dealers	287,690
Pounds resold for warehouses	800,802
Total	12,886,036

INDEX