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Indiana.

Purdue University Agricultural Experiment Station

ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 170, February 10, 1911

Results of Tests of Varieties of Oats, 1910

The oats variety test conducted by the Purdue University Agricultural Experiment Station in 1910 followed along the same general plan as in former years. Some of the varieties that had been tested five years or longer were dropped and a number of new ones were added. The following table shows, in the first column, the yields produced in bushels per acre in 1910, and in the last column the average yields for the last five years, except where otherwise indicated. The varieties are placed in alphabetical order regardless of their relative yields.

The yields of all varieties have been corrected according to the yields of neighboring check plots to offset slight variations in soil fertility. The Swedish Select variety was used for all check plots, of which there were 10, and the yield recorded for this variety is the average of all the checks.

The field upon which the test was conducted was corn stubble land of medium texture and rather less than medium fertility. The ground was prepared for sowing by double disking and harrowing. The seed was sown with an ordinary two horse wheat drill at the rate of two and one-half bushels per acre on March 23 and 24, except Nos. 13 and 14, which were late coming to hand and were sown on April 1.

Varieties	Yields 1910, bushels per acre	Average yields 1906-10, bushels per acre
1 Black Egyptian	37.6	[1]37.9
2 Canadian Cluster	27.1	[1]30.5
3 Daubeney	30.7	[2]42.2
4 Emperor William	49.6	[2]42.9
5 Garton's No. 364	27.6	[1]25.7
6 Garton's No. 396	31.3	[1]33.7
7 Garton's No. 436	40.2	[1]36.9
8 Garton's No. 572	47.8	[1]39.8
9 Garton's No. 691	27.3	[1]27.6
10 Golden Fleece	41.9	42.3
11 Great Dakota	42.2	43.8
12 Great Northern	39.5	[1]35.2
13 Kirsche's Original	36.7	
14 Mammoth White Side	46.6	
15 National	37.2	37.9
16 New Sensation	39.8	[1]39.7
17 Peerless	36.8	[1]37.7
18 President	44.8	
19 Regenerated Swedish Select	39.5	[2]39.2
20 Roosevelt	36.4	
21 Schance	46.3	[1]44.8
22 Senator	17.3	
23 Silver Mine	34.3	41.9
24 Sparrowbill	33.7	[2]34.1
25 Swedish Select	39.7	39.4
26 University No. 6	46.4	[3]41.7
27 University No. 26	39.1	
28 Victor	32.0	
29 Welcome	41.2	44.0
30 White Bedford	46.6	[2]42.9
31 White Belyak	36.9	[2]36.4
32 White Bonanza	35.6	[1]34.8
33 White Plume	24.4	[2]34.9
34 White Tartar King	28.9	[1]30.4
Average	37.1	

[1]Average last two years

[2]Average last three years

[3]Average last four years

(OVER)

In time of maturity there was a period of nine days between the earliest and latest of the varieties, but 85 per cent. of them ripened within four days of each other, from July 15 to 18. No. 12 ripened on the 10th, No. 3 on the 12th, and may be classed as early. Nos. 9 and 24 were not ripe until the 19th.

In the following table are shown the five year average yields of the 10 leading varieties of oats out of about 75 tested by the Station during the last eight years.

Varieties	Yields in bushels per acre
1 Great Dakota	52.1
2 Czar of Russia	51.7
3 Big Four	51.4
4 Silver Mine	50.5
5 Gold Mine	50.3
6 Green Mountain	49.9
7 Lincoln	49.9
8 Black Tartarian	49.7
9 Black Diamond	49.3
10 Northern White Star	49.3

A summary of all the varieties tested during the last five years in the cooperative tests conducted throughout the state is shown in the following table.

Varieties	Yields in bushels per acre
1 [1]Great American	39.4
2 Silver Mine	36.9
3 Great Dakota	36.7
4 [1]Regenerated Swedish Select	36.4
5 Czar of Russia	34.9
6 Swedish Select	34.5
7 Early Champion	27.0

[1]Tested only one year, 1910

Cooperative experiments, including four or five of the leading varieties will be continued this year and any Indiana farmer who may be interested in taking part, should apply to the undersigned for particulars.

The Station has no seed oats of any kind for sale but can tell where good seed of several of the leading varieties may be obtained. Too much dependence should not be placed upon the yields of a single season and those desiring to select new varieties for general sowing should look to the five year average yields shown in the second and third tables.

A. T. Wiancko,
Chief in Soils and Crops

To the Editor:—Please credit both Station and Author with this bulletin.

Arthur Goss, Director

Indiana.

Purdue University Agricultural Experiment Station

ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 171, February 18, 1911

ARE YOU TESTING YOUR SEED CORN?

It would be interesting to know how many farmers in Indiana are still neglecting to make germination tests of their seed corn and are going by guess as to its vitality. How many farmers who had a poor stand of corn last year blamed it on the weather or on the condition of the soil, when in reality they planted seed that was poor in vitality? To make a germination test and make sure that only strong, vigorous seed is used is the only safe and sane thing to do.

Every poor ear of corn that is shelled for the planter means a great loss in the crop to be harvested next fall. It doesn't take a very large ear per stalk to make a big corn harvest, if there is a full stand. One poor ear per acre in the corn planted means a loss of approximately eight per cent. in the crop and such a loss means a lot of money for each farm and many millions of dollars on the corn crop of the state. Judging from samples at corn shows there is much frozen corn and a lot that is more or less mouldy among that which is intended for seed in the State of Indiana this year. The mouldy kernels will not be hard to detect but many germs that have been injured by frost will not be detected by the eye, and the only safe way to select is by making germination tests. The thing is easily done and there is plenty of time to do it. The whole process of testing each ear by itself need not cost more than five cents per acre in the way of labor involved. It's the most practical and profitable work the farmer can do. If you haven't been doing it, try it.

The following instructions for making a tester and conducting the test can easily be followed by any handy man.

Take ordinary inch lumber and make a shallow tray of convenient size, say about two feet by three feet, and two and one-half inches deep. Then bore small holes through the sides and ends about one and one-half inches above the bottom and about an inch and three-quarters apart. Through these holes string light galvanized or copper wire in both directions. Then fill up the tray to the wires with sand, earth or fine sawdust. Sand is preferred because it is clean and easily kept in good condition. **Each square marked off on the surface by the cross wires is intended for the kernels from a single ear of corn.** Instead of weaving in the cross wires as indicated, a piece of large meshed, wire chicken fence may be fastened in. If this is preferred, the tray should be made one and one-half inches deep, then the piece of chicken fence fastened on top and an inch strip nailed on top of that so as to

raise the edges of the tray an inch above the wire netting, as in the other case. After the tray has been filled up to the wire with sand or other material as directed above and thoroughly moistened, the tester is ready for use. If much corn is to be tested, several of these testers should be provided. They are easily made and with good care will last many years. For the average farmer one will be sufficient, as about three bushels of seed ears can be tested at one time.

When making tests, some convenient system of arranging the ears on a floor, table, shelf or rack must be employed, so that the ear corresponding to a certain square in the tester may be readily located. Begin filling the tester by placing five kernels from the first ear, selected by taking one from each of five different parts of the ear, in the first square at the upper left hand corner and fill each row of squares in regular order.

After the kernels have been placed, the material in the tester must be kept thoroughly moist. Some kind of covering must be used to keep the surface from drying and if this is properly done, the kernels need not be buried out of sight. Panes of glass or a glass window sash make the most satisfactory cover. This should rest loosely on the edges of the tester so as to admit some air. With such a cover, the soil need be moistened only once for each test, as the evaporated moisture will condense on the under surface of the glass and drop down again. When moistening is necessary after the kernels have been placed, a towel or other cloth should be spread on the surface and the water poured gently on top. If this is not done, the water poured on will move many of the kernels out of place. The cloth is then removed.

The tester should be placed in a room ranging around 70 degrees F. in temperature during the day and not falling below 50 at night. The ordinary living room is a good place for it but it should not be placed too near the stove. All kernels which do not send out vigorous root and stem sprouts within FIVE DAYS, under these conditions, should be considered as too weak to germinate properly under ordinary field conditions. If the germination of any lot of kernels is unsatisfactory, the ear from which they came should be discarded. About 95 per cent. of the kernels should germinate strongly within the five days.

A handy person can easily make an individual ear test of five or six bushels in a day and the labor involved will be paid for many times over in the better stand of plants and the consequently larger crop secured. You cannot afford to neglect it.

A. T. Wiancko,
Chief in Soils and Crops

To the Editor:—Please credit both Station and Author with this bulletin.

Arthur Goss, Director

Indiana.

Purdue University Agricultural Experiment Station

ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 172, March 3, 1911

COOPERATIVE EXPERIMENTS WITH FIELD CROPS

Farmers in Indiana desiring to test a few of the leading varieties of either corn, oats, soy beans or cow peas this season should apply at once to the Soils and Crops Department, Experiment Station, Lafayette, Ind., to have their names put on the list for a set of seeds. The Department's seed supplies are limited and only a few lots can be sent to each county. The seeds are furnished free of cost on condition that they be carefully tested side by side, and the results reported after harvest.

Summaries of the results of last year's tests, together with the average results for the last five years are being published in bulletin form.

During the last five years 3731 tests on nearly as many farms, and averaging over 40 to the county, were conducted and the results are highly valuable as a guide to the selection of varieties for different parts of the state.

The following recommendations as to the choice of varieties are based upon the results of the extensive tests above referred to.

Corn—For northern and northeastern counties:—Early Yellow Dent, Wabash Yellow Dent, Dunn's Yellow Dent and Anson's White Dent.

For the north central counties:—Reid's Yellow Dent, Hudson's Leaming, Pulaski County Golden Dent, Riley's Favorite and Silver Mine.

For central Indiana:—Reid's Yellow Dent, Leaming and Boone County White.

For south central and southern Indiana:—Johnson County White Dent, Vogler's White Dent, Pride of Indiana, Alexander's Gold Standard and Johnson County Yellow.

Oats—Great Dakota, Silver Mine, Swedish Select and probably Great American.

Soy Beans—For northern Indiana: —Early Brown and Ito San.

For central Indiana:—Hollybrook, Early Brown and Ito San.

For southern Indiana:—Hollybrook and Medium Early Yellow.

Cow Peas—For northern Indiana:—Early Blackeye, Whippoorwill, Michigan Favorite and New Era.

For southern Indiana:—If for seed production, the same varieties as for northern Indiana. If for forage production, the Iron and Clay will be found best.

The Station has no seeds of any kind for sale but can tell where good seed for each section of the state may be procured.

A. T. Wiancko,
Chief in Soils and Crops

To the Editor:—This bulletin will interest many farmers and should be published at once, if possible.

Arthur Goss, Director

Indiana.

Purdue University Agricultural Experiment Station

ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 173, March 10, 1911

WHAT ABOUT OAT SMUT THIS YEAR?

Formalin Seed-treatment Prevents It

Were your oats attacked by smut last year? Are you using those oats for seed? If so, the formalin seed-treatment should be applied to such oats before sowing, even if only a small amount of smut was present, in order to prevent the disease in this year's crop.

Oat smut causes an enormous annual loss, the country over, and Indiana's share is much too great. It should, and can be prevented.

Cause and Nature of the Disease

Oat smut is a disease caused by a microscopical organism, a fungus, which entirely destroys the heads of the affected plants. This fungus lives and grows within the tissues of the affected oat plants, entirely invisible from without until the diseased plants begin to head out. The smut fungus then enters the young "would be" kernels and destroys both them and the accompanying chaff, and masses of worthless black, powdery material are produced instead. These powdery masses consist of innumerable, minute spores (corresponding to seeds) of the smut fungus. These smut spores are blown about by the wind to sound kernels of the healthy oat plants near by, and remain on them ready to take advantage of the situation when such oats are used for seed. When such oats are sown, the attached smut spores germinate under the same conditions and at the same time that the oat kernels do, and the fungus, by its very minute, tube-like growth, penetrates into the tissues of the very young oat plant. Here the fungus thrives, drawing its nourishment from its host, and grows up within the oat plant through the season. When the latter heads out, the heads are entirely destroyed. The kernels and chaff are largely, if not entirely, changed to black, powdery masses, the spores of the fungus. These spores are thus ready to be blown about to sound oat kernels and carry the disease to the next year's crop.

The Remedy

It is clear, then, that the point of attack is in the seed. If the seed oats can be so treated as to kill the smut-fungus spores clinging to them and yet not injure the growing quality of the oats themselves, then such a treatment is successful and should be applied to seed oats wherever there is danger from smut. Both in specially conducted experiments and in ordinary farm practice, the formalin seed treatment has been repeatedly found to fulfill both of these requirements admirably. It not only has the merit of being highly efficient, but it is safe, inexpensive, and easy of application. The treatment is as follows:

Formalin Seed Treatment

After the seed oats are well cleaned with a fanning mill, spread them out on a clean floor or canvas, or in a tight wagon box. While shoveling them over sprinkle them, until thoroughly moistened, with the following solution, which may be mixed in a

barrel and applied with a sprinkling can: one pound (about one pint) of formalin (40 per cent. formaldehyde, procurable at drug stores) thoroughly mixed with 50 gallons of water. Continue to shovel the oats until all kernels are evenly moist, then cover the pile with clean grain bags or canvas and leave covered at least two hours. The formaldehyde gas thus confined, and evenly distributed through the pile, kills the smut spores, but does not injure the oats. After the two hours, uncover and spread out the oats to dry, stirring occasionally with a garden rake, or otherwise. When sufficiently dry, the oats are ready to sow. If they are to be kept for some time before sowing, they should, of course, be more thoroughly dried to prevent heating. Ordinarily it is most convenient to treat the oats the afternoon or evening before they are to be sown. Then in the morning they are ready.

Each gallon of the made up solution is enough for a little more than a bushel of oats, that is one pound of formalin mixed with 50 gallons of water is enough for 50 or 60 bushels. The price of formalin (40 per cent. formaldehyde) varies from 25 to 40 cents per pound. It should be practically as clear as water.

After treating the seed oats, avoid contamination with smut spores from untreated oats, as in bags, bins, etc. Clean bags and bins should be used, or they may be cleaned by washing with boiling water or the formalin solution.

Two or three men can easily treat 50 bushels in less than half an hour, that is, to the point of covering the pile. The treatment should be generally practiced where there is any danger from oat smut. Try it.

For further particulars and illustrations, see Circular No. 22 of this Station.

A. G. Johnson,
Assistant Botanist

To the Editor:—Please credit both Station and Author with this bulletin.

Arthur Goss, Director

Indiana.

Purdue University Agricultural Experiment Station

ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 174, March 17, 1911

AGRICULTURAL EXTENSION

XVI

INDIANA EGGS ARE BAD

The farms of Indiana produced over 72,000,000 dozen eggs, valued at over $12,000,000, in 1910. A large proportion of these eggs were not first-class in quality, many of them being small, dirty, washed, cracked, stale or rotten. The following figures, taken from Circular No. 140 of the U. S. Department of Agriculture, are given to show the per cent. of undesirable eggs that are sold upon the market in the middle western states.

Preventable Loss in Marketable Eggs

Dirties	2	per cent.
Broken	2	per cent.
Chick development	5	per cent.
Shrunken or held	5	per cent.
Rotten	2½	per cent.
Mouldy	½	per cent.
Total	17	per cent.

Observation of conditions in Indiana has not shown that the eggs of this state are any better than any other state; in fact, some reports seem to indicate that the reverse is true. Assuming that the above figures are applicable to Indiana, it is fair to state that the annual loss to farmers selling good eggs amounts to over $2,210,000. This amount might therefore be saved to the producer without extra cost to the consumer, if buyers would buy eggs on their merits.

How Eggs Are Sold

Eggs with few exceptions are sold at so much per dozen, regardless of quality. This method of selling is called "Case Count." When the large buyers quote a price to a huckster, grocer or farmer they take into consideration the fact that during certain seasons of the year, there will be a certain proportion of undesirable eggs, that can bring them no profit and result only in a loss.

To meet this loss, the buyer must quote a price, lower than he could pay, if he knew all the eggs would be good. Therefore, the farmer producing and selling only strictly first-class eggs, pays for the loss due to the bad ones. For example, at a certain season of the year, the eggs will run 15 per cent. rotten. To meet this loss the buyer must quote a price 15 per cent. lower than he could have given if the eggs had all been first-class. Every farmer does not sell poor eggs. Many sell a fresh product and help to lessen the total percentage of the undesirable eggs. If every producer sold some bad eggs the price would be lower. Therefore, the man who sells the strictly fresh eggs pays for the loss on account of the bad ones.

No Incentive to Sell Fresh Eggs

With the present system of buying eggs there is no incentive to the producer to market first-class eggs, since the price is no greater for them than it is for poorer ones. Many times the question is asked by the man who always markets fresh eggs, "Why is it that I receive no more for my fresh eggs than some of my neighbors, who are not as particular as

to the quality of the eggs marketed?" As a matter of fairness, he should not be compelled to take the same price as his neighbor who sells bad eggs, in order that he may protect the buyer who will not buy on the basis of quality. Many buyers feel that they could afford to pay an increase of two cents per dozen over the regular quotations; in fact, one buyer once offered as high as five cents over local city quotations.

If a farmer kept 150 hens, which produced an average of only 100 eggs per year, the increase of two cents per dozen would mean an added profit of $25.00 per year. This increased profit is well worth the additional effort that would be necessary to obtain it.

Purdue Experiment Station is collecting data upon this subject and endeavoring through education to overcome this immense annual loss and to interest the farmers in demanding better prices for their good eggs, without increased cost to the consumer.

A. G. PHILLIPS,
Associate in Poultry Husbandry

To the Editor:—Please credit both Station and Author with this bulletin.
Arthur Goss, Director

Indiana.

Purdue University Agricultural Experiment Station

ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 175, March 31, 1911

AGRICULTURAL EXTENSION

XVII

HOW TO DETECT BAD EGGS

Not long ago it was stated that the eggs in Indiana were not bought according to quality, but at a flat rate of so much per dozen. However, when these eggs are received by the buyer, he is compelled to go over them and select the best eggs for his best trade.

Candling Eggs

The method used for this selection of eggs is called "Candling" or "Testing." The "egg candle" or "tester" is made of wood or metal and, as a rule, is kept in a dark room. A light, inside the tester shines through an opening, in front of which an egg is held by the candler. By a quick movement of the hand, the condition of the contents of the egg is quickly noted and the egg is placed in its proper class. A good candler works rapidly and will test a large number of eggs in a day.

Grading Eggs

Eggs are sometimes graded as follows:

Extras. Weight 28 to 26 ounces, naturally and absolutely clean, fresh and sound, same color. (a grade seldom used).

Firsts. Weight 26 to 24 ounces, sound, fresh and reasonably clean.

Seconds. Shrunken, stale, washed, stained, and dirty.

Checks. Cracked, not leaking.

Rots. Incubator, blood rings, dead germs, and decomposed eggs.

All eggs should be bought and sold on this grading system so that an egg will bring what it is worth.

Description of Egg Contents

When the candler tests the eggs he bases his judgment on the following indications:

Fresh. Opaque, appearing almost entirely free of any contents, sometimes dim outline of yolk visible, air cell very small.

Stale. Outline of yolk plainly visible, sometimes muddy in appearance, air cell very large.

Developed Germ. Dark spot visible, from which radiate light colored blood vessels.

Dead Germ. Dark spot attached to shell, or red ring of blood, visible.

Rotten. Muddy or very dark in appearance, yolk and white mixed, air cell large and sometimes movable.

Cracked. White lines showing irregularly in shell.

Testing as above suggested will aid one in determining absolutely, the quality of the eggs, not only for marketing, but for incubation. The farmer should demand that his eggs be bought upon the test. The buyer should co-operate with farmers and meet such demands by buying "loss off."

Recent changes in the Pure Food law make it unlawful to sell or offer for sale. eggs which are putrid, decomposed, rotten or unfit for food. The only way to obey this law is to sell eggs upon the grade.

A. G. PHILIPS,

Associate in Poultry Husbandry

To the Editor:—Please credit both Station and Author with this bulletin.

Arthur Goss, Director

Purdue University Agricultural Experiment Station
ARTHUR GOSS, DIRECTOR

Newspaper Bulletin No. 176, April 14, 1911
AGRICULTURAL EXTENSION
XVIII

HOW TO PRODUCE GOOD MARKET EGGS

There is a growing sentiment among some farmers and egg buyers of Indiana for the production of better eggs for the market. The buyers demand better eggs than they have been receiving and some farmers desire a better price for their good eggs. To produce these better eggs the farmer should have a thorough knowledge of conditions that may affect production. The egg is manufactured by the hen from the food that is consumed, hence her feeding should be carefully considered. No ration should be made up wholly of grain, but it should contain with the grain, a mixture of bran, shorts and beef scraps or skim milk. The grain should be fed in a deep litter to induce exercise. Green food of some kind, grit and oyster shell should always be handy for the fowls. The number of eggs produced will depend largely upon the breed used, the ration fed, the congeniality of surroundings and the care given. If any of these things mentioned be omitted, the number of eggs produced will be decreased. A male bird is not necessary for the production of eggs, hence should be removed from the flock at the end of each breeding season, in order to insure infertile eggs. Infertile eggs keep better and are very desirable upon the market.

Select Hens That Lay Large Eggs

Farmers should look well to their flocks when considering the question of egg production, and select large hens of the breed which they keep, culling out and disposing of all undersized birds. By this means they will be able to obtain eggs of desirable size.

What the Market Demands

All people do not agree on the definition of a good egg and even some, do not realize the conditions that sometimes affect its quality. In order to meet any demand for first-class eggs, the eggs should weigh one and one-half pounds to the dozen, be uniform in size, naturally clean, not washed, strong shelled and *fresh*.

A fresh egg is one that was laid by a healthy hen, is only a few days old and has been kept in desirable surroundings. A fresh egg is not one that was allowed to stay in the nest for a day or two, until it became convenient to gather it, or was taken

from a stolen nest, or an incubator, or from under a setting hen.

Conditions That Affect Eggs

Age causes an egg to become stale and shrunken and it can never be classed as a fresh egg. Heat seriously affects the quality of eggs and in warm weather they should be gathered daily and marketed as often as possible. Moisture causes molds to develop and quickly changes the quality of the egg. Muddy weather means dirty nests, consequently dirty eggs. Nests built upon the walls of barns and hen houses are often used as roosting places, causing filth to accumulate, resulting in dirty eggs. Dirty eggs must be handled as second grades; washed eggs are just as bad. Eggs deteriorate in quality if they are left behind the kitchen stove or are stored in damp or musty cellars.

When to Market Eggs

It is not desirable to keep eggs any length of time before marketing, although it sometimes becomes necessary to do so. When it becomes necessary to keep eggs, a cool, dry cellar should be used and the eggs kept in some receptacle, such as an egg case, that will prevent them becoming broken or stained. Such eggs should be marketed as soon as is possible. Only eggs that are properly handled can be accepted by egg buyers as first-class stock.

A. G. Philips,
Associate in Poultry Husbandry

To the Editor:—Please credit both Station and Author with this bulletin.

Arthur Goss, Director