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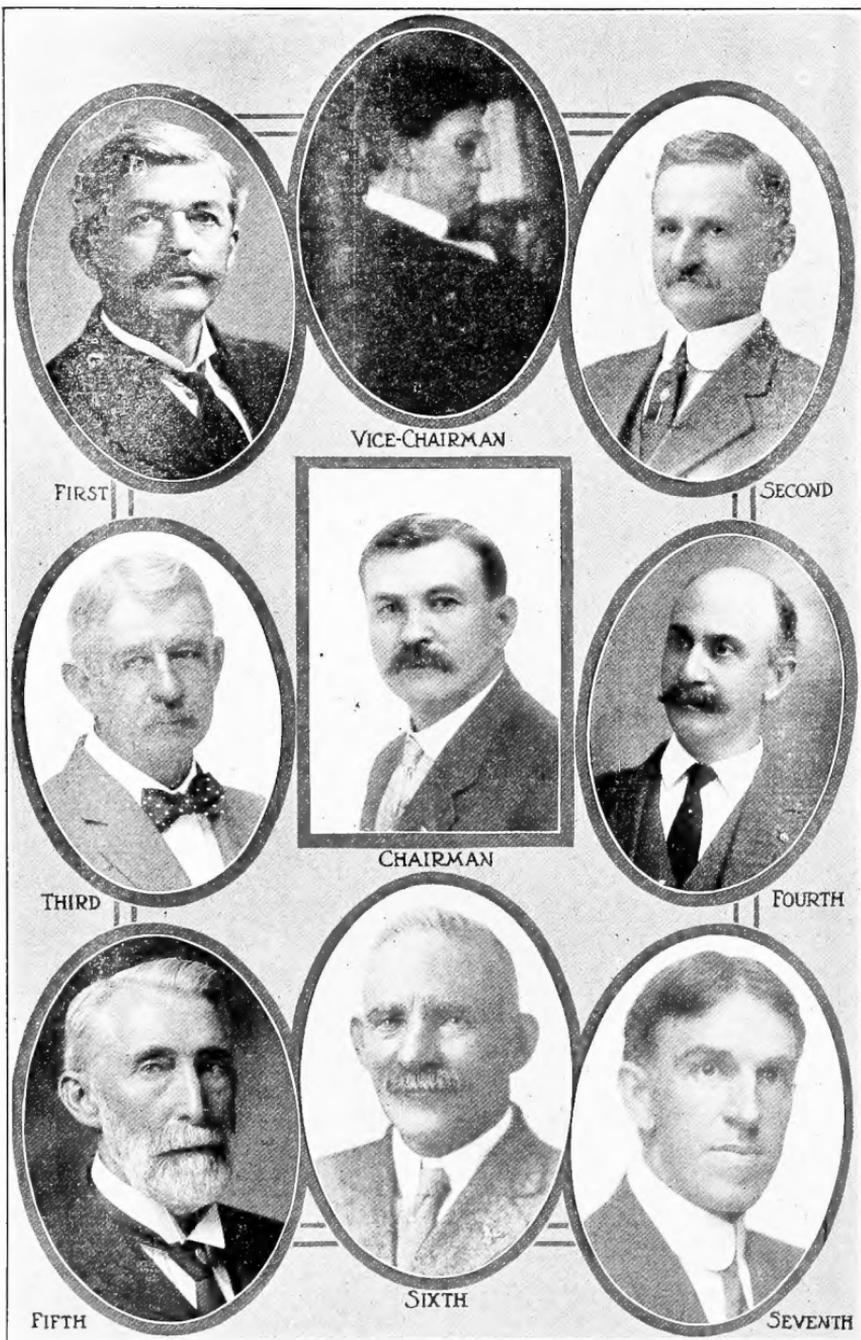
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Twenty-First Biennial Report

OF THE

Bureau of Agriculture,
Labor and Statistics

Of Kentucky
!!!

FOR

1914-1915

J. W. NEWMAN, Commissioner



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PART ONE.

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RESOURCES.

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LETTER OF TRANSMITTAL

LETTER OF TRANSMITTAL TO GENERAL ASSEMBLY.

Frankfort, Ky., January 1, 1916.

To the General Assembly of Kentucky:

We have the honor of submitting herewith the Twenty-first Biennial Report of the Department of Agriculture, Labor & Statistics, in compliance with the law creating this Department of the State Government.

It is impossible to give a detailed account of the various activities of this Department, and this report shows only a portion of the work really accomplished. The number of silos erected throughout the State; the increased number of fields of alfalfa and crimson clover; the numerous mills grinding agricultural limestone; the greater number of live stock; the great improvement in the fertility of the fields; larger crops; the activities in the Boys' Corn Club and Girls' Canning Club work; the continued growth of the Kentucky State Fair; the extended interest manifested in Farmers' Institutes; the improvement in methods of farming; the better live stock; better plowing and seeding; the increased number of agricultural organizations; the improvement in sanitary conditions on the farm; the better and larger community life of the people, bear testimony that this Department has not been idle.

The State Department of Agriculture does not claim credit for all the development in the State along the lines indicated above, but it has contributed its full share, and co-operated with all the many agencies working to develop the resources and citizenship of the Commonwealth.

More scientific and intelligent farming means more profitable farming; more profitable farming means more

money available for better roads, better schools, better churches and better homes. These are the things that make country life worth the living, and the more rural conditions are improved throughout the State, the fewer will be the people who leave the country for the city.

It must be remembered that the efforts of this Department are directed not only toward benefiting directly the seventy-five per cent. of Kentucky's population that is classed as rural, but also directly toward aiding an additional fifteen per cent. that toil in the factories, mines and workshops; and indirectly those whose livelihoods are obtained in a business or professional way from these creators of wealth.

It is our purpose to direct your attention to the fact that nothing like all of the people of the State are blessed with a common school education, and as the Department of Education can only directly assist the child, the children who are not in school, and those persons who are beyond the school age naturally look to the Department of Agriculture and Labor for assistance in learning how best to do things to increase their income, and to better their way of living in general. The Federal Congress has recognized the fact that the education of the schools, colleges and universities is insufficient in that so few have the means or opportunity to take advantage of the free instruction that is so liberally provided by the State and Federal authorities. It has, therefore, made enormous appropriations to carry information into the homes, where the father and mother are given the opportunity to increase their earning capacity, and to obtain more of the comforts of life through their own efforts.

Kentucky has never appreciated the fact that a great portion of her wealth is created upon the farm, and unless the State's per capita wealth increases in proportion to the State's financial necessities, an increased tax rate upon all is inevitable and unavoidable. This Department, with the small amount of funds at its command, has demonstrated beyond a doubt that thousands of dollars of additional wealth can be created upon the farms by the expenditure on the part of the State of a few

dollars in showing the farmers how to become more efficient.

Your attention is called to the fact that the head of this Department does not even have an assistant, when, in fact, no one man can properly look after any one of the three-fold interests with which this Department is charged. It is my desire to make plain to you that it is absolutely necessary for the State of Kentucky to make provision in keeping with that made by other States, for the development of its agricultural resources. It is equally as important that a Labor Bureau be created, capable of really handling and guarding the labor interests of the Commonwealth. About five thousand dollars of the money appropriated to this Department is expended in maintaining a Labor Bureau, and the remarkable results obtained through the expenditure of so little money are set forth in the Labor Report. Suffice it to say here that the state of New York expends approximately three-quarters of a million dollars for its Labor Bureau; Pennsylvania nearly one-half million dollars, while Kentucky expends little more than five thousand dollars. The wage earners of this State are entitled to more attention, and to better laws for their protection.

A considerable portion of this report is taken up with an account of the recent outbreak of foot-and-mouth disease in the State. Herein you will find the appraised value of all the live stock slaughtered in order to eradicate this fearful plague. Many of the states had emergency funds to meet such conditions, and the wonder is Kentucky, with practically no emergency funds, and no trained organization, succeeded in stamping out this enemy of animal life, and wrecker of private fortunes, so quickly, successfully and economically. Twenty-one states and one territory were similarly affected. My information is that all of them have made appropriations to cover one-half of the value of the animals destroyed, while the Federal Government has paid the other half. I feel sure that the General Assembly of Kentucky will see the wisdom of appropriating money to pay the claims in this State. I beg you to believe me when I say that not to pay them will leave my successor

in office absolutely unable to protect the live stock industry of Kentucky from this awful pestilence, which is likely to appear again at any time. Some provision should unquestionably be made for handling future outbreaks of this and other diseases of live stock. Had the various states been prepared financially, as well as organized professionally to combat this plague, millions of dollars would have been saved to the live stock owners within the last year when foot-and-mouth disease appeared for the sixth time in the United States. It is not an exaggeration to say that hundreds of millions worth of property were lost as a result of this unpreparedness on the part of the various states throughout the Union.

It is nothing short of folly to leave the State of Kentucky with its present lack of funds, lack of laws and lack of organization, the prey of a disease that would wipe out a substantial portion of the taxable wealth of the State within a few months, should it once obtain a widespread foothold in our borders. The live stock owners suffered great losses in portions of the State where the disease did not exist, due to the necessary quarantine orders on the part of the Federal and State authorities, and as a result of the panic conditions throughout the country, resulting from a knowledge that this disease was on American shores.

The live stock industry of this State has assumed great proportions and the larger it becomes the better for the State. Methods for transportation have been made easier, the live stock markets have been brought nearer, and the various live stock diseases are, therefore, more likely to enter the State. We have no adequate veterinary force, not more than one-half of the counties of the State having graduated veterinarians living within their borders. There is no law regulating the practice of veterinary surgery, and Kentucky has become a promising field for quack veterinarians from other states. The competent, capable veterinarians of the State deserve from the General Assembly consideration that will give them a law for protection in their practice.

The law presumes that the Assessor will aid this Department in collecting statistics. The method of gathering these statistics, as now practiced, is harmful, instead of helpful to the State's interest. False statistics are worse than no statistics at all, and some action should be taken that will either provide for the collection of reliable statistics on the part of the Assessor, or the questions should be left off the Assessor's blanks. We deem it unwise to publish as a part of the Biennial Report of this Department, the statistical report of the Board of Equalization, or its data on farm statistics. Its report is necessarily incomplete, due to the methods of collection, and to scatter it broadcast would do the State an injustice. The act providing for a Commissioner of Agriculture, Labor & Statistics, specifies the statistical information that shall be collected, and yet the funds are not sufficient to gather these statistics in one Congressional District.

The thinking farmers of Kentucky are rapidly reaching the conclusion that the increased production of farm crops is not the only thing the State Government should foster along agricultural lines, but the marketing of farm products is equally as important, and hence feel that the General Assembly should make some provision for a "marketing bureau" in this Department.

An expert accountant has examined our books each year, and copies of his statement showing where and for what the State's money appropriated for this Department has been expended, is on file in this office.

A study of the work of this Department should convince anyone that there should be laws enacted reorganizing the work so that the Commissioner and the State Board of Agriculture can render to the taxpayers of the State more efficient services along the lines indicated above, without any additional appropriation. With the authority given by the Legislature to do so, a part of the Department's funds can be used to meet the requirements of the Smith-Lever law, namely, that the State put up a given amount, and the Federal Government will duplicate it. By combining and co-operating with the Extension Department of the State University, the necessary additional funds may thus be secured for hold-

ing Farmers' Institutes, and part of the money now appropriated to the Department could be used for much needed work along other lines in this Department.

It is gratifying to realize that Kentucky is coming forward along agricultural lines, and I urge that the future Commissioner be given the opportunity to help the farming and laboring interests of the State in ways that I could not, owing to lack of the proper legislation.

J. W. NEWMAN.

RESOURCES BY COUNTIES.

FIGURES COMPILED FROM BOARD OF EQUALIZATION REPORT
OF 1915 POPULATION FROM UNITED STATES
CENSUS 1910.

ADAIR COUNTY.

Population 1900, 14,888; 1910, 16,503; per cent. increase 10.8. Assessed acreage of land 226,283 (United States census 256,000). Total assessed valuation taxable property \$2,694,985. Assessed value of land with improvements, \$1,670,158. Average assessed value of land per acre \$7.38 (United States census \$10.31). No railroads in the county; located in the south central portion of the State; formed in 1801; named for General John Adair; land rolling, and well timbered; county seat, Columbia, population 1,022.

ALLEN COUNTY.

Population 1900, 14,657; 1910, 14,882; per cent increase 1.5. Assessed acreage of land 200,840 (United States census 252,160). Total assessed valuation taxable property \$2,887,530. Assessed value of land with improvements \$1,825,648. Average assessed value of land per acre \$9.09 (United States census \$12.13). Railroads in county, L. & N., mileage 9.83; located in south central portion of the State; formed in 1815; named for Col. John Allen; land rolling; timber mostly cut; is in the oil section; good grazing and fruit land; county seat, Scottsville, population 1,327.

ANDERSON COUNTY.

Population 1900, 10,051; 1910, 10,146; per cent. increase .9. Assessed acreage of land 129,184 (United States census 128,640). Total assessed valuation tax-

able property \$3,413,397. Assessed value of land with improvements \$1,973,922. Average assessed value of land per acre \$15.27 (United States census \$22.07). Railroad in county, Southern Ry. in Kentucky, mileage 20.902; located in the central portion of the State; formed in 1827, and named for Richard Clugh Anderson, Jr.; land underlaid with limestone; considerable rolling land; splendid grazing and tobacco land; county seat, Lawrenceburg, population 1,723.

BALLARD COUNTY.

Population 1900, 10,761; 1910, 12,690; per cent. increase 17.9. Assessed acreage of land 155,162 (United States census 161,280). Total assessed valuation taxable property \$3,651,832. Assessed value of land with improvements \$1,949,096. Average assessed value of land per acre \$12.56 (United States census \$31.40). Railroads in county, I. C. 27.4, M. & O. 4.0, total mileage 31.47; located in extreme western part of State; formed in 1842, and named for Captain Bland Ballard; land mostly level; black loamy soil; timber mostly cut; splendid garden section; county seat, Wickliffe, population 989.

BARREN COUNTY.

Population 1900, 23,197; 1910, 25,293; per cent. increase 9. Assessed acreage of land 284,543 (United States census 310,400). Total assessed valuation taxable property \$5,804,306. Assessed value of land with improvements \$3,152,355. Average assessed value of land per acre \$11.07 (United States census \$22.05). Railroads in county, L. & N. 8.42, Glasgow Railway Co. 10.50, Mammoth Cave R. R. 2.01, total mileage 20.93; located in south-central portion of State; formed in 1798, and named for a section of the State originally referred to as "The Barrens or Prairies," timber had mostly disappeared as a result of the Indians burning off the land in the area in order that the buffalo and deer might have good grazing land; rather level section; splendid limestone quarries; land adapted to stock raising and growing of tobacco, both Burley and Dark; county seat, Glasgow, population 2,316.

BATH COUNTY.

Population 1900, 14,734; 1910, 13,988; per cent. decrease 5.1. Assessed acreage of land 171,448 (United States census 172,800). Total assessed valuation taxable property \$5,099,113. Value of land with improvements \$3,012,222. Average assessed value of land per acre \$17.55 (United States census \$38.98). Railroads in county, C. & O., mileage 15.86; located in the middle-eastern portion of the State; formed in 1811, and derives its name from the great number of medicinal springs within its borders; is on the dividing line between the Blue Grass and the Knobs; western portion of the county is a part of the Blue Grass section, and the eastern portion a part of the Knob section; splendid grazing land; this county adapted to tobacco and fruit growing; county seat, Owingsville, population 942.

BELL COUNTY.

Population 1900, 15,701; 1910, 28,447; per cent. increase 81.12. Assessed acreage of land 122,615 (United States census 245,760). Total assessed valuation taxable property \$6,771,042. Assessed value of land with improvements \$3,173,516. Average assessed value of land per acre \$25.88 (United States census \$14.67). Railroads in county, L. & N. mileage 77.69, Cumberland R. R. 2.09, total mileage 79.78; located in extreme south-eastern portion of the State; formed in 1867, and named for Joshua F. Bell; mountainous land; well timbered, and rich in minerals; farming area limited; fruit and poultry are the principal farming industries in this county; county seat, Pineville, population 2,161; largest city, Middlesboro, population 7,305.

BOONE COUNTY.

Population 1900, 11,170; 1910, 9,420; per cent. decrease 15.7. Assessed acreage of land 153,370 (United States census 160,640). Total assessed valuation taxable property \$7,165,285. Assessed value of land with improvements \$4,657,950. Average assessed value of land per acre \$30.37 (United States census \$36.91).

Railroads in county, C., N. O. & T. P. 9.13, L. & N. 9.46, total mileage 18.59; located in the north-central section of the State; formed in 1798, and named for Daniel Boone; land rolling; splendid grazing land; this county suited to fruit and tobacco growing; county seat, Burlington, population 172.

BOURBON COUNTY.

Population 1900, 18,069; 1910, 17,462; per cent. decrease 3.4. Assessed acreage of land 183,832 (United States census 194,560). Total assessed valuation taxable property \$16,739,035. Assessed value of land with improvements \$11,085,090. Average assessed value of land per acre \$60.30 (United States census \$88.94). Railroads in county, F. & C. 9.20, Kentucky Traction & Terminal Co. 8.44, L. & N. 36.63, total mileage 54.27; located in the central section of the State; formed in 1785, and named for the Bourbons of France; land gently rolling; practically no timber; some of the best blue grass lands in the State are found in this county; noted for its fine stock and Burley tobacco; county seat, Paris, population 5,859.

BOYD COUNTY.

Population 1900, 18,834; 1910, 23,444; per cent. increase 24.5. Assessed acreage of land 88,934 (United States census 101,760). Total assessed valuation taxable property \$10,166,766. Assessed value of land with improvements \$1,720,028. Average assessed value of land per acre \$19.34 (United States census \$17.80). Railroads, Ashland Coal and Iron Ry. 13.69, C. & O. R. R. 27.03, Ohio Valley Electric Ry. 2.73, total mileage 43.45; located in the extreme northeastern portion of the State; formed in 1860, and named for Honorable Lynn Boyd; the Big Sandy flows into the Ohio at Catlettsburg in this county; considerable bottom lands; hills low and rolling; splendid stock and fruit county; some timber left; county seat, Catlettsburg, population 3,550; largest city, Ashland, population 8,688; the latter one of the best manufacturing cities in the State.

BOYLE COUNTY.

Population 1900, 13,817; 1910, 14,668; per cent. increase 6.2. Assessed acreage of land 109,065 (United States census 119,040). Total assessed valuation taxable property \$9,687,236. Assessed value of land with improvements \$4,320,611. Average assessed value of land per acre \$39.61 (United States census \$55.83). Railroads in county, C., N. O. & T. P. 10.42, L. & N. R. R. 15.36, Southern Ry. in Kentucky 2.00, total mileage 27.78; located in central portion of the State, south of the Kentucky River; formed in 1842, and named for ex-Chief Justice John Boyle; one of the best Blue Grass counties; small in area; practically no timber; great live stock and tobacco county; county seat, Danville, population 5,420; famous Central University located at Danville.

BRACKEN COUNTY.

Population 1900, 12,137; 1910, 10,308; per cent. decrease 15.1. Assessed acreage of land 123,855 (United States census 130,560). Total assessed valuation taxable property \$3,825,227. Assessed value of land with improvements \$2,278,339. Average assessed value of land per acre \$18.39 (United States census \$32.25). Railroads in county, C. & O. 19.29, Brooksville R. R. 10.00, total mileage 29.29; located in the northeastern section of the State; formed in 1796, and named for William Bracken; land rolling, timber mostly cut; stock raising and Burley tobacco growing principal industries; splendid fruit county; county seat, Brooksville, population 492; largest city, Augusta, population 1,787.

BREATHITT COUNTY.

Population 1900, 14,322; 1910, 17,540; per cent. increase 22.5. Assessed acreage of land 346,908 (United States census 309,120). Total assessed valuation taxable property \$3,041,057. Assessed value of land with improvements \$1,952,619. Average assessed value of land per acre \$5.62 (United States census \$7.93). Railroads, L. & N. 36.77, Ohio & Kentucky R. R. 13.82, total mileage 50.59; located in the eastern section of the State; formed in 1839, and named for Governor John

Breathitt; lands mountainous, and well timbered; farming area limited; this county is adapted to fruit and live stock growing; rich in coal and ore deposits; county seat, Jackson, population 1,346.

BRECKINRIDGE COUNTY.

Population 1900, 20,534; 1910, 21,034; per cent. increase 2.4. Assessed acreage of land 327,681 (United States census 363,520). Total assessed valuation taxable property \$4,854,702. Assessed value of land with improvements \$2,688,877. Average assessed value of land per acre \$8.20 (United States census \$8.29). Railroads, L. H. & St. L., mileage 67.30; located in the west-central portion of the State; formed in 1799, and named for John Breckinridge; this is in the "Pennyroyal" section; land rolling; timber mostly cut; splendid stock, fruit and tobacco county; county seat Hardinsburg, population 737.

BULLITT COUNTY.

Population 1900, 9,602; 1910, 9,487; per cent. decrease 1.2. Assessed acreage of land 169,177 (United States census 197,120). Total assessed valuation taxable property \$3,209,634. Assessed value of land with improvements \$1,967,601. Average assessed value of land per acre \$11.63 (United States census \$13.66). Railroads, L. H. & St. L. 4.50, L. & N. 29.69, total mileage 34.19; located in the west central portion of the State; formed in 1796, and named for Lieutenant Governor Alexander Scott Bullitt; lands level to hilly; timber mostly cut; adapted to live stock, fruit and vegetable growing; close to the Louisville market; splendid dairying opportunities; county seat Shepherdsville, population 318.

BUTLER COUNTY.

Population 1900, 15,896; 1910, 15,805; per cent. decrease .6. Assessed acreage of land 226,828 (United States census 266,880). Total assessed valuation taxable property \$2,878,094. Assessed value of land with improvements \$1,704,896. Average assessed value of

land per acre \$7.51 (United States census \$7.26). No railroads in county; located in the western south-central portion of the State; formed in 1810, and named for General Butler, of Revolutionary fame; lands hilly; timber mostly cut; some splendid bottom lands along Barren River; county seat, Morgantown, population 569.

CALDWELL COUNTY.

Population 1900, 14,510; 1910, 14,063; per cent. decrease 3.1. Assessed acreage of land 210,917 (United States census 206,080). Total assessed valuation taxable property \$3,517,924. Assessed value of land with improvements \$1,830,706. Average assessed value of land per acre \$6.68 (United States census \$11.39). Railroads, I. C. 46.31; located in the western portion of the State; formed in 1809, and named for General John Caldwell; lands uneven; much limestone found in the county; timber mostly cut; land adapted to live stock raising, fruit and vegetable growing, and the growing of dark tobacco; county seat, Princeton, population 3,015.

CALLOWAY COUNTY.

Population 1900, 15,633; 1910, 19,867; per cent. increase 12.7. Assessed acreage of land 344,414 (United States census 263,680). Total assessed valuation taxable property \$5,323,333. Assessed value of land with improvements \$3,303,949. Average assessed value of land per acre \$9.59 (United States census \$14.64). Railroads, N. C. & St. L. 17.97; located in the southwest portion of the State; formed in 1822, and named for Colonel Richard Calloway; land rather level; adapted to live stock, fruit and vegetable growing; large amount of dark tobacco produced; timber mostly cut; county seat, Murray, population 2,089.

CAMPBELL COUNTY.

Population 1900, 54,223; 1910, 59,369; per cent. increase 9.5. Assessed acreage of land 89,742 (United States census 92,800). Total assessed valuation taxable property \$25,630,654. Assessed value of land with

improvements \$3,710,970. Average assessed value of land per acre \$41.35 (United States census \$38.56). Railroads, C. & O. 26.05, L. & N. 3.87, total mileage 29.92; located in the north-central portion of the State; formed in 1794, and named for Colonel John Campbell; lands hilly; practically no timber; some rich, fertile bottom lands; splendid dairy products; land adapted to fruit, vegetables and live stock; county seat, Alexandria, population 353; largest city, Newport, population 30,309.

CARLISLE COUNTY.

Population 1900, 10,195; 1910, 9,048; per cent. decrease 11.3. Assessed acreage of land 106,597 (United States census 126,720). Total assessed valuation taxable property \$2,898,992. Assessed value of land with improvements \$1,607,000. Average assessed value of land per acre \$15.07 (United States census \$30.18). Railroads, I. C. 12.27, Mobile & Ohio 10.576, total mileage 22.846; located in the extreme western portion of the State; formed in 1886, and named for Hon. John G. Carlisle; land mostly level, and well cut over; adapted to live stock, fruit and vegetable production; market opportunities for vegetables splendid; county seat, Bardwell, population 587.

CARROLL COUNTY.

Population 1900, 9,825; 1910, 8,110; per cent. decrease 17.5. Assessed acreage of land 80,826 (United States census 84,480). Total assessed valuation taxable property \$3,312,149. Assessed value of land with improvements \$1,609,687. Average assessed value of land per acre \$19.91 (United States census \$30.99). Railroads, Carrollton & Worthville 9.98, L. & N. 17.09, total mileage 27.07; located on the Ohio River in the central section of the northern part of the State; formed in 1838, and named for Charless Carroll, of Carrollton; many rich first and second bottom lands in this county; other portions hilly; but little timber; splendid live stock and tobacco county; county seat, Carrollton, population 1,906; the Kentucky River flows into the Ohio at Carrollton.

CARTER COUNTY.

Population 1900, 20,228; 1910, 21,966; per cent. increase 8.6. Assessed acreage of land 236,334 (United States census 264,320). Total assessed valuation taxable property \$2,825,627. Assessed value of land with improvements \$1,508,321. Average assessed value of land per acre \$6.38 (United States census \$8.35). Railroads, Ashland Coal & Iron Ry. 8.37, C. & O. 32.84, Eastern Kentucky Ry. 17.59, total mileage 58.80; located in the eastern portion of the State; formed in 1838, and named for Colonel William G. Carter; land hilly to mountainous; some timber and minerals found; fire clay is produced in great quantities; county seat, Grayson, population 735; largest city, Olive Hill, population 1,132.

CASEY COUNTY,

Population 1900, 15,144; 1910, 15,479; per cent. increase 2.2. Assessed acreage of land 245,774 (United States census 242,560). Total assessed valuation taxable property \$2,513,142. Assessed value of land with improvements \$1,796,224. Average assessed value of land per acre \$7.30 (United States census \$9.34). No railroads in county; located in the south-central portion of the State; formed in 1806, and named for Colonel William Casey; lands rather hilly, and well cut over; splendid grazing lands; well adapted to fruits; county seat, Liberty, population 330.

CHRISTIAN COUNTY.

Population 1900, 37,982; 1910, 38,845; per cent. increase 2.3. Assessed acreage of land 434,426 (United States census 464,000). Total assessed valuation taxable property \$12,774,665. Assessed value of land with improvements \$6,512,435. Average assessed value of land per acre \$10.38 (United States census \$20.65). Railroads, Cadiz R. R. .33, I. C. 10.44, L. & N. 32.31, Tennessee Central R. R. 16.10, total mileage 82.35; located in the southwestern portion of the State; formed in 1796, and named for Colonel William Christian; southern por-

tion of the county level and very fertile, northern portion hilly and poor land; live stock, grain and tobacco produced in large quantities; splendid farming county; county seat, Hopkinsville, population 9,419.

CLARK COUNTY.

Population 1900, 16,694; 1910, 17,987; per cent. increase 7.7. Assessed acreage of land 156,921 (United States census 169,600). Total assessed valuation taxable property \$12,966,257. Assessed value of land with improvements \$6,739,900. Average assessed value of land per acre \$42.95 (United States census \$69.40). Railroads, C. & O. 18.58, Kentucky Traction & Terminal Company 1.14, L. & N. R. R. 38.02, total mileage 57.74; located in the central portion of the State; formed in 1792, and named for General George Rogers Clark; one of the best Blue Grass counties; land rolling; practically no timber; stock, grain and tobacco production large; county seat, Winchester, population 7,156.

CLAY COUNTY.

Population 1900, 15,364; 1910, 17,789; per cent. increase 15.8. Assessed acreage of land 276,158 (United States census 305,920). Total assessed valuation taxable property \$2,666,943. Assessed value of land with improvements \$1,788,319. Average assessed value of land per acre \$6.47 (United States census \$7.53). No railroads in county; located in the eastern portion of the State; formed in 1806, and named for General Green Clay; land classed as mountainous; well timbered; rich in minerals; farming area limited; fruit and live stock growing can be carried on here; county seat, Manchester, population 626.

CLINTON COUNTY.

Population 1900, 7,871; 1910, 8,153; per cent. increase 3.6. Assessed acreage of land 118,098 (United States census 149,120). Total assessed valuation taxable property \$1,501,312. Assessed value of land with improvements \$902,974. Average assessed value of land per acre \$7.64 (United States census \$9.39).

No railroads in county; located along the Tennessee line in the south-central portion of the State; formed in 1835, and named for General DeWitt Clinton, of New York; land hilly; a live stock and fruit county; some timber left; coal is known to exist; county seat, Albany, population 579.

CRITTENDEN COUNTY.

Population 1900, 15,191; 1910, 13,296; per cent decrease 12.5. Assessed acreage of land 219,459 (United States census 250,240). Total assessed valuation taxable property \$3,570,988. Assessed value of land with improvements \$1,897,950. Average assessed value of land per acre \$8.64 (United States census \$9.76). Railroads, I. C., mileage 22.50; located in the western portion of the State; formed in 1842, and named for John J. Crittenden; land hilly; but little timber left; noted for its production of fluorspar; other minerals exist; land adapted to stock raising; tobacco and grain crops do well; county seat, Marion, population 1,627.

CUMBERLAND COUNTY.

Population 1900, 8,962; 1910, 9,846; per cent, increase 9.9. Assessed acreage of land 158,247 (United States census 247,680). Total assessed valuation taxable property \$1,943,796. Assessed value of land with improvements \$1,384,811. Average assessed value of land per acre \$8.75 (United States census \$9.95). No railroads in county; located in the extreme southern portion of the State; formed in 1798, and named for Cumberland River; lands generally hilly; rich fertile bottoms; the lands are adapted to the production of live stock, corn, wheat and tobacco; some timber left; county seat, Burkesville, population 817.

DAVIESS COUNTY.

Population 1900, 38,667; 1910, 41,020; per cent. increase 6.1. Assessed acreage of land 273,006 (United States census 305,920). Total assessed valuation taxable property \$17,020,405. Assessed value of land with improvements \$6,701,403. Average assessed value of

land per acre \$24.54 (United States census \$41.44). Railroads, I. C. 18.99, L. & N. R. R. 14.45, L. H. & St. L. Ry. 26.30, total mileage 59.74; located on the Ohio River, in the western portion of the State; formed in 1815, and named for Joseph Hamilton Daviess; land is generally level, but has some hilly portions; but little timber left; corn is grown in first bottom lands; wheat and grain in second bottom lands, while the hilly lands produce live stock, tobacco, wheat, etc.; county seat, Owensboro, population 16,011.

EDMONSON COUNTY.

Population 1900, 10,080; 1910, 10,469; per cent. increase 3.9. Assessed acreage of land 173,975 (United States census 197,120). Total assessed valuation taxable property \$2,263,473. Assessed value of land with improvements \$1,585,323. Average assessed value of land per acre \$9.11 (United States census \$7.35). Railroads, L. & N. 4.39, Mammoth Cave R. R. 6.74, total mileage 11.13. Located in the south-central portion of State; formed in 1825, and named for Captain John Edmonson; lands hilly; some timber left; adapted to live stock and fruit production; in this county is the famous Mammoth Cave; county seat, Brownsville, population 313.

ELLIOTT COUNTY.

Population 1900, 10,387; 1910, 9,814; per cent. decrease 5.5. Assessed acreage of land 131,930 (United States census 168,320). Total assessed valuation taxable property \$1,086,880. Assessed value of land with improvements \$701,187. Average assessed value of land per acre \$5.31 (United States census \$5.66). No railroads in county; located in the eastern portion of State; formed in 1869, and named for Judge John M. Elliott; a mountainous county; well timbered; mineral wealth of the county considerable; large deposits of coal are found; county seat, Sandy Hook, population 300.

ESTILL COUNTY.

Population 1900, 11,669; 1910, 12,273; per cent. increase 5.2. Assessed acreage of land 142,428 (United States census 162,560). Total assessed valuation taxable property \$1,777,109. Assessed value of land with improvements \$956,708. Average assessed value of land per acre \$6.72 (United States census \$10.81). Railroads, L. & N., 18.99. Located in eastern portion of State; formed in 1808, and named for Captain James Estill; lands hilly; some timber left; lands well adapted to fruit and live stock production; county seat, Irvine, population 282.

FAYETTE COUNTY.

Population 1900, 42,071; 1910, 47,715; per cent. increase 13.4. Assessed acreage of land 174,482 (United States census 172,160). Total assessed valuation taxable property \$41,002,316. Assessed value of land with improvements \$15,393,680. Average assessed value of land per acre \$88.23 (United States census \$106.98). Railroads, C. & O. 14.26, C., N. O. & T. P. Ry. 13.88, Kentucky Traction & Terminal Company 43.97, L. & N. 30.49, Southern Ry. in Kentucky 8.206, total mileage 110.806; located in the central portion of the State; formed in 1780, and named for Marquis LaFayette; is in the center of the Blue Grass region; land level to rolling; practically no timber; one of the best agricultural counties in the State; noted for its fine live stock production; for its grain and Burley tobacco yields; the whole county underlaid with limestone formation; some of the finest live stock farms in the world are in this county; county seat, Lexington, population 35,099. At Lexington are located the Kentucky State University, the Kentucky Agricultural Experiment Station, Transylvania University, Hamilton College, Sayre Institute, and St. Catherine's Academy. Lexington is the largest loose-leaf tobacco warehouse market in the world, and prides itself on being the "Hub" of the Blue Grass region.

FLEMING COUNTY.

Population 1900, 17,074; 1910, 16,066; per cent. decrease 5.9. Assessed acreage of land 212,676 (United States census 208,000). Total assessed valuation taxable property \$6,307,793. Assessed value of land with improvements \$4,123,024. Average assessed value of land per acre \$19.38 (United States census \$32.75). Railroads, L. & N. 8.92, Cincinnati, Flemingsburg & Southeastern 5.60, total mileage 14.52; located at the edge of the Blue Grass region, in the northwestern portion of the State; formed in 1798, and named for Colonel John Fleming; the western portion of the county is fine blue grass land, while the other portions are more or less hilly; little timber left; is a splendid stock and tobacco county; county seat, Flemingsburg, population 1,219.

FLOYD COUNTY.

Population 1900, 15,552; 1910, 18,623; per cent. increase 19.7. Assessed acreage of land 404,371 (United States census 255,360). Total assessed valuation taxable property \$3,740,048. Assessed value of land with improvements \$2,501,992. Average assessed value of land per acre \$6.18 (United States census \$11.01). Railroads, C. & O. 49.39; located in the extreme eastern portion of the State; formed in 1799, and named for Colonel John Floyd; a mountain county; well supplied with timber and minerals; farming area limited; splendid near-by market at the coal mines for all poultry products, fruits and vegetables grown; county seat, Prestonsburg, population 1,120.

FRANKLIN COUNTY.

Population 1900, 20,852; 1910, 21,135; per cent. increase 1.4. Assessed acreage of land 127,441 (United States census 127,360). Total assessed valuation taxable property \$9,081,057. Assessed value of land with improvements \$3,276,561. Average assessed value of land per acre \$25.71 (United States census \$33.10). Railroads, F. & C. 10.02, Kentucky Traction & Terminal Co. 12.73, Kentucky Highland Ry. 4.21, L. & N. 15.57, total mileage 42.53; located in the central portion of the

State; formed in 1794, and named for Benjamin Franklin; a portion of the Blue Grass region; a part of the county very level and productive, while other parts are more or less hilly; a good farming county; little timber left; no minerals found; county seat and State Capital, Frankfort, population 10,465. Frankfort is a beautiful and prosperous little city, nestled between the hills along the Kentucky River, and is particularly proud of the new State Capitol building and the Governor's Mansion recently completed; on the hill overlooking the city and the Kentucky River is the beautifully-kept cemetery, in which are buried more of Kentucky's illustrious dead than any other cemetery in the State.

FULTON COUNTY.

Population 1900, 11,546; 1910, 14,114; per cent. increase 22.2. Assessed acreage of land 115,086 (United States census 123,520). Total assessed valuation taxable property \$5,389,748. Assessed value of land with improvements \$2,466,765. Average assessed value of land per acre \$21.43 (United States census \$43.66). Railroads, I. C. 19.71, Mobile & Ohio 6.635, N. C. & St. L. 10.52, total mileage 36.865; located in the extreme western part of the State on the Mississippi River; formed in 1845, and named for Robert Fulton; lands rolling, with little timber left; a level area with a rich loamy soil; particularly adapted to gardening and raising tobacco; county seat, Hickman, population 2,736.

GALLATIN COUNTY.

Population 1900, 5,163; 1910, 4,697; per cent. decrease 9. Assessed acreage of land 59,823 (United States census 69,760). Total assessed valuation taxable property \$1,421,289. Assessed value of land with improvements \$890,031. Average assessed value of land per acre \$14.87 (United States census \$26.50). Railroads, L. & N. 11.51; located on the Ohio River and a part of the north-central section of the State; formed in 1798, and named for Albert Gallatin; the land area

is rather rough, but fertile; good dairy opportunities, with possibilities for market gardening good, as this county lies about midway between Louisville and Cincinnati; county seat, Warsaw, population 900.

GARRARD COUNTY.

Population 1900, 12,042; 1910, 11,894; per cent. decrease 1.2. Assessed acreage of land 140,845 (United States census 151,680). Total assessed valuation taxable property \$6,895,320. Assessed value of land with improvements \$4,613,070. Average assessed value of land per acre \$32.75 (United States census \$50.84). Railroads, L. & N. 14.20; located in the central portion of the State, and in the Blue Grass region, being one of the last counties south in this famous section; formed in 1796, and named for Governor James Garrard; land rolling; little timber left; live stock and tobacco predominate; splendid grazing land; county seat, Lancaster, population 1,507.

GRANT COUNTY.

Population 1900, 13,239; 1910, 10,581; per cent. decrease 20.1. Assessed acreage of land 158,295 (United States census 168,960). Total assessed valuation taxable property \$3,885,876. Assessed value of land with improvements \$2,405,045. Average assessed value of land per acre \$15.19 (United States census \$25.71). Railroads, C., N. O. & T. P. 22.45, L. & N. 7.32, total mileage 29.77; located in the north-central portion of State; formed in 1820; supposed to be named for Colonel John Grant, but possibly for his brother, Samuel Grant, who was an influential citizen of the county at the time of its formation; land hilly; underlying is a formation of limestone; the fine blue grass with which these hills are covered make it a great grazing county; it is also a good Burley tobacco county; county seat, Williams-town, population 800.

GRAVES COUNTY.

Population 1900, 33,204; 1910, 33,539; per cent. increase 1. Assessed acreage of land 341,704 (United States census 352,640). Total assessed valuation tax-

able property \$11,677,530. Assessed value of land with improvements \$6,220,700. Average assessed value of land per acre \$18.20 (United States census \$20.73). Railroads, I. C. 30.67, N. C. & St. L. .49, total mileage 31.16; located in the extreme western portion of the State; formed in 1824, and named for Major Benjamin Graves; mostly level land; a good dark tobacco county; no great amount of timber left; land adapted to the production of vegetables; markets convenient; county seat, Mayfield, population 5,916. .

GRAYSON COUNTY.

Population 1900, 19,878; 1910, 19,958; per cent. increase .4. Assessed acreage of land 294,490 (United States census 318,080). Total assessed valuation taxable property \$2,814,818. Assessed value of land with improvements \$1,570,029. Average assessed value of land per acre \$5.34 (United States census \$8.49). Railroads, I. C. 33.80; located west of the central portion of the State; formed in 1810, and named for Colonel William Grayson, of Virginia; land uneven to hilly; not much timber left; a great deal of attention paid to live stock and poultry; county seat, Leitchfield, population 1,053.

GREEN COUNTY.

Population 1900, 12,255; 1910, 11,871; per cent. decrease 3.1. Assessed acreage of land 154,266 (United States census 178,560). Total assessed valuation taxable property \$1,499,454. Assessed value of land with improvements \$958,723. Average assessed value of land per acre \$6.21 (United States census \$13.70). Railroads, L. & N. 6:14; located in the south-central portion of the State; formed in 1792, and named for General Nathaniel Green; land rolling; timber well cut; some rich river and creek bottom lands; uplands rather thin; county seat, Greensburg, population 450.

GREENUP COUNTY.

Population 1900, 15,432; 1910, 18,475; per cent. increase 19.7. Assessed acreage of land 798,048 (United States census 221,440). Total assessed valuation tax-

able property \$3,203,298. Assessed value of land with improvements \$1,539,175. Average assessed value of land per acre \$7.77 (United States census \$10.82). Railroads, C. & O. 31.19, Eastern Ky. Ry. 17.08, total mileage 48.27; located in the northeastern portion of the State; formed in 1803, and named for Governor Christopher Greenup; some timber left; river and creek bottoms fertile; hill lands are adapted to fruits, vegetables and live stock; county seat, Greenup, population 680.

HANCOCK COUNTY.

Population 1900, 8,914; 1910, 8,512; per cent. decrease 4.5. Assessed acreage of land 121,630 (United States census 123,520). Total assessed valuation taxable property \$2,197,703. Assessed value of land with improvements \$1,396,557. Average assessed value of land per acre \$11.48 (United States census \$14.16). Railroads, L. H. & St. L. 24.10; located in the northwestern portion of the State; formed in 1829, and named for John Hancock, president of the Continental Congress; this county is on the Ohio River, and has some rich bottom land as well as creek bottoms; the other lands are more or less hilly; timber well cut; county seat, Hawesville, population 1,002.

HARDIN COUNTY.

Population 1900, 22,937; 1910, 22,696; per cent. decrease 1.1. Assessed acreage of land 366,093 (United States census 387,840). Total assessed valuation taxable property \$6,157,749. Assessed value of land with improvements \$3,269,521. Average assessed value of land per acre \$8.11 (United States census \$14.92). Railroads, I. C. 48.51, L. H. & St. L. 2.70, L. & N. 28.50, total mileage 79.71; located in the west-central portion of the State, in the heart of the "Pennyroyal"; formed in 1792, and named for Colonel John Hardin; fine river and creek bottoms; uplands level to rolling; dairying interests of this county are large; grains of all kinds grown; splendid fruit county; a demonstration orchard of 1,500 acres was planted here in 1913 by the State De-

partment of Agriculture to emphasize the splendid fruit lands of this county; live stock raised in large numbers; timber mostly cut; county seat, Elizabethtown, population 1,970.

HARLAN COUNTY.

Population 1900, 9,836; 1910, 10,566; per cent. increase 7.4. Assessed acreage of land 161,308 (United States census 305,920). Total assessed valuation taxable property \$4,456,264. Assessed value of land with improvements \$2,943,232. Average assessed value of land per acre \$18.25 (United States census \$18.41). Railroads, L. & N. 48.27; located in the extreme southeastern portion of the State; formed in 1819, and named for Major Silas Harlan; mountainous land, much valuable timber left standing; coal and ore deposits in large quantities; county seat, Harlan, population 2,500.

HARRISON COUNTY.

Population 1900, 18,570; 1910, 16,873; per cent. decrease 9.1. Assessed acreage of land 188,656 (United States census 199,040). Total assessed valuation taxable property \$8,575,255. Assessed value of land with improvements \$5,538,472. Average assessed value of land per acre \$29.36 (United States census \$44.60). Railroads, C., N. O. & T. P. 2.43, L. & N. R. R. 21.32, total mileage 23.75; located in the central portion of the State; formed in 1793, and named for Colonel Benjamin Harrison; a blue grass county; timber mostly cut; produces large quantities of Burley tobacco, and a great deal of live stock; grains of all kinds do well in this county; county seat, Cynthiana, population 3,603.

HART COUNTY.

Population 1900, 18,390; 1910, 18,173; per cent. decrease 1.2. Assessed acreage of land 245,965 (United States census 275,200). Total assessed valuation taxable property \$3,735,869. Assessed value of land with improvements \$2,131,520. Average assessed value of land per acre \$8.67 (United States census \$18.99).

Railroads, L. & N. 22.27; located in the west-central portion of the State; formed in 1819, and named for Captain Nathaniel Hart; land mostly hilly; some splendid river and creek bottoms; second bottom lands produce large quantities of grain and tobacco; but little timber left; county seat, Munfordville, population 475; largest town, Horse Cave, population 881.

HENDERSON COUNTY.

Population 1900, 32,907; 1910, 29,352; per cent. decrease 10.8. Assessed acreage of land 270,053 (United States census 278,400). Total assessed valuation taxable property \$13,632,144. Assessed value of land with improvements \$6,016,490. Average assessed value of land per acre \$22.28 (United States census \$38.08). Railroads, I. C. 14, L. H. & St. L. 17, L. & N. 14.92, total mileage 45.92; located in the northern section of the western part of the State on the Ohio River; formed in 1798, and named for Colonel Richard Henderson; the Green River empties into the Ohio River on the border of the county; large area first and second bottom lands; not much timber left; large quantities of grain and dark tobacco produced; soil very fertile; is said to have the largest fruit interests of any county in the State; county seat, Henderson, population 11,452.

HENRY COUNTY.

Population 1900, 14,620; 1910, 13,716; per cent. decrease 6.2. Assessed acreage of land 178,638 (United States census 193,920). Total assessed valuation taxable property \$5,768,307. Assessed value of lands with improvements \$3,713,417. Average assessed value of land per acre \$20.79 (United States census \$37.09). Railroads, L & N. 29.67; located in the northern section of the middle division of the State; formed in 1798, and named for Patrick Henry; a blue grass county; not much timber; grain and Burley tobacco principal crops; a good live stock county; county seat, New Castle, population 468; largest city, Eminence, population 1,274.

HICKMAN COUNTY.

Population 1900, 11,745; 1910, 11,750; per cent. increase less than 1/10 of 1%. Assessed acreage of land 137,059 (United States census 144,000). Total assessed valuation taxable property \$4,451,060. Assessed value of land with improvements \$2,666,502. Average assessed value of land per acre \$19.43 (United States census \$31.04). Railroads, I. C. 17.16, Mobile & Ohio 17.052, St. Louis, Iron Mountain & Southern 1.18, total mileage 35.392; located in the extreme western portion of the State; formed in 1821, and named for Captain Paschal Hickman; land mostly level; little timber left; much overflow land in this county; soil fertile, and adapted to gardening; the principal cotton county in the State; the yield is said to be the highest per acre of any county in the United States, and of great value in the production of cotton seed; county seat, Hickman, population 1,497.

HOPKINS COUNTY.

Population 1900, 30,995; 1910, 34,291; per cent. increase 10.6. Assessed acreage of land 363,945 (United States census 349,440). Total assessed valuation taxable property \$7,080,550. Assessed value of land with improvements \$3,145,951. Average assessed value of land per acre \$8.64 (United States census \$20.28). Railroads, I. C. 22.26, L. & N. 77.20, total mileage 99.46; located west of the central portion of the State; formed in 1806, and named for General Samuel Hopkins; lands vary in texture; surface level to hilly; timber mostly cut; coal interests large; grain and dark tobacco produced; county seat, Madisonville, population 4,966.

JACKSON COUNTY.

Population 1900, 10,561; 1910, 10,743; per cent. increase 1.6. Assessed acreage of land 196,906 (United States census 213,120). Total assessed valuation taxable property \$1,827,230. Assessed value of land with improvements \$1,357,209. Average assessed value of land per acre \$6.89 (United States census \$5.08). Railroads (none in county); located east of the central section of the State; formed in 1858, and named for Gen-

eral Andrew Jackson, afterwards President of the United States; lands hilly to mountainous; and vary in texture; some timber left; coal deposits numerous; land adapted to live stock and fruit; county seat, McKee, population 146.

JEFFERSON COUNTY.

Population 1900, 232,549; 1910, 262,920; per cent. increase 13.1. Assessed acreage of land 185,127 (United States census 247,680). Total assessed valuation taxable property \$209,852,360. Assessed value of land with improvements \$17,165,040. Average assessed value of land per acre \$92.72 (United States census \$90.40). Railroads, B. & O. S. W. .92, C. I. & L. 1.12, I. C. 20.55, L. H. & St. L. 11.50, L. & N. 43.834, L. & I. 69.497, L. & S. Indiana Traction Co. .134, Penn. Terminal Ry. 9.72, Sou. Ry. in Kentucky 21.387, total mileage 182.212; located in the north middle section of the State, and on the Ohio River; formed in 1780, and named for Thomas Jefferson, afterwards President of the United States, and with Fayette and Lincoln counties originally comprised the whole of Kentucky, then a county of Virginia; lands mostly level; practically no timber; soil mostly adapted to gardening; large quantities of onion sets and potatoes produced in this county; county seat, Louisville, population 223,928. Louisville is by far the largest city in Kentucky; has a great many manufacturing establishments and business interests; is known as the "Gateway of the South"; the Kentucky State Fair is located here.

JESSAMINE COUNTY.

Population 1900, 11,925; 1910, 12,613; per cent. increase 5.8. Assessed acreage of land 104,513 (United States census 110,080). Total assessed valuation taxable property \$7,750,740. Assessed value of land with improvements \$5,340,290. Average assessed value of land per acre \$51.10 (United States census \$68.03). Railroads, C., N. O. & T. P. 15.94, Kentucky Traction & Terminal Co. 5.93, L. & N. 17.33, total mileage 39.20; located in the central portion of the State; formed in 1798,

and named for Jessamine Creek, which was named for Jessamine Douglas, a young lady murdered by the Indians on the banks of this stream; a blue grass county; not much timber; soil fertile; grain crops and Burley tobacco produced in large quantities; splendid live stock county; county seat, Nicholasville, population 2,935.

JOHNSON COUNTY.

Population 1900, 13,730; 1910, 17,482; per cent. increase 27.3. Assessed acreage of land 184,503 (United States census 171,520). Total assessed valuation taxable property \$3,308,031. Assessed value of land with improvements \$1,872,798. Average assessed value of land per acre \$10.15 (United States census \$11.55). Railroads, C. & O. 17.54, Miller's Creek 4.33, total mileage 21.87; located in the extreme eastern portion of the State; formed in 1843, and named for Colonel Richard Mentor Johnson; a mountainous county; considerable timber left; coal and ore deposits large; farming area limited; the various coal mines furnish a splendid market for county produce; county seat, Paintsville, population 942.

KENTON COUNTY.

Population 1900, 63,591; 1910, 70,355; per cent. increase 10.6. Assessed acreage of land 96,484 (United States census 104,320). Total assessed valuation taxable property \$32,979,460. Assessed value of lands with improvements \$4,297,920. Average assessed value of land per acre \$44.55 (United States census \$38.10). Railroads, C. & O. 1.913, C., N. O. & T. P. 14.37, L. & N. 38.37, total mileage 54.653; located in the extreme northern middle section of the State; formed in 1840, and named for Simon Kenton; land mostly hilly; splendid dairy opportunities; garden truck produced in large quantities for Cincinnati, Covington and Newport markets; county seat, Independence, population 153; largest city, Covington, population 53,270.

KNOTT COUNTY.

Population 1900, 8,704; 1910, 10,791; per cent. increase 24. Assessed acreage of land 203,238 (United States census 222,270). Total assessed valuation taxable property \$2,354,906. Assessed value of land with improvements \$1,312,630. Average assessed value of land per acre \$6.46 (United States census \$6.98). No railroads in county; located in the eastern portion of the State; formed in 1884, and named for Governor J. Proctor Knott; land mountainous; much valuable timber left; coal and ore deposits large; farming area limited; the coal mines furnish a splendid market for country produce; county seat, Hindman, population 370.

KNOX COUNTY.

Population 1900, 17,372; 1910, 22,116; per cent. increase 27.3. Assessed acreage of land 197,710 (United States census 227,840). Total assessed valuation taxable property \$4,170,009. Assessed value of land with improvements \$2,284,121. Average assessed value of land per acre \$11.55 (United States census \$9.93). Railroads, L. & N. 27.89, Cumberland Ry. 12.90, total mileage 40.79; located in the southeastern portion of the State; formed in 1799, and named for General Henry Knox; lands mostly mountainous; some rich river and creek bottom land; some timber left; splendid vegetable county; live stock and fruit adapted to this county; county seat Barbourville, population 1,623.

LARUE COUNTY.

Population 1900, 10,764; 1910, 10,701; per cent. decrease .6. Assessed acreage of land 158,034 (United States census 184,320). Total assessed valuation taxable property \$3,388,597. Assessed value of land with improvements \$2,146,307. Average assessed value of land per acre \$13.58 (United States census \$19.31). Railroads, I. C. 4.75, L. & N. 4.45, total mileage 9.20; located in the west-central portion of the State; formed in 1843, and named for John LaRue; lands rolling to hilly, but fertile; little timber left; county seat, Hodgenville, population 744.

LAUREL COUNTY.

Population 1900, 17,592; 1910, 19,872; per cent. increase 13. Assessed acreage of land 239,117 (United States census 286,820). Total assessed valuation taxable property \$2,902,820. Assessed value of land with improvements \$1,583,144. Average assessed value of land per acre \$6.62 (United States census \$8.26). Railroads, L. & N. 30.36; located east of the central portion of the State; formed in 1825, and named from Laurel River, which was named for the plant called laurel, or rhododendron, that grows in great profusion along its banks; some bottom lands; some hilly, and some portions mountainous; some timber left; coal is mined in great quantities; fruit, live stock and poultry do well in this county; county seat, London, population 1,638.

LAWRENCE COUNTY.

Population 1900, 19,612; 1910, 20,067; per cent. increase 2.3. Assessed acreage of land 232,381 (United States census 270,492). Assessed value of land with improvements \$1,657,461. Average assessed value of land per acre \$7.13 (United States census \$7.77). Railroads, C. & O. 38.76, Eastern Ky. Ry. 1.33, total mileage 40.09; located in the extreme eastern portion of the State; formed in 1821, and named for Captain James Lawrence, of the United States Navy; land hilly to mountainous; some rich river and creek bottoms; the hills are of limestone foundation, and make splendid grazing lands; considerable timber left; coal and ore deposits; county seat, Louisa, population 1,356.

LEE COUNTY.

Population 1900, 7,988; 1910, 9,531; per cent. increase 19.3. Assessed acreage of land 128,245 (United States census 127,360). Total assessed valuation taxable property \$1,407,199. Assessed value of land with improvements \$676,548. Average assessed value of land per acre \$7.27 (United States census \$6.67). Railroads, L. & N. 49.44; a small county; located east of the central portion of the State; formed in 1869, and

named for General Robert E. Lee; coal and ore deposits; land hilly to mountainous; some valuable timber left; farming area limited; county seat, Beattyville, population 1,360.

LESLIE COUNTY.

Population 1900, 6,753; 1910, 8,976; per cent. increase 32.9. Assessed acreage of land 287,250 (United States census 238,720). Total assessed valuation taxable property \$2,359,219. Assessed value of land with improvements \$1,822,553. Average assessed value of land per acre \$6.34 (United States census \$6.90). No railroads in county; located in the southeastern portion of the State; formed in 1878, and named for Gov. Preston H. Leslie; generally hilly to mountainous; valuable timber; coal and ore deposits large; rich river and creek bottoms; live stock, fruit and vegetables chief products; county seat, Hyden, population 316.

LETCHER COUNTY.

Population 1900, 9,172; 1910, 10,623; per cent. increase 15.8. Assessed acreage of land 262,697 (United States census 227,220). Total assessed valuation taxable property \$4,303,789. Assessed value of land with improvements \$3,150,027. Average assessed value of land per acre \$11.99 (United States census \$6.43). Railroads, L. & N. 38.61, Sandy Valley & Elkhorn 6.70, total mileage 45.29; located in the southeastern portion of the State; formed in 1842, and named for Governor Robert P. Letcher; lands mountainous; valuable timber; large mineral deposits; both bituminous and cannel coal; live stock, fruits and vegetables adapted to this county; county seat, Whitesburg, population 321.

LEWIS COUNTY.

Population 1900, 17,868; 1910, 16,887; per cent. decrease 5.5. Assessed acreage of land 301,989 (United States census 314,240). Total assessed valuation taxable property \$3,018,732. Assessed value of land with improvements \$1,834,938. Average assessed value of land per acre \$6.07 (United States census \$9.71).

Railroads, C. & O. 56.38; located in the northeastern section of the State; formed in 1806, and named for Captain Meriwether Lewis; land level to hilly; some timber left; rich river and creek bottoms; the hilly land well adapted to fruit; a demonstration orchard of 1,350 acres was planted here in 1914 by the State Department of Agriculture to emphasize the splendid fruit lands of this county; second bottom lands produce large quantities of vegetables; county seat, Vanceburg, population 1,145.

LINCOLN COUNTY.

Population 1900, 17,059; 1910, 17,897; per cent. increase 4.9. Assessed acreage of land 196,331 (United States census 216,320). Total assessed valuation taxable property \$7,257,337. Assessed value of land with improvements \$4,587,446. Average assessed value of land per acre \$22.36 (United States census \$32.00). Railroads, C., N. O. & T. P. 13.83, L. & N. 26.90, total mileage 40.73; located in the south-central portion of the State; formed in 1780, and named for General Benjamin Lincoln; this county is one of the three original counties of the State; a blue grass county, with the land rolling; but little timber; splendid grazing land; grains and Burley tobacco produced in large quantities; county seat, Stanford, population 1,532.

LIVINGSTON COUNTY.

Population 1900, 11,354; 1910, 10,627; per cent. decrease 6.4. Assessed acreage of land 180,658 (United States census 250,880). Total assessed valuation taxable property \$3,054,380. Assessed value of land with improvements \$1,931,370. Average assessed value of land per acre \$10.69 (United States census \$11.75). Railroads, I. C. 3.97; located in the western portion of the State; formed in 1798, and named for Robert R. Livingston; lands hilly to level; but little timber left; rich river and creek bottoms; grain crops and dark tobacco produced; much attention is paid to live stock and poultry; county seat, Smithland, population 557; the Cumberland River flows into the Ohio in this county.

LOGAN COUNTY.

Population 1900, 25,994; 1910, 24,977; per cent. decrease 3.9. Assessed acreage of land 328,976 (United States census 411,520). Total assessed valuation taxable property \$6,208,175. Assessed value of land with improvements \$3,670,165. Average assessed value of land per acre \$11.16 (United States census \$19.68). Railroads, L. & N. 58.94; located in the southern part of the State; formed in 1792, and named for General Benjamin Logan; practically all the timber cut; land usually level; rich loam, with red clay sub-soil; splendid all around agricultural county; county seat, Russellville, population 3,111.

LYON COUNTY.

Population 1900, 9,319; 1910, 9,423; per cent. increase 1.1. Assessed acreage of land 145,884 (United States census 177,280). Total assessed valuation taxable property \$1,834,387. Assessed value of land with improvements \$1,066,749. Average assessed value of land per acre \$7.31 (United States census \$10.79). Railroads, I. C. 14.57; located in the western part of the State; formed in 1854, and named for Crittenden Lyon; land more or less rolling; county touched by both the Tennessee and Cumberland Rivers; some rich bottom lands; not a great deal of timber left; grain crops and dark tobacco produced; considerable attention paid to live stock and poultry; county seat, Eddyville, population 1,442; at Eddyville is located the State Penitentiary.

MADISON COUNTY.

Population 1900, 25,607; 1910, 26,951; per cent. increase 5.2. Assessed acreage of land 260,193 (United States census 285,440). Total assessed valuation taxable property \$13,768,600. Assessed value of land with improvements \$6,678,950. Average assessed value of land per acre \$33.35 (United States census \$41.62). Railroads, L. & N., 66.95; located in the central portion of State; formed in 1786, and named for James Madison, later President of the United States; a blue grass county; land rolling; not much timber; a splendid all-

around farming county; particular attention given to cattle raising and feeding; county seat Richmond; population 5,340; at Richmond is located the Eastern State Normal School, and at Berea, in this county, is located Berea College.

MAGOFFIN COUNTY.

Population 1900, 12,006; 1910, 13,654; per cent increase 13.7. Assessed acreage of land 225,683 (United States census 193,280). Total assessed valuation taxable property \$1,489,578. Assessed value of land with improvements \$955,771. Average assessed value of land per acre \$4.23 (United States census \$8.03). Railroads, (none in county); located in the eastern part of the State; formed in 1860, and named for Governor Beriah Magoffin; land hilly; considerable timber left; large deposits of coal and ore; good fruit section; county seat Salyersville; population 310.

MARION COUNTY.

Population 1900, 16,290; 1910, 16,330; per cent. increase .2. Assessed acreage of land 198,955 (United States census 220,800). Total assessed valuation taxable property \$5,266,539. Assessed value of land with improvements \$2,647,905. Average assessed value of land per acre \$13.30 (United States census \$23.29). Railroads, L. & N., 40.86; located in the central portion of State; formed in 1834, and named for General Francis Marion; a blue grass county; not much timber; land rolling; some "knob" land; splendid live stock county; county seat, Lebanon, population 3,077.

MARSHALL COUNTY.

Population 1900, 13,692; 1910, 15,771; per cent. increase 15.2. Assessed acreage of land 206,573 (United States census 209,280). Total assessed valuation taxable property \$3,379,361. Assessed value of land with improvements \$2,040,465. Average assessed value of land per acre \$9.87 (United States census \$15.15). Railroads, I. C., 12.20; N. C. & St. L., 17.99; total mileage 30.19; located in the western portion of the State; formed

in 1842, and named for Chief Justice John Marshall; land mostly level; not much timber; some rich river and creek bottom lands; live stock interest is large; county seat, Benton, population 824.

MARTIN COUNTY.

Population 1900, 5,780; 1910, 7,291; per cent. increase 26.1. Assessed acreage of land 231,147 (United States census 145,280). Total assessed valuation taxable property \$1,690,758. Assessed value of land with improvements \$931,222. Average assessed value of land per acre \$4.29 (United States census \$7.15). Railroads, (none in county); located in extreme eastern portion of State; formed in 1870, and named for Colonel John P. Martin; land mostly mountainous; well timbered; rich coal and ore deposits; lands considerably worn; county seat, Inez, population 381.

MASON COUNTY.

Population 1900, 20,446; 1910, 18,611; per cent. decrease 9. Assessed acreage of land 149,272 (United States census 145,280). Total assessed valuation taxable property \$10,908,705. Assessed value of land with improvements \$6,043,300. Average assessed value of land per acre \$40.49 (United States census \$62.30). Railroads, C. & O., 19.58; L. & N., 14.85; total mileage 34.43; located in the extreme northeastern section of the State; formed in 1788, and named for George Mason; practically no timber left; a blue grass county; land rolling and very fertile; the annual grain, live stock and Burley tobacco crops large; county seat, Maysville, population 6,141.

McCRACKEN COUNTY.

Population 1900, 28,733; 1910, 35,064; per cent. increase 22. Assessed acreage of land 152,728 (United States census 152,960). Total assessed valuation taxable property \$14,014,395. Assessed value of land with improvements \$3,050,205. Average assessed value of land per acre \$19.98 (United States census \$29.86). Railroads, I. C., 33.97; N. C. & St. L., 12.78; total mileage

46.75; located in the extreme western portion of the State; formed in 1824, and named for Captain Virgil McCracken; not much timber left; land level to rolling; well adapted to vegetable production, and to fruits; large crops of corn grown on the river bottoms; county seat, Paducah, population 22,760; Paducah is the largest city in the western portion of the State, and has some splendid manufacturing establishments.

MCCREARY COUNTY.

This county formed in 1912, and named for Governor James B. McCreary; assessed acreage of land 273,017. Total assessed valuation taxable property \$1,917,048. Assessed value of land with improvements \$1,415,100. Average assessed value of land per acre \$5.18. Located in the southeastern portion of the State; lands rough and well timbered; railroads, C. N. O. & T. P., 23.71; Kentucky & Tennessee R. R., 16.27; total mileage, 39.98; county seat, Whitley City, population 300. The county seat was selected after a long drawn-out fight between Pine Knot and the present location. This county has been formed since the 1910 census.

MCLEAN COUNTY.

Population 1900, 12,448; 1910, 13,341; per cent. increase 6.4. Assessed acreage of land 140,614 (United States census 161,920). Total assessed valuation taxable property \$2,875,883. Assessed value of land with improvement \$1,719,180. Average assessed value of land per acre \$12.27 (United States census \$22.24). Railroads, L. & N., 11.36; located in the middle-west section of the State; formed in 1854, and named for Judge Alvey McLean; land generally level; but little timber left; some coal; soil adapted to grain and fruit; county seat, Calhoun, population 742.

MEADE COUNTY.

Population 1900, 10,533; 1910, 9,783; per cent. decrease 7.1. Assessed acreage of land 192,906 (United States census 192,640). Total assessed valuation taxable property \$3,107,761. Assessed value of land with

improvements \$1,774,629. Average assessed value of land per acre \$9.28 (United States census \$11.67). Railroads, I. C., 2.69; L. H. & St. L., 22.70; total mileage 25.39; located in the northwestern portion of the State; formed in 1823, and named for Captain James Meade; land rolling to hilly; not much timber; a good fruit section; county seat, Brandenburg, population 482.

MENIFEE COUNTY.

Population 6,818; 1910, 6,153; per cent. decrease 9.8. Assessed acreage of land 107,065 (United States census 129,920). Total assessed valuation taxable property \$978,601. Assessed value of land with improvements \$492,208. Average assessed value of land per acre \$4.59 (United States census \$5.74). Railroads C. & O. 6.31; located in the middle-eastern section of State; formed in 1869, and named for Richard H. Menifee; some timber left; lands level to mountainous; good live stock section; county seat, Frenchburg, population 173.

MERCER COUNTY.

Population 1900, 14,426; 1910, 14,063; per cent. decrease 2.5. Assessed acreage of land 165,359 (United States census 169,920). Total assessed valuation taxable property \$8,344,760. Assessed value of land with improvements \$5,384,612. Average assessed value of land per acre \$32.90 (United States census \$41.94). Railroads, C. N. O. & T. P., 8.14; Sou. Ry. in Ky., 22.049; total mileage 30.18; located in the central portion of the State; formed in 1785, and named for General Hugh Mercer; practically no timber left; a blue grass county; land rolling; fertile and well watered; the annual grain, live stock and Burley tobacco crops large; county seat, Harrodsburg, population 3,147.

METCALFE COUNTY.

Population 1900, 9,988; 1910, 10,453; per cent. increase 4.7. Assessed acreage of land 145,850 (United States census 193,920). Total assessed valuation taxable property \$1,676,630. Assessed value of land with improvements \$1,132,859. Average assessed value of

land per acre \$7.76 (United States census \$12.20). No railroads in county; located in the southern portion of the State; formed in 1860, and named for Governor Thomas Metcalfe; some timber left; land rolling to hilly; splendid live stock county; county seat, Edmonton; population 300.

MONROE COUNTY.

Population 1900, 13,053; 1910, 13,663; per cent. increase 4.7. Assessed acreage of land 160, 747 (United States census 282,240). Total assessed valuation taxable property \$2,424,715. Assessed value of land with improvements \$1,512,480. Average assessed value of land per acre \$9.40 (United States census \$8.26). No railroads in county; located in the southern portion of the State; formed in 1820, and named for James Monroe, President of the United States; some timber left; lands hilly; rich river and creek bottoms; splendid live stock county; county seat, Tompkinsville, population 639.

MONTGOMERY COUNTY.

Population 1900, 12,834; 1910, 12,868; per cent. increase .3. Assessed acreage of land 120,822 (United States census 126,720). Total assessed valuation taxable property \$7,146,623. Assessed value of land with improvements \$4,106,546. Average assessed value of land per acre \$33.98 (United States census \$56.77). Railroads, C. & O., 26.22; located in the middle-eastern section of the State; formed in 1796, and named for General Richard Montgomery; a blue grass county; not much timber left; land rolling; lands mostly devoted to the production of live stock and the grain crops; county seat, Mt. Sterling, population 3,932.

MORGAN COUNTY.

Population 1900, 12,792; 1910, 16,259; per cent. increase 27.1. Assessed acreage of land 226,935 (United States census 233,600). Total assessed valuation taxable property \$2,749,590. Assessed value of land with improvements \$1,871,707. Average assessed value of

land per acre \$8.20 (United States census \$8.60). Railroads, Caney Valley, 12.80; Morehead & North Fork R. R., 9.50; Ohio & Kentucky Railroad 4.94; total mileage 27.24; located in the eastern portion of the State; formed in 1822, and named for General Daniel Morgan; some timber; lands hilly; devoted to the production of grain crops and live stock; county seat, West Liberty, population 442.

MUHLENBERG COUNTY.

Population 1900, 20,741; 1910, 28,598; per cent. increase 37.9. Assessed acreage of land 334,856 (United States census 302,080). Total assessed valuation taxable property \$4,277,999. Assessed value of land with improvements \$2,140,044. Average assessed value of land per acre \$6.38 (United States census \$11.72). Railroads, I. C., 26.05; Kentucky Midland R. R., 9.11; L. & N., 40.08; total mileage 75.24; located in the south-central portion of the State; formed in 1798, and named for Peter Muhlenberg; but little timber left; lands hilly; is in the western coal field; land devoted to the production of grain and live stock; county seat, Greenville, population 1,604.

NELSON COUNTY.

Population 1900, 16,587; 1910, 16,830; per cent. increase 1.5. Assessed acreage of land 246,756 (United States census 263,040). Total assessed valuation taxable property \$7,814,640. Assessed value of land with improvements \$4,275,753. Average assessed value of land per acre \$17.73 (United States census \$20.76). Railroads, L. & N., 54.62; located in the central portion of the State; formed in 1784, and named for Thomas Nelson, ex-Governor of Virginia; land rolling to hilly; practically no timber; part of the county in the blue grass region, and part in the pennyroyal region; live stock industry is large; a good dairy section; grain and tobacco crops raised in large quantities; county seat, Bardstown, population 2,126.

NICHOLAS COUNTY.

Population 1900, 11,952; 1910, 10,601; per cent. decrease 11.3. Assessed acreage of land 122,169 (United States census 133,120). Total assessed valuation taxable property \$4,722,427. Assessed value of land with improvements \$3,159,732. Average assessed value of land per acre \$25.86 (United States census \$50.89). Railroads, L. & N., 15.75; located in the north-central portion of the State; formed in 1799, and named for Colonel George Nicholas; land rolling to hilly; practically no timber; live stock interests large; grain and Burley tobacco produced in large quantities; county seat, Carlisle, population 1,293.

OHIO COUNTY.

Population 1900, 27,287; 1910, 27,642; per cent. increase 1.3. Assessed acreage of land 354,622 (United States census 373,760). Total assessed valuation taxable property \$5,491,839. Assessed value of land with improvements \$3,133,810. Average assessed value of land per acre \$8.84 (United States census \$9.97). Railroads, I. C., 47.64; L. H. & St. L., 5.70; L. & N., 30.65; total mileage 83.99; located in the western-central portion of the State; formed in 1798, and named for the Ohio river; some timber left; this county is in the western coal area; lands devoted to the production of live stock, grain and Burley tobacco; county seat, Hartford, population 976.

OLDHAM COUNTY.

Population 1900, 7,078; 1910, 7,248; per cent. increase 2.4. Assessed acreage of land 115,771 (United States census 115,200). Total assessed valuation taxable property \$4,514,243. Assessed value of land with improvements \$2,610,395. Average assessed value of land per acre \$22.55 (United States census \$30.12). Railroads, L. & N., 16.44; Louisville & Interurban Ry., 10.932; total mileage 27.372; located in the north-central portion of the State; formed in 1823, and named for Colonel William Oldham; practically no timber left; land rolling to hilly; especially adapted to fruit and vegetable produc-

tion; splendid dairy opportunities; land adapted to the production of grain and tobacco, but owing to the proximity to Louisville, more attention is paid to the production of vegetables and to dairying; county seat, LaGrange, population 1,152.

OWEN COUNTY.

Population 1900, 17,553; 1910, 14,248; per cent. decrease 18.8. Assessed acreage of land 219,816 (United States census 234,880). Total assessed valuation taxable property \$3,366,294. Assessed value of land with improvements \$2,342,035. Average assessed value of land per acre \$10.65 (United States census \$21.98). Railroads (none in county); located in the central portion of the State; formed in 1819, and named for Colonel Abraham Owen; not much timber left; land hilly; in the blue grass section; produces a fine quality of Burley tobacco; a great deal of attention paid to live stock; county seat, Owenton, population 1,024.

OWSLEY COUNTY.

Population 1900, 6,874; 1910, 7,979; per cent. increase 16.1. Assessed acreage of land 111,613 (United States census 138,240). Total assessed valuation taxable property \$1,089,939. Assessed value of land with improvements \$713,392. Average assessed value of land per acre \$6.39 (United States census \$6.65). No railroads in county; located in the middle-eastern portion of the State; formed in 1843, and named for Judge William Owsley, afterwards Governor; lands hilly to mountainous; considerable timber left; rich coal deposits; great deal of attention paid to live stock; splendid fruit section; county seat, Booneville, population 236.

PENDLETON COUNTY.

Population 1900, 14,947; 1910, 11,985; per cent. decrease 19.8. Assessed acreage of land 175,548 (United States census 178,560). Total assessed valuation taxable property \$4,295,893. Assessed value of land with improvements \$2,499,775. Average assessed value of land per acre \$14.24 (United States census \$19.92). Rail-

roads, C. & O., 3.08; L. & N., 25.31; total mileage 28.39; located in the north-central portion of the State; formed in 1798, and named for Edmond Pendleton, of Virginia; lands level to hilly; not much timber left; alfalfa and seed clover do well on the hills of this county; a great deal of attention paid to the production of live stock and tobacco; county seat, Falmouth, population 1,180.

PERRY COUNTY.

Population 1900, 8,276; 1910, 11,255; per cent. increase 36. Assessed acreage of land 477,700 (United States census 214,400). Total assessed valuation taxable property \$3,378,841. Assessed value of land with improvements \$2,351,976. Average assessed value of land per acre \$4.97 (United States census \$7.13). Railroads, L. & N., 40.39; located in the southeastern portion of the State; formed in 1820, and named for Commodore Oliver Hazard Perry, of the United States navy; lands mountainous and well timbered; coal deposits very large; not much attention paid to farming; splendid fruit section; county seat, Hazard, population 537.

PIKE COUNTY.

Population 1900, 22,686; 1910, 31,679; per cent. increase 39.6. Assessed acreage of land 763,761 (United States census 498,560). Total assessed valuation taxable property \$7,348,440. Assessed value of land with improvements \$4,804,113. Average assessed value of land per acre \$6.29 (United States census \$8.82). Railroads, Big Sandy & Cumberland River, 8; C. & O., 42.19; Norfolk and Western Ry., 3.75; Sandy Valley & Elkhorn, 23.78; Williamson & Pond Creek R. R., 11.93; total mileage 89.65; located in the extreme eastern portion of the State; formed in 1821, and named for General Zebulon M. Pike; a mountainous county with a large area; large amount of timber left; coal deposits very extensive; no great amount of attention paid to farming; lands well adapted to the production of fruit and grazing of live stock; county seat, Pikeville, population, 1,280.

POWELL COUNTY.

Population 1900, 6,443; 1910, 6,268; per cent. decrease 2.7. Assessed acreage of land 83,591 (United States census 115,840). Total assessed valuation taxable property \$926,016. Assessed value of land with improvements \$488,309. Average assessed value of land per acre \$5.84 (United States census \$15.89). Railroads, L. & N., 23.88; Mountain Central R. R., 3; total mileage 26.88; located in the middle eastern portion of the State; formed in 1852, and named for Governor Lazarus W. Powell; some timber left; lands level to hilly; the river and creek bottom lands fertile; land on top of hills not very fertile; splendid fruit county; county seat, Stanton, population 278.

PULASKI COUNTY.

Population 1900, 31,293; 1910, 35,986; per cent. increase 15. Assessed acreage of land 317,641 (United States census 498,560). Total assessed valuation taxable property \$6,300,508. Assessed value of land with improvements \$2,744,693. Average assessed value of land per acre \$8.64 (United States census \$7.86). Railroads, C. N. O. & T. P., 30.99; Cincinnati, Burnside & Cumberland River 1.35; total mileage 32.34; located in the southern portion of the State; formed in 1798, and named for Count Pulaski; lands hilly; some timber left; splendid live stock county; good fruit lands; county seat, Somerset, population 4,491.

ROBERTSON COUNTY.

Population 1900, 4,900; 1910, 4,121; per cent. decrease 15.9. Assessed acreage of land 61,928 (United States census 69,760). Total assessed valuation taxable property \$1,106,222. Assessed value of land with improvements \$809,097. Average assessed value of land per acre \$13.06 (United States census \$13.82). No railroads in the county; located in the northeastern section of the State; formed in 1867, and named for ex-Chief Justice George Robertson; lands hilly; not much timber; alfalfa and seed clover do well on the hills on account of the underlying limestone; splendid live stock and fruit county; county seat, Mt. Olivet, population 321.

ROCKCASTLE COUNTY.

Population 1900, 12,416; 1910, 14,473; per cent. increase 16.6. Assessed acreage of land 168,725 (United States census 198,400). Total assessed valuation taxable property \$1,764,768. Assessed value of land with improvements \$1,029,443. Average assessed value of land per acre \$6.10 (United States census \$7.45). Railroads, L. & N. R. R., 39.61; located in the southern portion of the State; formed in 1810, and named for Rockcastle river; lands hilly, with some timber; one of the best fruit counties in the State; the land is thin, as a rule; county seat, Mt. Vernon, population 930. Brodhead is a prosperous little town in a good farming section of the county.

ROWAN COUNTY.

Population 1900, 8,277; 1910, 9,438; per cent. increase 14.10. Assessed acreage of land 163,937 (United States census 174,080). Total assessed valuation taxable property \$1,380,779. Assessed value of land with improvements \$638,426. Average assessed value of land per acre \$3.89 (United States census \$4.39). Railroads, C. & O., 16.73; Morehead & North Fork R. R., 14.50; total mileage 31.23; located in the eastern section of the State; formed in 1856, and named for Judge John Rowan; lands rolling to hilly; not much timber left; is a great fruit county; in the spring of 1913, 1,650 acres of apple trees were planted in this county by the State Department of Agriculture; land well adapted to grazing purposes; county seat, Morehead, population 1,105.

RUSSELL COUNTY.

Population 1900, 9,695; 1910, 10,861; per cent. increase 12. Assessed acreage of land 155,197 (United States census 210,560). Total assessed valuation taxable property \$1,972, 845. Assessed value of land with improvements \$1,231,194. Average assessed value of land per acre \$7.93 (United States census \$8.40). No railroads in the county; located in the southern portion of the State; formed in 1825, and named for Colonel William Russell; lands rolling to hilly; some timber; land adapted to grazing; some rich bottom lands; a good fruit county; county seat, Jamestown, population 177.

SCOTT COUNTY.

Population 1900, 18,076; 1910, 16,956; per cent. decrease 6.2. Assessed acreage of land 178,409 (United States census 184,960). Total assessed valuation taxable property \$10,022,922. Assessed value of land with improvements \$6,290,617. Average assessed value of land per acre \$35.25 (United States census \$56.28). Railroads, C. N. O. & T. P., 22.21; F. & C. R. R., 20.78; Kentucky Traction & Terminal Co., 5.64; Sou. Ry. in Ky., 7.60; L. & N., 1.95; total mileage 58.18; located in the central portion of the State; formed in 1792, and named for General Charles Scott, later Governor; a blue grass county; land rolling; limestone formation; not much timber; splendid livestock county; a great deal of Burley tobacco produced; grain crops do well; county seat, Georgetown, population 4,533.

SHELBY COUNTY.

Population 1900, 18,340; 1910, 18,041; per cent. decrease 1.6. Assessed acreage of land 240,289 (United States census 273,280). Total assessed valuation taxable property \$13,883,040. Assessed value of land with improvements \$9,049,525. Average assessed value of land per acre \$37.70 (United States census \$50.65). Railroads, L. & N., 40.03; L. & I. R. R., 11.361; Sou. Ry. in Ky., 24.299; total mileage 77.69; located in the central portion of the State; formed in 1792, and named for Isaac Shelby, first Governor of Kentucky; a blue grass county; land rolling, and mostly devoted to the growing of grains and Burley tobacco; a great live stock county; practically no timber; dairy interest large; this county known as the "Jersey Isle of America;" more registered cattle said to be contained in this county than any other county in America; county seat, Shelbyville, population 3,412.

SIMPSON COUNTY.

Population 1900, 11,624; 1910, 11,460; per cent. decrease 1.4. Assessed acreage of land 144,340 (United States census 138,240). Total assessed valuation taxable property \$3,460,734. Assessed value of land with improvements \$1,754,992. Average assessed value of

land per acre \$12.45 (United States census \$27.83). Railroads, L. & N., 14.21; L. & I., .26; total mileage 14.47; located in the southern portion of the State; formed in 1819, and named for Captain John Simpson; land mostly level; not much timber; soil fertile; grain crops and dark tobacco grown in abundance; county seat, Franklin, population 3,063.

SPENCER COUNTY.

Population 1900, 7,406; 1910, 7,567; per cent. increase 2.2. Assessed acreage of land 116,642 (United States census 119,400). Total assessed valuation taxable property \$3,005,889. Assessed value of land with improvements \$1,867,795. Average assessed value of land per acre \$16.20 (United States census \$29.25). Railroads, L. & N., 13.52; located in the central portion of State; formed in 1824, and named for Captain Speer Spencer; lands rolling to hilly; not much timber; grain crops and Burley tobacco produced in abundance; dairy interest large; county seat, Taylorsville, population 622.

TAYLOR COUNTY.

Population 1900, 11,075; 1910, 11,961; per cent. increase 8. Assessed acreage of land 165,172 (United States census 178,560). Total assessed valuation taxable property \$2,017,400. Assessed value of land with improvements \$1,113,092. Average assessed value of land per acre \$6.95 (United States census \$14.26). Railroads, L. & N., 12.59; located in the south-central portion of the State; formed in 1848, and named for General Zachary Taylor, afterwards President of the United States; land rolling to hilly; not much timber; splendid live stock county; grain crops and Burley tobacco grown; county seat, Campbellsville, population 1,206.

TODD COUNTY.

Population 1900, 17,371; 1910, 16,488; per cent. decrease 5.1. Assessed acreage of land 224,189 (United States census 234,880). Total assessed valuation taxable property \$3,963,545. Assessed value of land with improvements \$2,381,735. Average assessed value of

land per acre \$10.62 (United States census \$18.38). Railroads, L. & N., 20.30; Elkton & Guthrie R. R., 10.92; total mileage 31.22; located in the southern portion of State; formed in 1819, and named for Colonel John Todd; land mostly level; practically no timber; fertile soil; grain crops and dark tobacco grown; splendid live stock county; county seat, Elkton, population 1,228.

TRIGG COUNTY.

Population 1900, 14,073; 1910, 14,539; per cent. increase 3.3. Assessed acreage of land 281,076 (United States census 273,920). Total assessed valuation taxable property \$3,149,941. Assessed value of land with improvements \$2,058,339. Average assessed value of land per acre \$7.32 (United States census \$8.60). Railroads, I. C., 8.67; Cadiz R. R., 10.00; total mileage 18.67; located in the southern portion of State; formed in 1820, and named for Colonel Stephen Trigg; land mostly level; some hilly lands; but little timber; grain crops and dark tobacco produced; good live stock county; county seat, Cadiz, population 1,005.

TRIMBLE COUNTY.

Population 1900, 7,272; 1910, 6,512; per cent. decrease 10.5. Assessed acreage of land 90,073 (United States census 98,560). Total assessed valuation taxable property \$1,852,043. Assessed value of land with improvements \$1,413,799. Average assessed value of land per acre \$15.69 (United States census \$19.87). No railroads in county; located in the extreme north-central portion of the State; formed in 1836, and named for Judge Robert Trimble; land rolling to hilly; not much timber; some rich bottom lands; a good fruit county; grain crops and live stock principal interests; county seat, Bedford, population 269.

UNION COUNTY.

Population 1900, 21,326; 1910, 19,886; per cent. decrease 6.8. Assessed acreage of land 211,228 (United States census 208,000). Total assessed valuation taxable property \$9,681,080. Assessed value of land with

improvements \$5,913,930. Average assessed value of land per acre \$20.79 (United States census \$43.53). Railroads, I. C., 42.66; L. & N., 13.21; total mileage 55.87; located in the western portion of the State; formed in 1811, and called "Union," because of the hearty unanimity with which the people consented to the division of the old county; it was formed entirely out of the western part of Henderson county; land mostly level; not much timber; rich coal deposits; corn and other grain crops produced in abundance; some attention paid to fruit; soil very fertile; county seat, Morganfield, population 2,725.

WARREN COUNTY.

Population 1900, 29,970; 1910, 30,579; per cent. increase 2.2. Assessed acreage of land 334,098 (United States census 339,200). Total assessed valuation taxable property \$13,121,624. Assessed value of land with improvements \$6,053,176. Average assessed value of land per acre \$18.11 (United States census \$25.97). Railroads, L. & N., 38.82; located in the southern portion of State; formed in 1796, and named for General Joseph Warren; land rolling to hilly; not much timber; fertile soil; one of the best all-around farming counties in the State; the strawberry production of this county is the greatest of any county in Kentucky, more than one hundred car loads shipped each year; Bowling Green limestone is noted the world over as a building stone; the Governor's new Mansion at Frankfort, Kentucky, erected at a cost of \$100,000, is built of this stone; county seat, Bowling Green, population 9,173. At Bowling Green is located the Western State Normal School.

WASHINGTON COUNTY.

Population 1900, 14,182; 1910, 13,940; per cent. decrease 1.7. Assessed acreage of land 173,032 (United States census 191,360). Total assessed valuation taxable property \$4,980,125. Assessed value of land with improvements \$3,232,495. Average assessed value of land per acre \$13.42 (United States census \$30.90). Railroads, L. & N., 11.37; located in the south-central portion

of the State; formed in 1792, and named for George Washington, first President of the United States; land rolling to hilly; not much timber; a blue grass county; limestone formation; soil fertile; grain crops and Burley tobacco produced in abundance; splendid live stock county; county seat, Springfield, population 1,329.

WAYNE COUNTY.

Population 1900, 14,892; 1910, 17,518; per cent. increase 17.6. Assessed acreage of land 283,743 (United States census 377,600). Total assessed valuation taxable property \$3,806,313. Assessed value of land with improvements \$1,905,165. Average assessed value of land per acre \$6.71 (United States census \$8.96). Railroads (none in county); located in the southern portion of the State; formed in 1800, and named for General Anthony Wayne; land rolling to hilly; some timber left; it is in the oil belt, and said to be the largest oil-producing county in the State; a great live stock county; all the grain crops and dark tobacco produced; county seat, Monticello, population 1,338.

WEBSTER COUNTY.

Population 1900, 20,097; 1910, 20,974; per cent. increase 4.4. Assessed acreage of land 207,852 (United States census 220,160). Total assessed valuation taxable property \$4,671,705. Assessed value of land with improvements \$2,374,005. Average assessed value of land per acre \$11.42 (United States census \$24.28). Railroads, I. C., 20.50; L. & N., 25.80; Ky. Valley R. R., 9.38; total mileage 55.68; located in the western portion of the State; formed in 1860, and named for Daniel Webster; land level to hilly; some timber; located in the western coal field; lands mostly devoted to growing grain crops and dark tobacco; live stock interests important; county seat, Dixon, population 741.

WHITLEY COUNTY.

Population 1900, 25,015; 1910, 31,892; per cent. increase 27.9. Assessed acreage of land 273,720 (United States census 374,400). Total assessed valuation tax-

able property \$5,396,721. Assessed value of land with improvements \$2,150,504. Average assessed value of land per acre \$7.89 (United States census \$8.68). Railroads, L. & N., 65.40; located in the southeastern portion of the State; formed in 1818, and named for Colonel William Whitley; considerable timber; large coal deposits; land hilly to mountainous; bottom lands fertile; splendid fruit county; county seat, Williamsburg, population 2,004.

WOLFE COUNTY.

Population 1900, 8,764; 1910, 9,864; per cent. increase 12.6. Assessed acreage of land 129,154 (United States census 147,200). Total assessed valuation taxable property \$1,457,556. Assessed value of land with improvements \$797,163. Average assessed value of land per acre \$6.17 (United States census \$7.65). Railroads, L. & N., 5.79; Mountain Central R. R., 9.00; Ohio & Ky. Ry., 6.87; total mileage 21.66; located in the eastern portion of the State; formed in 1860, and named for Nathaniel Wolfe; lands hilly; some timber; coal and ore deposits; river and creek bottoms fertile; other lands thin; a live stock and fruit area; county seat, Campton, population 326.

WOODFORD COUNTY.

Population 1900, 13,134; 1910, 12,571; per cent. decrease 4.3. Assessed acreage of land 117,212 (United States census 224,800). Total assessed valuation taxable property \$11,381,040. Assessed value of land with improvements \$6,977,329. Average assessed value of land per acre \$59.52 (United States census \$75.25). Railroads, Ky. Traction & Terminal Co., 13.88; Ky. Highlands Ry., 11.67; L. & N. R. R., 17.10; Sou. Ry. in Ky., 21.185; total mileage 63.83; located in the central portion of the State; formed in 1788, and name for General William Woodford; lands rolling; practically no timber; lands fertile, it being a blue grass county; limestone formation; known as the "Asparagus Bed of the World;" live stock interests large; grain and Burley tobacco produced in large quantities; county seat, Versailles, population 2,268.

PART TWO

—

DEPARTMENTAL WORK

DEPARTMENTAL WORK,

FARMERS' INSTITUTES.

The State Board of Agriculture has continued its policy of holding under the General Statutes of Kentucky a State Farmers' Institute annually. It has caused to be held county institutes in a majority of the counties of the State each year, but has only held these institutes where there was a demand for same and where co-operation was furnished by the local authorities. The great good done by these institutes is beyond question. They vary in their usefulness in the different counties, but where a county has once held a good institute as a rule it will continue to do so. The entire removal of politics from these meetings has given great confidence in their usefulness to the people and more loyal support has been given by the local authorities. It has been the policy of the State Board of Agriculture to have a lady lecturer at each of these Farmers' Institutes, and this has added materially in interesting both the men and women in better home life in the rural districts. Where there have been chautauquas held it has been the purpose of this department to co-operate with such authorities as had these meetings in charge. The State Farmers' Institute held at Henderson, Kentucky, in 1915 was one of the greatest agricultural meetings ever held in Kentucky. The records of this office show that the County Farmers' Institute held in one county in this State in the opinion of the farmers of that community has revolutionized the agricultural affairs in that section. With approximately five hundred names from this locality asking that an institute be held there again shows the interest taken in the work at this place. On the other hand, there are counties where it is difficult for the lecturers to get an audience. The good seed sown, however, if only in a few spots, continues to bring forth splendid results.

INSTITUTES.

OFFICERS STATE FARMERS' INSTITUTE—1914.

Hugh Dawson, Olmstead, Ky.....	President
Chas. E. Marvin, Paynes Depot, Ky.....	1st Vice-Pres.
Joe C. Van Meter, Lexington, Ky.....	2nd Vice-Pres.
L. Y. Woodruff, Murray, Ky.....	3rd Vice-Pres.
Christy Park, Frankfort, Ky.....	Secretary

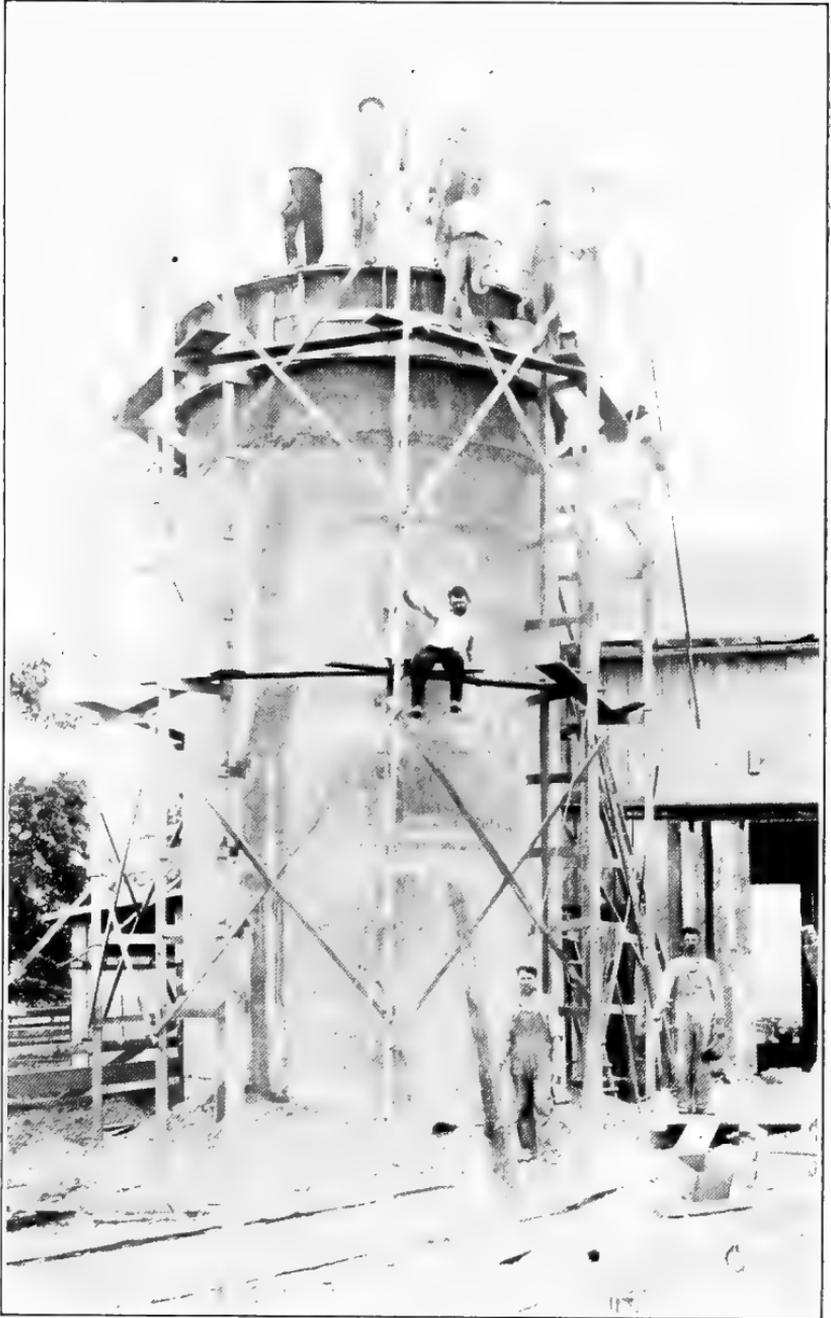
COUNTY INSTITUTES 1913-1914.

The following is a list of the counties where institutes have been held during the latter half of 1913, and the first half of 1914, and the officers elected, where same was reported to this department:

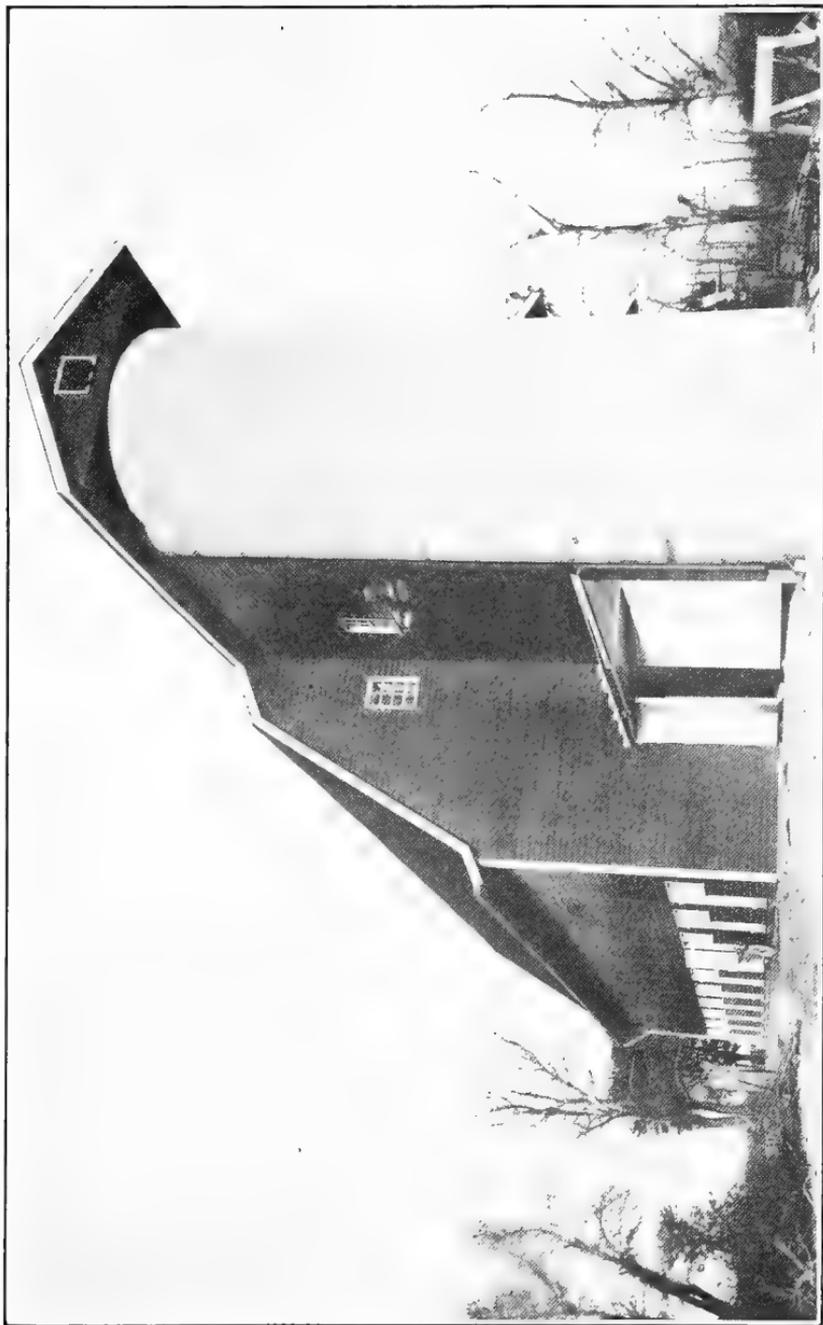
- Adair County—James English, Columbia, President; Ores Borger, Columbia, Secretary.
- Allen County—Joe Meredith, Holland, President; W. L. Motley, Scottsville, Secretary.
- Ballard County—Hardy Nance, Wickliffe, President; W. S. Roach, Barlow, Secretary.
- Bath County—W. S. Gudgel, Owingsville, President; C. W. Tipton, Owingsville, Secretary.
- Barren County—Dolph Depp, Glasgow, President; H. P. Chamberlin, Glasgow, R. No. 7, Secretary.
- Bell County—B. A. Fuson, Pineville, President; H. B. Jones, Pineville, Secretary.
- Boone County—John C. Bedinger, Walton, President; R. O. Hughes, Richwood, Secretary.
- Boyd County—Jesse Cyrus, Durbin, President; John Haney, Catlettsburg, Secretary.
- Breathitt County—W. H. Blanton, Jackson, President; Sanford Brown, Noctor, Secretary.
- Bullitt County—J. T. Lee, Shepherdsville, President; Mrs. R. L. Troutman, Shepherdsville, Secretary.

- Caldwell County—L. Wyatt, Fredonia, President; L. B. Sims, Princeton, Secretary.
- Calloway County—L. Y. Woodruff, Murray, President; Wallace Futrell, Almo, Secretary.
- Carlisle County—Institute held at Bardwell, Kentucky; W. J. S. Denton, Bardwell, Secretary. Institute held at Milburn, Kentucky; Jewell Edrington, Arlington, President; W. J. S. Denton, Bardwell, Secretary.
- Carroll County—C. C. Collins, Worthville, Delegate; Geo. Wood, Worthville, Delegate.
- Christian County—E. A. Hail, Pembroke, President; Geo. P. Rivers, Pembroke, Secretary.
- Clark County—A. T. Tucker, Winchester, President; James Mundy, Winchester, Secretary.
- Crittenden County—J. P. Price, Marion, President; W. L. Terry, Marion, Secretary.
- Daviess County—John L. Johnson, Hawesville, President; Louis E. Carrico, Knottsville, Secretary.
- Elliott County—J. W. Sparks, Sandy Hook, President; Mrs. Mollie Green, Sandy Hook, Secretary.
- Estill County—Dr. C. Marcum, Irvine, President; J. R. White, Irvine, Secretary.
- Fulton County—John L. Smith, Fulton, President; M. J. Browder, Fulton, Secretary.
- Garrard County—L. G. Davidson, Lancaster, Secretary.
- Graves County—C. C. Richmond, Water Valley, President; H. C. Holmes, Mayfield, Secretary.
- Grayson County—R. G. McGrew, Leitchfield, President; O. F. Hughes, Leitchfield, Secretary.
- Green County—S. T. Gorin, Greensburg, President; W. H. Graham, Greensburg, Secretary.
- Greenup County—E. E. Fullerton, Greenup, President; L. R. McCarty, Greenup, Secretary.
- Hardin County—Samuel Fischer, Tunnel Hill, President; H. B. Stewart, Elizabethtown, Secretary.
- Harlan County—A. E. Boggs, Harlan, President; Horace E. McSwain, Harlan, Secretary.
- Hart County—C. T. Bungardner, Munfordville, President; W. H. Strange, Munfordville, Secretary.
- Hickman County—K. M. Leath, Wingo, Member; W. M. Ward, Clinton, Member.
- Jefferson County—E. M. Coleman, Anchorage, R. No. 16, President; J. C. Coleman, O'Bannon, Secretary.
- Johnson County—Milton McDowell, Manilla, President; N. W. Williams, Paintsville, Secretary.
- Larue County—Jas. G. Terhune, Buffalo, President; Guy M. Hudgins, Buffalo, Secretary.
- Lee County—William Robinson, Beattyville, President; I. McGuire, Beattyville, Secretary.
- Letcher County—S. J. Hale, Whitesburg, Secretary. (Election of President not reported.)
- Lincoln County—J. M. Pettus, Stanford, President; C. E. Tate, Stanford, Secretary.
- Livingston County—W. E. Chipp, Bayou, President; W. E. Abell, Birds-ville, Secretary.
- Logan County—L. H. Dawson, Olmstead, President; J. N. Flowers, Oakville, Secretary.
- Lyon County—A. C. Raney, Eddyville, President; H. Glenn, Kuttawa, Secretary.

- Madison County—J. W. Herndon, Berea, President; Jesse Bough, Berea, Secretary.
- Marshall County—W. M. Faust, Benton, President; J. M. Bean, Benton, Secretary.
- Marion County—W. C. Rogers, Lebanon, Member; Professor J. W. Clarkson, Lebanon, Member.
- McCracken County—M. B. Tapp, Heath, President; Jesse Lawrence, Kevil, Secretary.
- Meade County—A. J. Thompson, Guston, President; I. M. Wilson, Guston, Secretary.
- Menifee County—J. H. Williams, Frenchburg, President; S. M. Williams, Frenchburg, Secretary.
- Montgomery County—Clayton Howell, Mt. Sterling, Member; H. R. Prewitt, Mt. Sterling, Member.
- Morgan County—J. C. Ferguson, West Liberty, President; J. H. Sebastian, West Liberty, Secretary.
- Muhlenberg County—G. H. Holeman, Weatherford, Member; P. J. Ford, Weatherford, Member.
- Ohio County—Henry Leach, Hartford, President; J. L. Brown, Rockport, Secretary.
- Oldham County—S. E. DeHaven, LaGrange, President. (Election of Secretary not reported.)
- Owen County—Wm. Gheightley, Owenton, President; L. B. Kinney, Owenton, Secretary.
- Perry County—J. A. Conyers, Hazard, President; Clyda Baker, Hazard, Secretary.
- Pike County—J. R. Sword, Pikeville, President; Jerome Danron, Yeager, Secretary.
- Rockcastle County—George D. Moore, Brodhead, President; G. S. Griffin, Mt. Vernon, Secretary.
- Rowan County—M. T. Dillon, Rodbourn, President; B. P. Ham, Cranstons, Secretary.
- Simpson County—Dr. J. R. Claypool, Franklin, President; Volney Jameson, Franklin, Secretary.
- Taylor County—J. H. Wade, Campbellsville, President; Henry R. Turner, Campbellsville, Secretary.
- Todd County—Will Hollins, Elkton, President; Porter C. Wood, Elkton, Secretary.
- Trigg County—Jas. D. Griner, Cadiz, President; A. L. Hall, Cadiz, Secretary.
- Trimble County—A. E. King, Milton, President; B. F. Snyder, Milton, R. F. D. No. 2, Secretary.
- Union County—W. A. French, Morganfield, President; Sam Clements, Uniontown, Secretary.
- Webster County—Henry Powell, Sebree, President; R. B. McGregor, Sebree, Secretary.



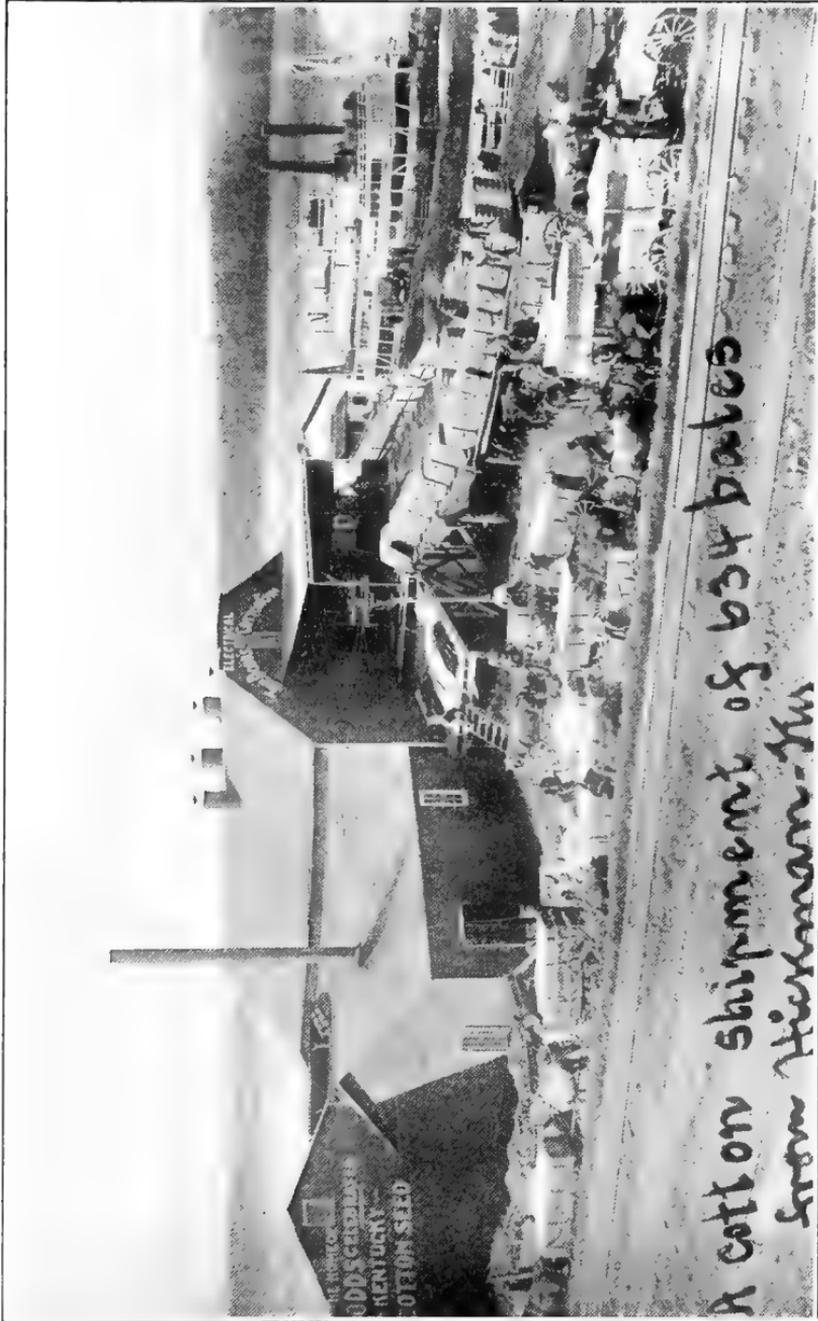
Silo erected for J. W. Shockley, Ewing, Kentucky, showing method of scaffolding.



Silo of Dr. A. G. Elliston, New Castle, Ky.



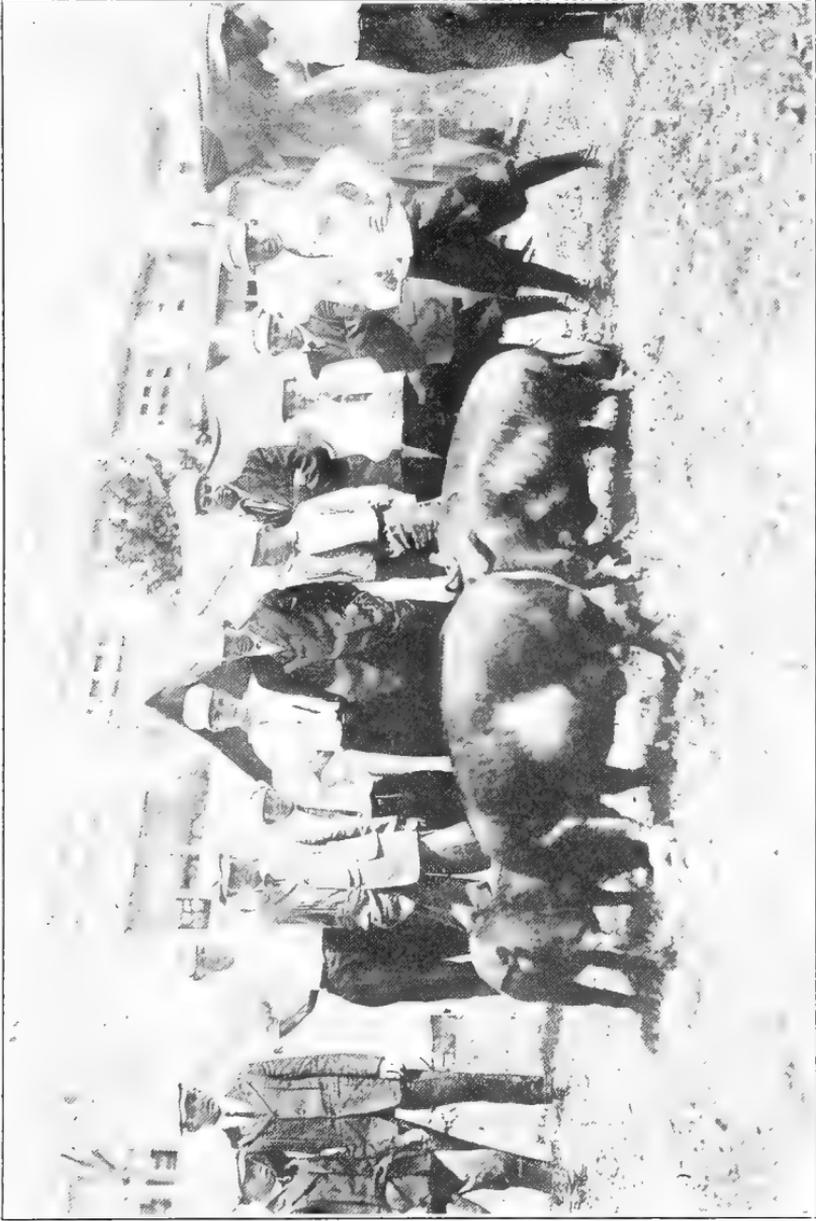
Lime Pulver.



Cotton Shipment, Hickman, Ky.



Prize Winning Apples, Kentucky State Fair.



Members Boys' Pig Clubs, at the Kentucky State Fair, Moser Bros.' feeding experiment. The Boys' pigs weighing 215 lbs., and 220 lbs., respectively, while the small pig (Dad's pig) weighed 95 lbs., as a product of "corn alone feeding." The three hogs are litter mates.—O. Kercher. (See Page 132.)



Johnnie Clinton Woodward, Wilmore, Ky., F. R. No. 2, and his seven-months-old Hampshire, weighing 330 lbs. This hog won a trip to the Kentucky State Fair for Johnnie.
(See Page 132.)

OFFICERS STATE FARMERS' INSTITUTE—1915.

Starling L. Marshall, Henderson, Ky.....	President
G. N. McGrew, Bayou, Ky.....	1st Vice-Pres.
H. C. Rice, Fredonia, Ky.....	2nd Vice-Pres.
H. G. Asbury, Augusta, Ky.....	3rd Vice-Pres.
Mrs. Christy Park, Frankfort, Ky.....	Secretary

COUNTY INSTITUTES 1914-1915.

- Adair County—J. A. English, Columbia, President; Mrs. Robert Price, Columbia, Secretary.
- Allen County—S. J. Read, Scottsville, President; D. W. Cliburn, Scottsville, Secretary.
- Anderson County—J. R. York, Lawrenceburg, R. F. D. No. 1, President; J. B. Morris, R. F. D. No. 1, Lawrenceburg, Secretary.
- Ballard County—H. L. Nance, LaCenter, President; J. B. Lawrence, Barlow, Secretary.
- Barren County—E. P. Chamberlin, Glasgow, R. No. 7, President; M. Y. Chamberlin, Glasgow, R. No. 7, Secretary.
- Boyd County—Alex. Johnson, Cannonsburg, President; J. M. York, Catlettsburg, Secretary.
- Caldwell County—Arthur Hollingsworth, Princeton, President; L. B. Sims, Princeton, Secretary.
- Calloway County—R. E. Clayton, Murray, President; N. G. Wall, Murray, Secretary.
- Carlisle County—Claude Klapp, Arlington, R. R. No. 1, President; H. W. Clayton, Bardwell, R. No. 3, Secretary.
- Carter County—Mrs. William Lewis, Grayson, President; Miss Lula Anna Hale, Grayson, Secretary.
- Christian County—F. H. Harned, Hopkinsville, President; G. I. Crabtree, Hopkinsville, Secretary.
- Clay County—A. J. Holman, Manchester, President; T. J. Rawlings, Manchester, Secretary.
- Crittenden County—J. N. Boston, Marion, President; W. L. Terry, Marion, Secretary.
- Cumberland County—C. E. Edens, Burkesville, President; E. M. Ferguson, Burkesville, Secretary.
- Davess County—John L. Johnson, Knottsville, President; Louis E. Carrico, Philpot, R. F. D. No. 2, Secretary.
- Fleming County—J. W. Shockley, Ewing, President; Wm. H. Shockley, Ewing, Secretary.
- Floyd County—A. L. Martin, Prestonsburg, President; Edward L. Allen, Prestonsburg, Secretary.
- Fulton County—J. A. Finch, Fulton, President; M. J. Browder, Fulton, Secretary.
- Garrard County—Joe E. Robinson, Lancaster, President; Walton Moss, Lancaster, Secretary.
- Graves County—H. C. Holmes, Mayfield, R. No. 7, President; J. L. Blalock, Jr., Mayfield, Secretary.

- Green County—S. T. Gorin, Greensburg, President; W. H. Graham, Greensburg, Secretary.
- Greene County—Elwood Kinner, Greenup, President; Annie M. Davidson, Greenup, Secretary.
- Hancock County—Jno. Minnet, Hawesville, President; J. D. Kelly, Hawesville, Secretary.
- Hardin County—S. M. Willis, Vine Grove, President; David Ditto, Vine Grove, Secretary.
- Hart County—R. C. Richardson, Munfordsville, President; J. D. Craddock, Munfordsville, Secretary.
- Hickman County—W. B. Finch, Fulton, R. No. 4, President; O. Piper, Clinton, Secretary.
- Hopkins County—John G. B. Hall, Madisonville, R. No. 3, President; G. W. Whitsell, Madisonville, R. No. 3, Secretary.
- Johnson County—Milton McDowell, Manila, President; W. B. Ward, Paintsville, Secretary.
- Knox County—Wm. Tye, Barbourville, President; S. B. Ries, Barbourville, Secretary.
- Larue County—John Duncan, Buffalo, President; A. J. Wheeler, Hodgenville, Secretary.
- Larue County—J. M. Feltner, London, President; C. W. Carnn, London, Secretary.
- Lawrence County—John Vaughn, Louisa, President; John G. Burns, Louisa, Secretary.
- Lewis County—S. M. Mustard, Clarksburg, President; Jesse T. Henderson, Clarksburg, Secretary.
- Lincoln County—J. M. Pettus, Stanford, President; W. P. Grimes, Stanford, Secretary.
- Livingston County—W. E. Chipp, Bayou, President; W. E. Abell, Smithland, Secretary.
- Logan County—Hugh Dawson, Olmstead, President; W. G. Snider, Lewisburg, Secretary.
- Lyon County—W. M. Wadlington, Kuttawa, President; H. P. Glenn, Kuttawa, Secretary.
- McCracken County—G. W. Potts, Paducah, R. No. 6, President; E. Futrell, Jr., Paducah, R. No. 1, Secretary.
- McCreary County—Nora E. Alcorn, Whitley City, President; G. W. Stephens, Whitley City, Secretary.
- McLean County—G. S. Ford, Calhoun, President; Ashton Wayne, Rumsey, Secretary.
- Madison County—Robert Spence, Berea, President; Meredith Gabbard, Berea, Secretary.
- Marion County—J. W. Clarkson, Lebanon, President; A. S. O'Daniel, Lebanon, Secretary.
- Marshall County—W. M. Foust, Benton, President; J. M. Bean, Benton, Secretary.
- Mason County—W. Huffman, Germantown, President; Margaret Coughlin (Miss), Germantown, Secretary.
- Mercer County—Samuel Bailey, Burgin, President; J. C. Gentry, Harrodsburg, Secretary.
- Metcalfe County—A. J. Thompson, Edmonton, President; Jno. Ray, Edmonton, Secretary.
- Monroe County—J. E. Bryant, Fountain Run, President; V. C. Landrum, Fountain Run, Secretary.

Tompkinsville Institute.

- F. M. White, Tompkinsville, President; E. T. Stephens, Vernon, Secretary.
- Morgan County—Amos Davis, West Liberty, President; T. H. Johnston, West Liberty, Secretary.
- Muhlenberg County—A. Y. Finley, Greenville, President; James W. Oates, Greenville, Secretary.
- Nelson County—G. M. D. Stoner, Bardstown, President; J. E. Smith, Bardstown, Secretary.
- Ohio County—Henry Purtle, Beaver Dam, President; Wm. E. Travis, Beaver Dam, Secretary.
- Pulaski County—W. H. Lyons, Science Hill, President; Mrs. W. H. Lyons, Science Hill, Secretary.
- Rockcastle County—J. G. Frith, Brodhead, President; W. H. Anderson, Brodhead, Secretary.

Mt. Vernon Institute.

- W. U. Fish, Mt. Vernon, President; Mrs. G. M. Ballard, Mt. Vernon, Secretary.
- Rowan County—H. Van Antwerp, Farmers, President; Mrs. C. N. Waltz, Farmers, Secretary.
- Taylor County—J. H. Wade, Campbellsville, President; Scott Buchanan, Campbellsville, Secretary.
- Todd County—Norton Garth, Trenton, President; C. P. Ward, Trenton, Secretary.
- Trigg County—James D. Guier, Cadiz, President; G. A. Bridges, Cadiz, Secretary.
- Union County—John Sugg, Jr., Morganfield, President; R. H. Jones, Morganfield, Secretary.
- Washington County—W. A. Watees, Springfield, R. F. D. No. 2, President; R. C. Brown, Springfield, Secretary.
- Wayne County—M. D. Shearer, Monticello, President; Miss Ella Mae Bartleson, Monticello, Secretary.
- Webster County—Dr. C. Edwards, Sebree, President; T. Meinschein, Sebree, Secretary.
- Whitley County—E. F. Davis, Williamsburg, President; Miss Rhoda Siler, Williamsburg, Secretary.
- Wolfe County—A. J. Russell, Campton, President; I. M. Combs, Campton, Secretary.

CONCRETE SILO CONSTRUCTION.

The Department of Agriculture has continued its policy inaugurated in 1912 of encouraging the construction of concrete silos throughout the State. The small amount of annual appropriation for demonstration work, namely, five thousand dollars, has been divided among the various lines indicated in this volume, and it has been impossible for the department to purchase anything like the number of forms for the construction of cement silos that could have been used; nor could the force of men be added to, and two men have continued to do the work the department has undertaken. However, we have found by furnishing the forms to the County Demonstration Agents in some of the counties, practically the same results have been obtained as if they had been handled by the State. They have supervised the work in many instances, after having been instructed by one of the men employed by the department. In this way fifty or sixty concrete silos have been erected each year through assistance from this small appropriation.

There has never been reported to this department a single failure of the concrete silo to keep ensilage when our instructions of painting the interior with coal tar paint, and washing the exterior with cement, have been followed. Storms have blown down the buildings adjacent to concrete silos, fires have burned them down, yet each silo constructed under the supervision of the department still stands. In one instance, lightning struck a silo, and tore a hole through a six-inch wall near the bottom of the structure, and a little cement to fill the aperture was all that was necessary to repair the damage.

The experimental stage of the Monolithic Silo is passed. It has not been and is not the policy of the department to condemn any material for the erection of silos. Wooden silos, when properly constructed and kept tight, will keep ensilage for twelve or fifteen years equally as well as a concrete one. The cement block, the cement stave, the tile and the metal silo, each is better

than no silo at all. The question with the farmer is not so much what kind of a silo he will have, but whether he can erect one. The work of this department has in no sense decreased the number of wooden silos purchased annually in the State, but its educational campaign has, on the other hand, very materially aided in increasing the number of silos of each character erected. A regular contractor can usually keep busy an entire season erecting cement silos in any community. The farmer himself, with a little assistance, can erect his own cement structure. For permanency, economy and satisfaction we do not hesitate to recommend the Monolithic Silo to the farmers of this State. The wooden silo may be cheaper for the time being, it can be erected more hurriedly, and where durability is not a factor to be considered, may do just as well. But one out of every three wooden silos blows down, and it is necessary from time to time to tighten them, and they frequently become twisted, and very often they are not air-tight. The tile and metal silo are usually more expensive, and when all things are considered, a farmer who builds a concrete silo has a receptacle for green feed so long as he lives, or so long as he may own the farm upon which the silo is erected.

The fact that the number of silos being erected in Kentucky annually amount to about two thousand, should be sufficient proof of their value. The use of ensilage has a tendency to increase the number of live stock kept throughout the winter, because of the fact that the entire corn crop when put in the silo is saved; because ensilage is fed without any great amount of loss, even in the worst weather, and it makes the feeding of live stock less difficult. It also encourages the saving of manure, and this annual dressing of a few acres on the average farm soon convinces the farmer that it pays to feed the land.

As stated in the Twentieth Biennial Report, "The corn crop of Kentucky, that is the grain from the corn crop for 1912, is given by the Department of Agriculture at Washington as being worth in round numbers sixty millions of dollars. The chemists tell us that the feeding value of the stalks, blades, shucks, silks, tassels

and cobs of the corn plant when in the silo stage is practically the same in quality and quantity as that of the grain on the plant. Stated in a different way, the grain grown on the plant in Kentucky is sixty millions of dollars per annum, and the feeding value of the plant other than the grain is approximately sixty millions of dollars. Anyone familiar with the methods of handling the corn stalk by the farmers of this State would not undertake to say that more than fifty per cent. of the feeding value of the corn stalks in Kentucky is actually saved by the farmers. There is an annual loss, therefore, of approximately thirty millions of dollars in Kentucky through our wasteful methods of handling the corn plant after the ear is taken therefrom. Were all of these plants put into silos at the right time, practically all of this waste would be prevented, since, in filling the silo, the entire corn plant is used. Stock, especially cattle and sheep, will eat practically the entire plant in the form of good ensilage. From a saving standpoint alone, therefore, the immense value of the silo to the corn-growing farmer is self-evident, but the value of the silo does not stop here."

The fact that live stock will go through an entire winter in better shape feeding off of ensilage, encourages the live stock owner, and a greater effort is made to produce the most possible out of the animals kept. The manure is used to build up the land. Clovers do better on lands full of humus, and soon the farmer has learned a great lesson in soil-building. The silo has done much toward turning farmers to constructive farming. Kentucky has made great strides along the lines of progressive agriculture in the last few years, and nothing the department has done has paid better than its work in silo construction. It now owns about fifteen forms, varying from twelve to eighteen feet in diameter. These forms cost from seventy-five to ninety dollars each, with the exception of one fourteen-foot steel form, which cost about \$650. Two men have been kept in the field during the summer months for the last four seasons. The salary of the representative of the department, his transportation and incidental expenses are paid by the State.

From one to three silos are built in each community that it was possible to reach. Many requests have been received that it was impossible to fill. These forms have been used for demonstration purposes; that is, it has not been the policy of the department to build the silos for the farmer, but to show each community how readily a concrete silo could be constructed, and to let him see its value upon the farm. As a result the increased number of these structures throughout the State means a paying investment of several hundred thousand dollars.

The cost has varied very materially. Freight rates, the convenience of sand and gravel, the ability of the farmer to get the most out of his labor, the weather and so on have resulted in quite a difference of cost, even in the same size structure. In order that the farmer may have an idea what a silo would cost him, we are attaching hereto the actual cost of several silos constructed under the supervision of this department:

ESTIMATED COST OF SILO CONSTRUCTION.

Name	Address	Size Silo	Cost of Cement	Cost of Gravel or Rock	Cost of Sand	Cost of Reinforcing	Cost Labor	Miscellaneous Costs	Total Cost of Silo
Wm. L. Mosby	Bardwell	14x37	\$105.00	\$ 15.00	\$ 15.00	\$ 34.60	.....	\$281.00	\$450.00
C. S. Curd	Greenville	12x36	.....	.....	.....	.....	.....	.....	347.50
Tandy Giles	Grayson	14x40	90.00	49.00	20.00	20.00	.....	221.00	400.00
J. N. Fergy	Owensboro	14x43	71.70	.....	79.90	24.00	.....	200.00	375.80
A. G. Elliston	New Castle	14x45	112.50	100.00	40.00	24.00	\$75.00	50.00	401.50
Harris Bros.	Brassfield	14x45	100.00	40.00	32.00	25.00	.....	113.00	310.00
Merriwether & Merriwether	Trenton	16x45	130.00	.....	30.00	30.00	160.00	80.00	430.00
Wood Buchanan	Hatcher	12x30	58.50	.....	.....	5.00	.....	112.00	175.50
Jno T. Wells	Maysville	12x30	38.75	38.00	10.00	18.00	.....	50.00	154.75
J. D. Flynn	Bronston	14x40	96.70	18.00	5.50	20.00	.....	110.00	239.20
Jas. B. Gover	Bronston	14x37-8"	80.75	27.90	6.00	22.40	.....	98.00	235.90
Chipp Bros.	Bayou	16x32	82.50	30.00	.....	22.50	59.70	47.25	241.95

CEMENT, SAND AND STONE REQUIRED FOR WALLS OF SILOS.

Thickness of walls, 6 inches. Doors, 26 inches wide. Proportions for concrete, 1:2½:4.

Height of Silo ft.	Bbls. of Cement Required for given inside diameter in ft.					Cu. Yds. of Sand Required for given inside diameter in ft.					Cu. Yds. of Gravel Required for given inside diameter in ft.							
	10	12	14	16	18	20	10	12	14	16	18	20	10	12	14	16	18	20
20	16.0	19.0	22.6	25.4	32.0	.....	5.8	7.0	8.4	9.3	.....	.....	9.4	11.2	13.3	15.2	.....	.....
22	17.7	21.0	24.9	28.0	32.0	.....	6.5	7.7	9.0	10.2	11.6	.....	10.4	12.4	14.8	16.5	18.8	.....
24	19.2	22.8	27.1	30.7	35.0	38.5	7.0	8.6	9.9	11.2	12.7	14.1	11.4	13.5	16.0	18.2	20.6	22.8
26	21.0	24.8	29.3	33.0	37.8	41.8	7.7	9.1	10.7	12.1	13.7	15.3	12.4	14.7	17.4	19.6	22.2	24.8
28	22.3	26.6	31.5	35.5	40.6	44.9	8.2	9.7	11.6	13.0	14.8	16.4	13.3	15.8	18.7	21.0	24.0	26.5
30	24.0	28.8	33.8	38.2	43.4	48.0	8.7	10.5	12.3	14.0	15.8	17.5	14.2	17.0	19.8	22.8	25.5	28.5
32	25.7	30.7	36.0	40.5	46.0	51.4	9.4	11.2	13.1	14.8	16.9	18.7	15.0	18.0	21.3	24.0	27.3	30.3
34	27.1	32.3	38.3	43.4	49.0	54.3	10.0	11.8	14.0	15.8	17.9	19.9	16.1	19.2	22.5	25.5	29.0	32.0
36	28.7	34.2	40.4	45.8	52.0	57.5	10.5	12.5	14.8	16.8	19.0	21.0	17.0	20.3	24.0	27.2	30.6	34.0
38	30.3	36.2	42.8	48.7	55.0	60.8	11.1	13.3	15.7	17.8	20.1	22.2	18.0	21.5	25.4	28.7	32.5	35.9
40	31.7	37.8	44.5	50.6	57.5	64.0	11.6	14.0	16.4	18.6	21.2	23.6	18.8	22.4	26.4	30.0	34.0	38.0
42	33.5	40.0	47.4	53.7	60.5	67.5	12.3	14.7	17.3	19.5	22.1	24.6	19.9	23.8	28.0	31.7	35.6	40.0
44	.....	41.8	49.6	55.8	65.3	71.0	.....	15.3	18.1	20.4	23.9	26.0	.....	24.8	29.2	33.0	38.4	41.8
46	.....	.....	51.8	58.6	66.5	74.0	.....	.....	18.9	21.4	24.4	27.0	.....	.....	30.6	34.7	39.3	43.5
48	.....	.....	.....	61.2	69.8	76.6	.....	.....	.....	22.3	25.5	28.0	.....	.....	.....	36.0	41.0	45.0
50	.....	.....	.....	.....	71.6	80.0	.....	.....	.....	.....	26.3	29.6	.....	.....	.....	.....	42.3	47.2

Material for foundation or bottom not included.

CAPACITY OF SILOS IN TONS.

Inside Height of Silo	Inside Diameter of Silo					
	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
20 ft.	26	38	51	67		
21 ft.	28	41	55	72		
22 ft.	30	43	59	77		
23 ft.	32	46	63	81	103	
24 ft.	34	49	67	86	110	
25 ft.	36	52	71	91	116	143
26 ft.	38	55	75	97	123	152
27 ft.	40	58	79	102	130	160
28 ft.	42	61	83	109	137	169
29 ft.	44	64	87	114	144	178
30 ft.	47	67	91	119	151	187
31 ft.	49	70	96	125	158	196
32 ft.	51	74	100	131	166	205
33 ft.	53	77	105	137	174	215
34 ft.	56	80	109	143	181	224
35 ft.	58	84	114	149	189	234
36 ft.	61	87	118	155	196	243
37 ft.	63	90	123	161	204	252
38 ft.	66	94	128	167	212	262
39 ft.	68	97	133	173	220	272
40 ft.	70	101	138	180	228	282
41 ft.	72	105	143	187	236	291
42 ft.	74	109	148	193	244	300
43 ft.	....	113	154	201	252	310
44 ft.	....	117	159	207	261	320
45 ft.	....	.....	165	215	269	330
46 ft.	....	.....	170	222	277	340
47 ft.	....	.....	.....	229	285	350
48 ft.	....	.....	.....	236	293	361
49 ft.	....	.....	.....	.....	301	371
50 ft.	....	.....	.....	.....	310	382

GROUND LIMESTONE DEMONSTRATIONS.

Out of the funds for the fiscal year ending June 30, 1914, the Department of Agriculture saved sufficient to purchase two lime pulvers. By the time they were secured and started, the season was late and only a limited number of demonstrations were given. These were started again in May, 1915, and ran until November. The bad weather and short working days made it impracticable to run this machine during the winter months. Each machine has been able to make about fifty farmers during the season, and it has been the policy of this Department to grind not exceeding fifty tons of limestone for one farmer. The farmer furnishes the engine, the material and the labor and boards the man in charge of the machine, while the Department has furnished the machine and the per diem of the man in charge. As a result of this work, the value of ground limestone in sweetening the sour soils of the State is gradually being impressed upon the land owners. Farmers adjoining railroads can secure as a usual thing limestone at a reasonable price from rock crushers operated by private parties. It is the farmer, who lives several miles from any station, who finds it impractical to buy ground limestone and haul it to his farm. Experience shows that it costs about 25c per ton per mile to move this material. If the farmer has to haul this exceeding six miles it runs the total cost in the neighborhood of \$3.00 per ton. The machines owned by this Department have demonstrated to the farmers and to various communities through the co-operative ownership of one of these machines that ground limestone can be had at a cost of from 50c to \$1.00 per ton on the farm. The value of this material as a soil corrective has been demonstrated beyond the shadow of a doubt. Leguminous crops, such as alfalfa, clover, cowpeas and soy beans, that have been failures heretofore, flourish on soil covered with four or five tons per acre of this ground limestone. Some idea of the popularity and value of this work may be gathered from the fact that four years ago there were about seven places in Kentucky where ground limestone could be se-

cured. Today there are in the neighborhood of 75 large mills producing ground limestone and some 50 small machines are owned either individually or co-operatively within the State. Convicts in some of the states are being used in operating quarries and machines to turn out ground limestone for the farmers. Under the amendment recently passed providing convicts may work outside the penitentiary walls makes it possible for Kentucky to use some of her convicts for a similar purpose. A sufficient demand from the farmers for this material may possibly lead to some legislation along this line in Kentucky. It has been utterly impossible for this Department with two machines to reach more than one-tenth of the farmers asking for their use. It is a well-known fact that Kentucky has an unlimited supply of carbonate of lime. It needs only to be pulverized to sweeten the land, that now will not produce leguminous crops as a result of acidity. Here is the basis of soil improvement, and the sooner the farmers learn this fundamental truth, the quicker will be our beginning of real agricultural growth.

CO-OPERATIVE ORCHARDS.

During the past two years, a Co-operative Orchard Association has been organized in Lewis county, with a membership of approximately four hundred and thirty, owning one thousand four hundred and seventy-six acres. To plant these orchards it required seventy-three thousand eight hundred trees. These trees were of the following varieties:

Stayman Winesap, 15,000; York Imperial, 15,000; Rome Beauty, 15,000; Jonathan, 15,000; Grimes Golden, 7,500, and Yellow Transparent, 7,500.

These trees were bought as whole root grafts and planted in the spring of 1915. The illustrations accompanying this article show the growth of these trees in one season, which in some instances has exceeded six feet.

Other orchards would have been established, but the fight against foot-and-mouth disease necessitated the use of the funds the Department had intended to devote to the development of additional work along these lines.

The orchards planted in 1913 in the counties of Rowan and Hardin, are making a splendid growth. These three Co-operative Orchard Associations are organized in counties where the lands are adapted to fruit growing. As stated in the Twentieth Biennial Report, the Department has only furnished trees where a sufficient number of farmers were organized to plant at least one thousand acres. Every indication is that what is most needed in Kentucky along horticultural lines is a system of co-operative marketing. Kentucky ranks seventh as an apple-producing State among the states of the nation; yet the fact remains that the apple growers do not obtain anything like the prices they should get for their product. This is the result of so many varieties, and a lack of co-operation. Not more than six varieties of winter apples have been furnished to any one of the demonstration orchards as organized by this Department, and the only requirement the Department has made is that the members form an Association with the proper officers, and all surplus fruit be sold through the General Manager.

Mr. R. E. Settle, Manager of the Hardin County Fruit Growers' Association, writes as follows:

“Our young orchards, planted here as a result of the co-operation of the Agricultural Department of the State, have made splendid growth this season, and are going into the winter in good shape. From what information I can gather, about seventy-five per cent. of the members of the Fruit Growers' Association who put out the apple trees furnished by the State, have taken fairly good care of their orchards. I have tried to give mine first-class attention, and they have responded well to the attention given them, as shown in the picture sent you. They were trimmed closely last spring, yet, you will notice, they are higher than a man's head. I have some of the Stayman Winesaps in another part of the orchard that have made phenomenal growth. We are planning

now to scatter next spring a few forks of manure around each tree after they have been mulched with the hoe. What we want next year, the year after they should begin to bear some fruit, is wood growth so as to get the proper bearing capacity, and we are going to force them next year.

“We have a cold storage plant here that is buying up all the apples in the immediate vicinity, and this should be quite an encouragement to the apple growers, as these people will buy the apples right in the orchard, either on the trees or picked and put to the table. This makes it possible for a larger orchard to be handled with less farm labor. They do the barrelling themselves, and haul the apples in on large motor trucks 40 barrels at a load.”

Mr. H. Van Antwerp, of the Rowan County Association, writes as follows:

“We had no peach crop this year, and the apples are a little too young to bear yet, but the Experiment Station people say we have the finest little orchard in the business.

“We now have forty acres, sixteen of which were set last spring. One of the pictures shows a portion of the more recent setting. The left hand portion of this picture includes some of the apple trees furnished by the State through your courtesy.

“We do not know that anything much is being done out in the county, but articles in the county papers, and the demonstration we are making here will accomplish a little towards keeping up the interest, and, in time, something will be gained. Nothing is so good as demonstration, and it takes time for these new things to ‘percolate.’”

COMMUNITY POULTRY BREEDING

Out of the demonstration fund provided for this Department, it was deemed wise to show the advantages to a community by the proper organization of that community into a Poultry Association, with all members of the Association breeding the same varieties of poultry.

The farmers of Science Hill, Pulaski county, have shown a great interest in undertaking this experiment. Twenty-five farmers joined the organization, and the Department furnished them a trio each of Plymouth Rock chickens, and from this foundation stock they will undertake to build up a community interest in poultry breeding. They adopted rules and regulations, and will produce a uniform product, and standardize the egg and poultry shipments from that community. The result of this undertaking will demonstrate the advisability of future work along this line.

INSPECTION OF IMPORTED NURSERY STOCK.

The following report of Professor H. Garman, State Entomologist, shows the necessity of someone in this State inspecting the packages of nursery stock imported from the various foreign countries into Kentucky, before they are sent out with the possibility of spreading plant disease.

Under the general provisions of the act creating the Department of Agriculture, Labor & Statistics, we have taken from the funds of this Department and paid the expenses of the State Entomologist for the years 1914 and 1915, which have amounted to four hundred and seventeen dollars and eleven cents. The act providing for a State Entomologist, does not contemplate that he should do this work, but requires the inspection of local nurseries. Professor Garman has rendered his services free of charge, while this Department has paid his actual traveling expenses. It was only by this co-operative arrangement that foreign nursery stock was permitted to come to Kentucky at all, the Federal Department of Agriculture, under national law, having the power to prevent the importation of such packages unless properly inspected at destination. A quarantine order was ready to be promulgated against Kentucky because of a lack of provision for such inspection. The General Assembly of Kentucky should make proper provision for this work, and after a study of this report the public no doubt will see the necessity for legislative action in this connection.

NURSERY STOCK INSPECTION.

In compliance with your request, I have to report as follows on inspections of imported nursery and florists' stock, made in co-operation with the State Department of Agriculture, and with the Federal Horticultural Board, by this Department of the Kentucky Experiment Station, during the past two years, beginning July 7, 1914. The inspections were undertaken at the request of the Federal Board, which is acting under a Federal law requiring State inspections, but leaving the work to State Inspectors whenever the states provide for them. In our own case, there was no special law providing for such inspections, though they are very important as a means of preventing the shipment to Kentucky of diseased and insect-infested stock; and it was only possible to carry out the provisions of the Federal law by making an arrangement with your Department whereby the actual expenses of inspection were furnished by the Department of Agriculture, the inspections being made by assistants employed in this Department of the Station. During the year 1914, beginning July 7, as stated, we inspected 107 shipments of imported stock, in 380 cases containing 179,925 plants, at an expense of \$191.04. Most of these shipments came from Germany, Holland, Belgium and France, and were, in many cases, in bad condition, owing to careless packing, and also to carelessness on the part of foreign inspectors. The law had but recently been enacted, and foreign shippers who had not yet learned of its enactment, did not feel the need of special care in excluding diseased plants. Some of the eastern inspectors found a number of shipments infested with such pests as brown-tail moth and gypsy moth, already established in some of the Atlantic States. We have not found any Kentucky consignments infested with pests as objectionable as these, but in a number of cases plants have been found to bear scale insects and other pests which might, if overlooked, have spread, to the injury of people buying the plants. The inspections have had a decided effect in improving the quality of stock received from abroad, and our inspections this year show that we are now getting better florists' and nursery stock from such foreign countries as still ship to us, these being

Holland, France, and occasionally Belgium, than we have ever received before. I think the inspections should be continued, and some permanent provision made for paying the expenses. The probability is that the work of inspection will continue to grow, and that the assistance now available will not be sufficient to do the work as promptly and carefully as is desirable. During the past two months we have had frequent calls from florists for inspection, sometimes several requesting an inspection at the same time. With only one man available for this work, it is sometimes difficult to accommodate everyone as promptly as we could wish. On this account it seems to me desirable that some amendment be made to our present nursery inspection law, enacted in 1897, whereby we can do this work under a single appropriation made by the State. As you know, the present arrangement can hardly be considered as more than temporary, and I wish here to call attention to the importance of amending the State law in the hope that something can be done at the coming session of the Legislature to provide for these and other inspections of nursery stock, needed in the State. In brief, we should have both the inspections of nurseries and orchards, and those of imported stock under one law, fixing the responsibility for the work and making a sufficient appropriation in funds to carry it out properly. In other states this provision is already made, with the entomologists of Experiment Stations generally in charge, and sometimes, where the number of nurseries is large, a staff of special assistants is provided.

From time to time during 1914-1915, I have reported to you on the examinations thus far made, but I have thought it worth while to bring together below in one report, the data secured from examinations of imported stock in 1915, since it will furnish a basis for an estimate as to the amount of work required in the future, and the probable expense of doing it. I think these inspections should remain at the Station, with other inspections, such as those of fertilizers, feeds, foods and the like. The total number of inspections made in 1915 to date was 87; in January, 4; February, 4; March, 8; April, 5; May, 3; October, 18; November, 44, and December, 1, with sev-

eral others reported but not yet examined. The number of plants in these lots is approximately 208,560, of which 30,027 are florists' and 178,533 nursery stock. With the plants examined in 1914 we have examined a total of 388,485. The total expenses of inspections made during 1914 and 1915 to date are \$417.11. Details of the 1915 inspections follow:

K. D. Alexander, Spring Station, Ky.

- 2 cases. March 26/15. Boskoop, Holland.
- 1605 Rose plants.
- No infestation.

Beutel & Frederick, Louisville, Ky.

- 1 case. October 22/15. Meirelbeke, Belgium.
- 72 Azalea Indica.
- 1 case. October 21/15. Loochristy, Belgium.
- 25 Araucarias and 60 palms.
- No infestation except a few scattered soft scale on palms.
- 1 case. November 27/15. Boskoop, Holland.
- 200 Roses, 52 Shrubs, 50 Dicentra and 100 Spirea.
- Not yet inspected.

W. H. Carp, Ashland, Ky.

- 2 cases. October 21/15. St. Amand, Belgium.
- 113 Azaleas and 36 Araucarias.
- No infestation.

The Donaldson Co., Sparta, Ky.

- 14 cases. January 9/15. Angers, France.
- 9500 Fruit tree stocks.
- 50975 Ornamental deciduous shrubs.
- 6000 Rose stocks.
- 5500 Forest and ornamental seedlings.
- 2000 Pinus and mughus.
- 4500 Conifers.
- 6300 Evergreen shrubs.
- Sour cherry lightly infested with wooly species of aphids.
- Helleborus nigra badly infested with aphids.
- 6 cases. February 16/15. Boskoop, Holland.
- 600 Juniperus.
- No infestation.
- 41 cases. February /15. Boskoop, Holland.
- 1576 Conifers.
- 606 Pinus mughus.
- 1141 Buxus.
- 250 Andromeda.
- 446 Azaleas.
- 200 Rhododendrons.
- 800 H. P. Roses.
- 650 Climbing Plants.
- 210 Evergreen shrubs.
- 150 Malus.
- 15 Trained fruit trees.
- 50 Magnolias.
- 70 Acer.

Buxus—Large number of plants lightly infested with oyster-shell scale.

Juniperus communis—Light infestation of aphidae.

English holly—Light infestation of leaf miner and leaf spot.

Malus and train fruit trees—Crown gall.

3 cases. March 26/15. Boskoop, Holland.

175 Conifers.

500 Hydrangeas.

25 Azaleas.

12 Rhododendrons.

No infestation.

3 cases. March 27/15. Angers, France.

13500 Fruit tree stocks.

11325 Ornamental deciduous shrubs.

2500 Conifers.

675 Ornamental evergreen shrubs.

No infestation.

Unreported shipment. March /15. Boskoop, Holland.

1000 Boxwood.

500 Roses.

400 Juniperus.

100 Rhododendrons.

No infestation.

3 cases. November 3/15. Boskoop, Holland.

1350 Peonies.

516 Dicentra.

No infestation.

7 cases. November 4/15. Boskoop, Holland.

1000 Hydrangea.

100 Dutchman's Pipe.

150 Azaleas.

50 Aesculus.

2000 Viburnum.

1000 Weigelia.

No infestation.

C. P. Dietrich & Bro., Maysville, Ky.

1 case. November 4/15. Ghent, Belgium.

50 Azaleas.

No infestation.

H. Fuchs, Louisville, Ky.

5 cases. January /15. Boskoop, Holland.

1510 Roses.

36 Azaleas.

12 Magnolias.

12 Malus.

12 Rhododendrons.

75 Clematis.

No infestation.

3 cases. November 4/15. Loochristy, Belgium.

224 Azaleas.

No infestation.

4 cases. November 27/15. Boskoop, Holland.

25 Abies.

50 Lilacs.

12 Maples.

400 Roses,

50 Evergreens.
 50 Rhododendrons.
 50 Hydrangeas.
 Not yet inspected.

Edward H. Fries, Fort Thomas, Ky.

4 cases. May 21/15. Melle, Belgium.
 200 Araucarias.
 100 Aspididtras.
 No infestation.
 2 cases. October 21/15. Melle, Belgium.
 200 Azaleas.
 No infestation.

Henry Goekel, Fort Thomas, Ky.

2 cases. November 4/15. Melle, Belgium.
 124 Azaleas.
 Lightly infested with "white fly sp."
 1 case. November 7/15. Melle, Belgium.
 100 Azaleas.
 No infestation.

S. M. Harbison, Danville, Ky.

1 case. November 5/15. Melle, Belgium.
 57 Azaleas.
 25 Araucarias.
 No infestation.

H. F. Hillenmeyer & Sons, Lexington, Ky.

6 cases. February 16/15. Angers, France.
 5175 Ornamental deciduous shrubs.
 3500 Ornamental seedlings.
 9450 Conifers.
 200 Ornamental evergreen shrubs.
 1600 Austrian pines.
 No infestation.
 4 cases. January 12/15. Angers, France.
 15500 Fruit tree stocks.
 14200 Ornamental deciduous shrubs.
 1200 Ornamental evergreen shrubs.
 775 Forest and ornamental seedlings.
 No infestation.
 1 case. February 24/15. Angers, France.
 Ornamental shrubs.
 Evergreen seedlings.
 Mahonia.
 Abies.
 Cotoneaster.
 Honeysuckle.
 No infestation.

Honaker Bros., Lexington, Ky.

3 cases. October 20/15. Loochristy, Belgium.
 175 Azaleas.
 75 Azaleas.
 No infestation.

John A. Keller Co., Lexington, Ky.

- 2 cases. October 20/15. Loochristy, Belgium.
125 Azaleas.
No infestation.
- 1 case. November 7/15. Boskoop, Holland.
170 Deciduous shrubs.
No infestation.
- 2 cases. November 5/15. Boskoop, Holland.
75 Evergreen shrubs.
No infestation.
- 1 case. November 3/15. Ghent, Belgium.
100 Azalea Indica.
No infestation.

H. Kleinstarink, Louisville, Ky.

- 2 cases. November 8/15. Boskoop, Holland.
209 Hydrangeas.
50 Weigelias.
100 Hotteia Jap.
100 Buxus Semp.
No infestation.
- 3 cases. November 20/15. Boskoop, Holland.
25 Coniferous Trees.
50 Roses.
60 Evergreen shrubs.
75 Deciduous shrubs.
No infestation.

C. H. Kunzman, Louisville, Ky.

- 1 case. November 5/15. Ghent, Belgium.
86 Azaleas.
No infestation.
- 2 cases. November 20/15. Boskoop, Holland.
100 Roses.
85 Deciduous shrubs.
37 Evergreen shrubs.
No infestation except on Buxus, very light infestation of oyster shell scale.

J. F. Link, Louisville, Ky.

- 1 case. November 5/15. Melle, Belgium.
25 Araucaruas.
25 Azaleas.
20 Palms.
No infestation.

Michler Bros. Co., Lexington, Ky.

- 9 cases. February 18/15. Boskoop, Holland.
17 Juniperus.
38 Cupressus.
5 Thuya.
6 Abies.
98 Reh.
5 Blue spruces.
15 Picea.
2 Buxus.
5 Pinus mughus.
20 Taxus.
Buxus slightly infested with oyster shell scale.

- 2 cases. March 10/15. Boskoop, Holland.
297 Buxus.
No infestation.
- 1 case. November 3/15. Ghent, Belgium.
85 Azaleas.
No infestation.
- 2 cases. November 5/15.
155 Vines.
5 Magnolias.
50 Dicentia.
20 Azaleas.
55 Hydrangeas.
20 Lilacs.
5 Mahonia.
No infestation.
- 1 case. November 8/15. Boskoop, Holland.
325 Roses.
30 Evergreen shrubs.
4 Evergreen trees.
No infestation.
- 1 case. November 17/15. Boskoop, Holland.
474 Roses.
Not yet inspected.

Joseph E. Merritt, Louisville, Ky.

- 3 cases. November 4/15. Boskoop, Holland.
100 Evergreens, assorted.
40 Roses, in var.
6 Azaleas.
12 Lilacs, in var.
12 Rhodos, in var.
5 Japan maples, red.
50 Box bushes.
7 Japan maples.
12 Pyramid boxwood.
No infestation.

W. H. Leeming, Shively, Ky.

- 3 cases. April 12/15. Boskoop, Holland. -
150 Evergreens.
No infestation.
- 5 cases. April 17/15. Boskoop, Holland.
102 Boxwood.
31 Picea.
10 Evonymus.
20 Juniperus.
5 Laurus.
10 Acer.
Several plants of boxwood badly infested with oyster shell scale.

G. R. Noble, Florist, Paducah, Ky.

- 2 cases. October 21/15. Ghent, Belgium.
100 Azaleas.
No infestation.

New Nanz & Neuner, Louisville, Ky.

- 2 cases. October 21/15. Loochristy, Belgium.
 150 Azaleas.
 50 Araucarias.
 No infestation.
- 4 cases. November 4/15. Boskoop, Holland.
 232 Buxus.
 No infestation.
- 2 cases. November 4/15. Boskoop, Holland.
 6 Hollies, berried.
 12 Rhodos. pink pearl.
 4 Rhodos. assorted.
 8 Rhodos. assorted.
 25 Abies nord.
 12 Aucuba.

Chas. Pfeiffer's Sons, Fort Thomas, Ky.

- 1 case. May 17/15. Ghent, Belgium.
 30 Kentia.
 37 Araucaria.
 Kentia lightly infested with "aspidiotus hederæ."
 Araucaria free from infestation.
- 1 case. October 25/15. Meirelbeke, Belgium.
 100 Azalea indica.
 No infestation.

L. Pfeiffer & Sons, Newport, Ky.

- 4 cases. October 25/15. Meirelbeke, Belgium.
 300 Azalea indica.
 No infestation.

Popp Bros., Covington, Ky.

- 1 case. October 20/15. Meirelbeke, Belgium.
 100 Azaleas.
 No infestation.
- 2 cases. November 3/15. Ghent, Belgium.
 200 Azalea indica.
 No infestation.
- 1 case. November 7/15. Mt. St. Amand, Belgium.
 105 Azalea indica.
 No infestation.

S. Pontrich, Louisville, Ky.

- 1 case. November 11/15. Ghent, Belgium.
 75 Azaleas.
 No infestation.

Mrs. Edmund Power, Frankfort, Ky.

- 1 case. November 10/15. Destelbergen, Belgium.
 24 Azaleas.
 No infestation.

E. G. Reimers & Son Co., Louisville, Ky.

- 1 case. October 21/15. Ghent, Belgium.
 105 Azaleas.
 Found to be slightly infested with fungus *Exobasidium*, sp.

Geo. Schultz, Louisville, Ky.

- 2 cases. March 11/15. Boskoop, Holland.
 56 Evergreen shrubs.
 100 Field grown florist stock.
 95 Deciduous shrubs.
 25 Coniferous trees.
 Box bushes with light infestation of oyster shell scale.
 Stock unpacked and part of it sent away before being inspected.
- 2 cases. January 22/15. Lubeck, Germany.
 100 Dormant lilac plants.
 No infestation.
- 2 cases. April 12/15. Boskoop, Holland.
 220 Evergreens.
 Importer's notice received, but Mr. Schultz failed to notify this Department of arrival of stock, which was unpacked and sold without being inspected.
- 5 cases. November 4/15. Mt. St. Amand, Belgium.
 318 Azaleas.
 No infestation.
- 1 case. November 10/15. Ghent, Belgium.
 145 Azaleas.
- 1 case. November 8/15. Aalsmer, Holland.
 60 Lilac plants.
- 1 case. November 29/15. Boskoop, Holland.
 41 Rhododendrons.
 12 Kalmias.
 12 Azaleas.
 Not yet inspected.
- 1 case. November 30/15. Boskoop, Holland.
 6 Azaleas.
 24 Rhododendrons.
 75 Roses.
 50 Hydrangeas.
 Not yet inspected.

Schmaus Bros., Paducah, Ky.

- 3 cases. October 22/15. Melle, Belgium.
 125 Azalea indica.
 50 Coniferous trees.
 100 Aspidistra.
 No infestation.
- 1 case. October 21/15. Ghent, Belgium.
 100 Azaleas.
 No infestation.
- 3 cases. November 7/15. Boskoop, Holland.
 150 Roses.
 200 Deciduous shrubs.
 50 Field grown florist stock.
 No infestation.
- 1 case. November 5/15. Evergem, Belgium.
 125 Azaleas.
 No infestation.
- 1 case. December 1/15. Ghent, Belgium.
 100 Azaleas.

Schumann & Wahlers, Newport, Ky.

- 3 cases. October 20/15. Loochristy, Belgium.
 280 Azaleas.
 No infestation.

Will Schumann, Newport, Ky.

- 5 cases. November 10/15. Ghent, Belgium.
 215 Azaleas.
 155 Evergreen shrubs.
 No infestation.

John Van Aart, Paducah, Ky.

- 1 case. October 21/15. Ghent, Belgium.
 100 Azaleas.
 No infestation.
- 2 cases.
 137 Deciduous shrubs.
 162 Roses.
 No infestation.

F. Walker Co., Louisville, Ky.

- 4 cases. April 5/15. Boskoop, Holland.
 104 Vines.
 90 Evergreens.
 12 Magnolias.
 100 Hydrangeas.
 50 Roses.
 No infestation.
- 2 cases. April 12/15. Boskoop, Holland.
 500 Maples.
 100 Magnolias.
 10 Polygonum.
 100 Lilacs.
 100 Viburnums.
 Norway maples badly infested with aphids. Inspection certificate absent from case containing infested plants.
- 2 cases. October 11/15. Melle, Belgium.
 116 Azaleas.
 No infestation.
- 1 case. November 4/15. Loochristy, Belgium.
 100 Azaleas.
 No infestation.
- 2 cases. November 9/15. Boskoop, Holland.
 2 Wisteria.
 52 Rhododendrons.
 12 Magnolias.
 6 Buxus pyramids.
 10 Aucubas.
 25 Lilacs.
 25 Clematis.
 25 Deutzias.
 45 Roses.
 No infestation.
- 2 cases. November /15. Boskoop, Holland.
 50 Azaleas.
 100 Deciduous shrubs.
 10 Evergreen shrubs.
 12 Retinospora.
 Importer's notice not received. Azaleas badly damaged in transit. No infestation.

Miss Fannie White, Lexington, Ky.

- 1 case. May 21/15. Melle, Belgium.
 - 12 Areca.
 - 6 Palms.
- 1 case. November 5/15. Ghent, Belgium.
 - 60 Azaleas.
 - No infestation.

Wm. Walker, Louisville, Ky.

- 275 Azaleas.
- 3 cases. October 20/15. Loochristy, Belgium.
- 2 cases. November 4/15. Boskoop, Holland.
 - 2 Hollies, berried in tub.
 - 48 Rhododendrons, assorted.
 - 4 Abies nord.
 - 100 Spirea.
 - 12 Aucuba.
 - 21 Abies Nord.
 - No infestation.

Wood, Stubbs & Co., Louisville, Ky.

- 2 cases. March 10/15. Boskoop, Holland.
 - 50 Magnolias.
 - 100 Frankia.
 - 50 Tacoma.
 - Stock unpacked and part sent away before being inspected. No infestation.
- 3 cases. May 17/15. Angers, France.
 - 5950 Ornamental evergreen shrubs.
 - 5300 Ornamental deciduous shrubs.
 - Stock unpacked and part of it sent away before being inspected. No infestation.
- 8 cases. December /15. Boskoop, Holland.
 - Shrubs and hardy perennials.
 - Not yet inspected. Importer's notice not received.

Morgan Floral Co., Henderson, Ky.

- 1 case. November 20/15. Boskoop, Holland.
 - 2 Forest and deciduous trees.
 - 10 Evergreen shrubs.
 - 119 Deciduous shrubs.
 - Not yet inspected.

The Walther Co., Louisville, Ky.

- 2 cases. November 5/15. Boskoop, Holland.
 - 50 Azaleas.
 - 100 Deciduous shrubs.
 - 10 Evergreen shrubs.
 - 12 Retinospora.
 - Not yet inspected.

F. L. Metcalfe, Hopkinsville, Ky.

- 2 cases. November 18/15. Evergem, Belgium.
 - 172 Azaelas.
 - Not yet inspected.

Morgan Floral Co., Henderson, Ky.

1 case. FJG 306. December 8/15.

Forest and deciduous trees.

Evergreen shrubs.

Deciduous shrubs.

Importer's notice received. Inspection made by H. R. Niswonger, and found free from infestation.

F. L. Metcalfe, Hopkinsville, Ky.

2 cases. G. S. 130/131. December 9/15.

Azalea indica.

Importer's notice received. Inspected by H. R. Niswonger, and found free from infestation.

Jacob Schultz, Louisville, Ky.

1 case. O. H. 253. December 10/15.

Rhododendrons.

Kalmias.

Azaleas.

Importer's notice received. Inspected by H. R. Niswonger and found free from infestation.

1 case. O. H. 254.

Azaleas.

Rhododendrons.

Roses.

Hydrangeas.

Importer's notice received. No infestation.

Beutel & Frederick, Louisville, Ky.

1 case. H. K. 241. December 10/15.

Roses.

Shrubs dicentia and spirea.

Importer's notice received. Inspected by H. R. Niswonger and found free from infestation.

Michler Bros., Lexington, Ky.

1 case. Hortus 285. December 11/15.

Roses.

Importer's notice received. Inspected by Erle C. Vaughn, and found free from infestation.

Henry Fuchs, Louisville, Ky.

4 cases. H. K. 224/227. December 7/1915.

Abies.

Lilacs.

Maples.

Roses.

Evergreens.

Rhododendrons.

Hydrangeas.

Importer's notice received. Inspected by H. R. Niswonger, and rhododendrons found to be lightly infested with leaf spot fungus.

F. Walker Co., Louisville, Ky.

2 cases. G. P. 227/8. November 16/15.

Azaleas.

Deciduous shrubs.

Evergreen shrubs.

Retinospora.

Importer's notice received. Inspected by H. H. Jewett, and found free from infestation. Azaleas badly damaged in transit.

Wood, Stubbs & Co., Louisville, Ky.

8 cases. F. J. G. 392/6, 524, 624 and 624a. December 6-10/15.

Deciduous shrubs.

Roses.

Root stocks of perennials.

Importer's notice not received. Inspected by H. R. Niswonger, and *Pyrus* sp. found to be lightly infested with *Aphis* sp., egg stage. Inspection certificate torn from case.

H. GARMAN,
State Entomologist.

INSPECTION OF NURSERY STOCK

Lexington, Ky., Dec. 27, 1915.

Dear Sir:

I am giving below the names of the nurseries inspected under the State law during the past year, and have marked with a single star those infested with San Jose Scale, where all the requirements of the inspector have been complied with, infested stock being destroyed and the rest fumigated before being put on the market. I believe these nurseries have done all that can reasonably be required of them, and I have issued certificates accordingly.

Those nurseries marked with two stars were infested with San Jose scale, but have not yet received certificates.

The total amount of stock inspected this year was: Trees, 2,083,135; other stock, 8,054,550.

Those nurseries marked with three stars did not have San Jose scale, but failed to receive certificates on account of other infested stock.

Yours very truly,

H. GARMAN,
State Entomologist.

KENTUCKY NURSERIES AND ORCHARDS INSPECTED IN 1915.

Adams, J. B.....	Waco
*Aebersold, Chris.....	Rock Haven
*Ashby, W. S. & Sons.....	Cloverport
Barton, J. E., State Forester.....	Frankfort
Beall, Alvin.....	Mt. Sterling, R. R. No. 3
*Beyer, H. E.....	Paducah
Blankenbeker, L. H.....	Jeffersonton
Bridges Bros.....	Cadiz
Burnett, F. M.....	Oakland
Clark, Joe.....	Paynesville
*Clark, W. W. & Co.....	Sharpsburg
Childres, Jas.....	Auburn
*Donaldson, J. F.....	Sparta
Downer, F. N.....	Bowling Green
Everett, J. F.....	Cave City
Fox, Shirley.....	Winchester, R. R. No. 6
*Galloway, D. B.....	Corydon
Gardiner, Boone (Ky. Nurseries).....	Louisville, R. R. No. 10
*Hall, L. E.....	Oakville
*Harris, Chas. C.....	Butler
Hillenmeyer, H. F. & Sons.....	Lexington
Hornbeak, J. F.....	Sawyer
*Keeling, J. W.....	Elkton
Kleiderer, W. S.....	Henderson
Leeming, W. H.....	Shively
*Ligon, Dr. P.....	Henderson
*McGinnis, A. A.....	Bowling Green
***Moreman, C. G.....	Brandenburg
New Nanz & Neuner Co.....	Louisville
***Payne, J. J.....	Warsaw
*Piper, O.....	Clinton
**Richards, E. L.....	Franklin
*Samuels, W. B.....	Clinton
*Sandefur, W. A.....	Robards
**Schmaus, Geo.....	Paducah
*Smith, Prof. G. D.....	Richmond
**Smith Orchard and Nursery Co.....	Dixon
Stamper, O. W.....	Corbin
Symmes, W. W.....	Augusta, R. R. No. 1
*Walker, F. & Co.....	Louisville
Wells, Henderson.....	Louisa, R. R. No. 2
Witty, G. G.....	Bardwell
*Wood, J. C.....	Benton
Wood, Stubbs & Co.....	Louisville
*Young, Shepherd.....	Central City

SALES OF LEAF TOBACCO IN KENTUCKY.

The General Assembly of 1914 passed an act requiring each tobacco warehouse to make a monthly report of its sales to the Commissioner of Agriculture. The Department has deemed it wise to close the year's business

as of August 31st, as none of the new crop appears before September 1st. After consultation with the tobacco dealers and warehouse men, the tobacco grown in the State was divided into Burley, One-sucker, Unfired Dark, Fired Dark and Green River tobacco. The four last named are usually classed as "Dark tobacco," but in this report they are kept separate, and the number of pounds and the average price for each class is given separately, and then totaled and averaged.

It is impossible to ascertain definitely just how much money the 1914 crop of tobacco brought, as all of the crop has not yet been sold, and it is possible that part of that sold for dealers was grown by them, and a part of it bought by them and shipped, appearing for the first time on the market in dealers' hands. The value of each class as sold for growers is as follows:

Burley tobacco	\$21,825,496.51
One-sucker tobacco	631,163.28
Unfired dark tobacco	359,544.92
Fired dark tobacco	438,031.57
Green River tobacco	1,120,404.87
Total	\$24,374,641.15

Again, some of the crop was shipped out of the State or sold directly to the manufacturers. Of the 1913 crop sold for growers there is a value of:

Burley tobacco	\$158,354.46
One-sucker tobacco	2,532.24
Unfired dark tobacco	4,230.35
Fired dark tobacco	57,462.07
Green River tobacco	3,147.60
Total	\$225,726.72

Should there be as much of the 1914 crop in the hands of the growers at the present time as was held of the 1913 crop, we would have a total value for the 1914 crop of \$24,600,367.87, to which must be added the value of the tobacco held by dealers, and that which was sold without passing through the tobacco warehouses. A much larger portion of the Burley tobacco passes through the warehouses than of the dark tobacco. It is safe to estimate the value of the entire 1914 crop of tobacco at from \$30,000,000 to \$35,000,000.

REPORT OF ACTUAL SALES OF LEAF TOBACCO, AS REQUIRED
UNDER THE ACT OF THE LEGISLATURE APPROVED
MARCH 20, 1914.

Report Beginning August 1, 1914, and Ending August 31, 1915.

	1913 CROP		1914 CROP	
	Pounds	Ave. Price Per 100 lbs.	Pounds	Ave. Price Per 100 lbs.
Burley tobacco sold for growers....	1,991,880	\$7.95	299,389,527	\$7.29
Burley tobacco sold for dealers....	8,363,655	9.42	26,612,054	8.40
Burley tobacco resale.....	4,530,990	8.45	20,660,231	7.88
Total burley and average.....	14,883,520	8.92	346,761,803	7.54
One-Sucker tobacco sold for growers	48,885	5.18	11,311,170	5.58
One-Sucker tobacco sold for dealers	783,935	5.83	1,688,465	5.41
One-Sucker tobacco resale.....	140,895	5.68	472,796	5.01
Total one-sucker and average	973,715	5.60	13,472,431	5.32
Unfired dark tobacco sold for growers	81,825	5.17	6,374,910	5.64
Unfired dark tobacco sold for dealers	701,695	6.43	4,547,500	4.47
Unfired dark tobacco resale.....	76,905	5.43	990,560	4.93
Total unfired dark & average	860,425	6.22	11,912,970	5.24
Fired dark tobacco sold for growers	1,302,995	4.41	6,898,135	6.35
Fired dark tobacco sold for dealers	1,727,180	7.20	1,740,250	6.75
Fired dark tobacco resale.....	27,960	6.68	1,122,270	6.32
Total fired dark and average..	2,991,800	5.91	9,760,655	6.58
Green River tobacco sold for growers	63,205	4.98	18,580,512	6.03
Green River tobacco sold for dealers	558,565	4.90	1,513,450	3.90
Green River tobacco resale.....	66,025	6.61	83,785	5.92
Total Green River & average	687,795	5.01	20,177,747	5.98
Grand total and average.....	20,466,595	8.06	401,244,681	7.39

SPRAYING AND PRUNING DEMONSTRATIONS.

The Department of Agriculture has deemed it advisable to keep one or two men in the field during the months of January, February and March to give pruning and spraying demonstrations in different parts of the State. Kentucky has a great many valuable fruit trees that are not yet beyond redemption. The San Jose scale and the pear blight have discouraged a great many farmers and they have woefully neglected their orchards.

A representative of the Department of Agriculture, with a spraying pump and a few pruning instruments, has been able to secure a crowd to watch his operations wherever he has gone. Much good has been done by this work. As many as two hundred farmers have gathered together in one orchard to learn how to take care of their own. Probably five hundred dollars could cover all the cost of this work so far done, but it has been demonstrated that much good would follow a thorough canvass of the State in an effort to instruct the farmers when and how to spray and prune these trees, that are now capable of yielding great quantities of fruit, but when neglected produce a very inferior quality of but little value.

REPORT OF THE STATE FREE EMPLOYMENT BUREAU.

FOUNT KREMER, IMMIGRATION CLERK.

The work of the Free Employment Bureau under the management of the State Immigration Clerk continues to demonstrate the advisability of the State to maintain this work. The limited amount of \$2,000.00 annually is all that is provided by the General Assembly for conducting this office. This is not sufficient to bring about the best results. In my previous report, I called the attention of the General Assembly to the fact that the State of Illinois maintains six free employment bureaus in different cities throughout that State and has an annual appropriation of \$42,500.00. Missouri has three such offices with an annual appropriation of \$18,000.00. This work in Kentucky is beyond the experimental stage, and the tabulation as presented below will show the great number of applicants seeking an opportunity to earn their wages. It will be seen that during the year 1915, 716 positions have been secured at a cost of less than \$2,000.00. In other words, through the State's expenditure of less than \$3.00 some one has been able to secure a position wherein he became a wealth creator. With a properly organized force, it is believed that the average cost of each position secured can be reduced materially.

TABULATION OF STATISTICS OF STATE FREE
EMPLOYMENT BUREAU

From May 1st to December 31st, 1914.

MONTH	MALES		FEMALES	
	Applications Filed	Positions Secured	Applications Filed	Positions Secured
May	172	50	27	19
June	238	119	40	21
July	214	59	55	29
August	242	20	58	21
September	191	22	50	22
October	125	12	54	19
November	147	31	48	14
December	191	36	48	12
Totals	1,520	349	380	157

Total number of positions secured 506

From January 1st to December 31st, 1915.

MONTH	MALES		FEMALES	
	Applications Filed	Positions Secured	Applications Filed	Positions Secured
January	256	21	87	29
February	222	16	94	25
March	213	45	60	27
April	192	39	68	25
May	195	28	67	25
June	123	25	71	23
July	189	37	68	20
August	172	27	70	29
September	261	93	63	20
October	167	24	60	18
November	188	48	70	22
December	170	36	40	14
Totals	2,348	439	818	277

Total number of positions secured 716

CLASSIFICATION OF POSITIONS SECURED

During the Year 1914.

FOR MALES.

OCCUPATION	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bakers		1						
Blacksmiths		2	1	1	1			
Boys	1	4						1
Carpenters	1	3	10				1	1
Cooks	1	1	4	1	2	2	2	2
Dairymen	3	1	3		1	1	1	2
Engineers and Firemen.....		8	1					
Farm help.....	8	15	9	7	9	6	5	6
Factory help	2						2	
Gardeners	3						11	
Grocery clerks		5	1			1		
Hotel and restaurant help.....	6	12	1		5		1	
Housework	1							
Janitors, porters and watchmen	1	3		3		2		2
Laborers—Inside and ordinary.....	7	51	23	4				19
Machinists		1	1					
Mechanics		2			1			
Nurses	4						1	
Office help.....	1	1					1	
Painters and paperhangers.....	2	4	3					
Printing trades.....	1							
Plumbers	2		2					
Planing and saw mills.....	2	1			1			
Sales people and solicitors.....	4			1	2		6	2
Stenographers							1	
Teamsters		4		3				1

FOR FEMALES.

OCCUPATION	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cooks	3	7	8	15	5	10	8	11
Farm help.....	4	6	2		5			
Hotel and restaurant help.....	1	3	7	1	4		1	
Housework	8	5	6	5	5	4	4	1
Nurses	2		4		2	2		
Office help.....					1			
Sales people and solicitors.....	1					2	1	
Stenographers		1						
Washerwomen		1				1		

CLASSIFICATION OF POSITIONS SECURED DURING THE YEAR 1915—Continued.

For Females.

OCCUPATION	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bakers	11	7	21	12	14	14	18	9	12	8	13	7
Cooks												4
Factory help.....	1											
Farm help.....				2					3	4		2
Hotel and restaurant help.....			6	9	6	2	2	15	3	3	7	1
Housework	10	12		1	1	3		3	1	1		
Nurses		2				1						
Sales people and solicitors.....	7	1						2		1		
Seamstresses.....				1	1							
Stenographers.....						1						
Washerwomen					2	2			1	1	2	

THE KENTUCKY STATE FAIR

The Kentucky State Fair has continued to grow and has become a part of the work of the Department of Agriculture that requires more and more attention of the Commissioner, as ex-officio Chairman of the State Board of Agriculture and President of the Fair. The fact that it is located at Louisville and its business affairs transacted as separate from the financial affairs of the Department proper makes it necessary for the Commissioner to spend much of his time at Louisville to properly supervise the operation of the fair. When the fair was located in Louisville in 1908, the writer, then Secretary, planned not only for a show one week during the year, but to make the State Fair a great educational institution with permanent features connected therewith. To this end with the limited funds at the command of the State Board of Agriculture, 150 acres of ground were purchased, and an option secured on an additional tract of 45 acres. The appropriation of \$16,000.00 by the General Assembly of 1912 enabled the State Board of Agriculture to exercise its option on a tract of 45 acres. During my term of office as Commissioner of Agriculture, this has been divided into two tracts; one of 20 acres has been deeded to the Federal Government for the purpose of establishing and maintaining a Fish Hatchery, and will revert to the State Board of Agriculture in case the Fish Hatchery is removed therefrom. The other tract of 25 acres is now under agreement with the State Forestry Commission, of which the Commissioner of Agriculture is an ex-officio member, to be operated by the Forestry Commission as a forestry nursery, and on which is to be placed an arboretum that will ultimately be of great value to the State. Fifteen acres of the original tract has been set aside for a game preserve, and, in co-operation with the Fish & Game Commission of Kentucky, a most interesting permanent exhibit of animals and birds is gradually being collected. Properly supervised for a few years the Fish Hatchery, the State Arboretum, and the game exhibit will be at-

tractive and valuable features not only of the State Fair but will become a show place the year round of which Kentuckians will be proud. There is ample room on the State Fair grounds for a forestry and mineral building, in which should be collected a permanent exhibit of the State's natural resources. A manufacturers' building to exhibit permanently "Made in Kentucky" goods is the fifth project of the Chairman originally contemplated as a part of this State institution. "This dream is ultimately bound to come true." Three of the projects are already under headway, and the owners of mineral and forestry properties in Kentucky are seriously contemplating an effort to erect a permanent exhibit on the fair grounds. The manufacturers of the State will finally see the great value the fifth undertaking will be to them. It is our purpose in publishing the following papers bearing upon the different departments of the Kentucky State Fair, together with the financial statement thereof, to show the magnitude of the work that is already being handled at Louisville, and with the hope that the people of Kentucky will come to realize more and more the benefits of this work to the great mass of the people. Good seeds have been planted and it only requires careful nursing and guidance for the State Fair of Kentucky to become a factor in the State's development of importance second to no other State institution. The writer has spent three years as Secretary of the fair and the last four years as its President. He has fostered this institution from its infancy and relinquishes his connection therewith with regret, at the same time commending it to his successor and the members of the board as an institution fraught with great possibilities, and trusting that they will take the same deep interest in its welfare as he and his associates have done in the past.

(Signed)

J. W. NEWMAN.

FINANCIAL REPORT.

To the Members of the Kentucky State Board of Agriculture:

Herewith, is submitted the financial report of the Kentucky State Fair of 1915. This report shows total receipts from all sources, for the fair of 1915, are \$80,151.43, and that the total disbursements up to October 15th, including all the outstanding bills that were obtainable at that time, amount to \$72,771.33, leaving a net profit of \$7,380.10 for this year's fair. This, of course, does not include the running expenses of the fair from now until January 1, 1916, and some bills that were not in on October 15th. This report, also, does not include some miscellaneous receipts, which will come in from time to time, between now and the close of the year. These will be included in the final report, which will be made at the end of the year, after the books are examined and closed.

In comparison with previous years, and more especially 1914, which was the banner year, both in point of attendance and receipts, the showing made at this year's fair should be most gratifying. While the total receipts for last year's fair were \$3,378.67 in excess of this year, the difference is traceable to three sources, to-wit: catalogue advertising, special premiums and entry fees for saddle stakes, and old claims. Since the cost of printing the catalogue was materially reduced and the premiums for the saddle horse stake also reduced, there was but little, if any, difference in the actual results obtained from these sources or from the fair as a whole. Looking at the other side of the ledger, we find that the total disbursements for last year were \$79,933.09, which is \$7,258.57 in excess of this year's expenses; in other words, it cost about \$7,000.00 less to put on the 1915 fair. The following accounts show an increase in expenditures:

Exhibits	\$ 300.00
Lighting	300.00
Attorneys' Fees	250.00
Building and Ground Expenses	300.00
Total	<u>\$1,150.00</u>

The following accounts show a decrease in expenditures:

Catalogues	\$ 700.00
Shows and Hippodrome	500.00
Traveling Expenses	300.00
Police and Labor	500.00
Discount and Interest	700.00
Premiums	4,000.00

In submitting last year's report, it was suggested that the amount of money offered for premiums could be materially reduced, without seriously affecting either the quality or character of exhibits. In apportioning the money for this year's exhibit, the Board of Agriculture ordered a reduction of ten per cent. from the total amount of premium money offered for each department. This order was carried out as far as possible, and extended to nearly every department. It resulted in a saving of \$4,000.00 to the fair, and in the opinion of those best informed, did not materially hurt the exhibit in any department. On the contrary, the exhibit as a whole by far surpassed anything that was ever before assembled on the State fair grounds. Only in the Beef and Dairy Cattle Departments was there an appreciable falling off of exhibits, and that, as everyone knows, was due to the foot-and-mouth disease situation. In every other department the entries were larger and the exhibits were superior to any that had ever been shown at this fair before, with the possible exception of the Educational Department. For some reason, the secondary schools have not been sufficiently interested in making the exhibits in this department as creditable and as numerous as they should be; in fact, instead of the exhibits increasing from year to year, they seem to have fallen off. In all the other departments along special educational lines, such as the Stock-Judging Contest, Boys' Corn Club, Boys' Pig Club, Farm Boys' Encampment and Girls' Canning Club, etc., there was a noticeable increase in interest, in the number of entries received and in the benefits apparently derived from them.

The race meeting was by far the best in the history of the institution, and its value as a free attraction can best be attested by the throngs of people which filled

the grand stand and adjacent grounds every afternoon. The popularity of the night horse show in the hippodrome can, also, be attested by the increased attendance and receipts.

Every year emphasizes more strongly than the preceding one the absolute need of additional buildings and equipment. The fair has been maintained now for eight years, since it has been located in its permanent home, with only two substantial and permanent buildings. How long it will continue to give exhibitions with the present inadequate equipment, in the way of frame barns, temporary exhibition sheds and the like, is a problem that will have to be met sooner or later by the fair management. At the next meeting of the State Board, I expect to be able to submit a plan for the erection of a suitable Exposition Building, which, I believe, would prove a great acquisition to the fair and a valuable addition to the fair plant. There is another matter upon which I feel that every member of this Board is fully advised, and that is, if this fair is to continue to grow and prosper and to keep pace with the other great institutions in the north and west, it must necessarily be planned on a larger scale from year to year, and this will mean a corresponding increase in expenditure. Such an increase of expenditure can only be met by an increase in attendance, which is the main source of receipts. To attain this end, a stronger appeal must be made to the people of the State to patronize their State institution, and an especial effort should be made to enlist the interests of those more directly concerned in agriculture, which is the basis of the State Fair exhibit, and the promoting and fostering of which is the sole purpose of the institution itself. A like effort should be made to awaken an interest in the city people. This interest can only be aroused by staging popular attractions. Great crowds from the city cannot be assembled on the fair grounds without the aid of some spectacular amusement or attraction. While such features are necessarily costly, they almost invariably pay in the end. In other words, they are a necessity to a growing, expanding fair, in that they both draw crowds and help pay the expenses.

You will recall, at this time last year, there was an indebtedness of approximately \$15,000, incurred in making permanent improvements on the grounds in recent years.

With our profit this year applied to this indebtedness, it leaves it necessary to take care of only approximately \$7,000.00 or \$8,000.00.

In conclusion, I desire to express my great appreciation of the assistance rendered by the daily press of Louisville, the daily and weekly papers of the State, and commercial organizations of the city of Louisville and State of Kentucky.

Respectfully submitted,

(Signed) J. L. DENT,
Secretary.

STATEMENT OF CONDITION OF KENTUCKY STATE FAIR,
OCTOBER 15, 1915.

ASSETS.

Real estate	\$ 75,069.10		
Improvements	42,317.54		
			\$117,386.64
Live stock pavilion	\$103,447.01		
Race track and grand stand.....	44,769.93		
Temporary building	27,285.85		
Model cow and dairy barn.....	1,601.95		
Model school	2,061.19		
Judging pavilion	2,181.38		
Ground equipment	3,232.05		
Dining room equipment	104.82		
		\$184,684.18	
Implements and tools		189.78	
Furniture and fixtures		508.25	
Live stock		567.50	
			\$303,336.35
Accounts receivable		\$ 2,098.59	
Suspense (Accts. Rec.).....		216.75	
Petty cash		65.62	
State of Kentucky		6,414.54	
			8,795.41
			\$312,131.76

LIABILITIES.

Accounts payable "operating fund" \$11,030.45		
Accounts payable Main. and Lab. fund	3,411.79	
	<hr/>	\$ 14,442.24
Futurity stake		180.74
Cash overdraft		536.32
Main and Lab. fund. Bal. Cr.....		2,085.09
Permanent fund	\$287,065.50	
Net income year 1915 to Oct. 15, 1915 (books not closed until Dec. 31, 1915).....	7,380.10	
Crops & For. do.....	72.80	
Main & Lab. improvements, etc., (to be closed end of year into permanent fund)	368.97	
	<hr/>	\$294,887.37
		\$312,131.76

MAINTENANCE AND LABOR FUND TO OCTOBER 15, 1915.

Monthly pay rolls ground.....	\$ 4,484.39	
Feed	547.06	
Blacksmithing	98.50	
Fuel and lights	14.27	
Repairs	1,559.40	
Insurance	1,770.95	
Veterinary service	12.00	
Team hire	60.00	
Miscellaneous expense	3.05	
Harness	8.80	
Crops and forage	144.71	
Removal of barns	700.00	
Rent—1914	\$400.00	
1915	800.00	
	<hr/>	1,200.00
Buildings and grounds expense.....	99.00	
	<hr/>	\$ 10,702.13
Improvements	\$ 275.10	
Ground equipment	50.37	
Implements and tools	43.50	
	<hr/>	368.97
Total		\$ 11,071.10
Above items consist of following:		
Received acct. State appropriation		\$ 6,741.65
Paid by checks on operating fund for which no warrants from State have been received	\$ 327.78	
Checks issued for monthly pay rolls—warrant not received at time of this statement.....	727.88	
Same—veterinary service	12.00	
	<hr/>	\$ 1,067.66
Included in warrant for insurance —but amount deposited in bank		

and check for \$45.00 Robinson, Wilson Co. issued instead (policy cancelled)	150.00		
		\$	917.66
			<hr/>
		\$	7,659.31
Accounts not yet paid (unpaid bills)			3,411.79
			<hr/>
Total, as above		\$	11,071.10
Appropriation year 1914.....	\$ 10,000.00		
Amt. received 1914 to Dec. 31, 1914	6,843.81		
			<hr/>
Balance appropriation Jan. 1, 1915		\$	3,156.19
Appropriation year 1915.....			10,000.00
			<hr/>
		\$	13,156.19
Amt. received 1915 to Oct. 15, 1915			6,741.65
			<hr/>
Balance appropriation Oct. 15, 1915		\$	6,414.54
Unpaid bills, as above.....			3,411.79
			<hr/>
Leaves Bal. appropriation Oct. 15, 1915		\$	3,002.75
Checks as above for which no war- rant yet received.....		\$	1,067.66
Deposit as above insurance warrant	150.00		
			<hr/>
Amt. to be deposited to operating fund when warrants are received		\$	917.66
Would leave Bal. appropriation available for maintenance and labor fund, Oct. 15, 1915.....			2,085.66

OPERATING FUND YEAR 1915 TO OCTOBER 15, 1915.

INCOME.

Admissions	\$ 34,376.38		
Concessions	8,052.24		
Catalogues	1,297.10		
Races	5,050.00		
Stall rent	1,860.00		
Exhibitors' tickets	346.00		
Shows	7,527.80		
Poultry fees	451.75		
Dog show	424.75		
Miscellaneous	204.92		
			<hr/>
		\$	59,590.94
State appropriation	\$ 15,000.00		
Other premiums and entry fees:			
Special premiums.....	\$1,701.00		
Saddle horse stake.....	1,555.00		
Special saddle horse stake	362.50		
Roadster stake	680.00		
Harness stake	890.00		
Futurity stake, 60%.....	271.10		
		\$	5,459.60
			<hr/>
		\$	20,459.60
			<hr/>
		\$	80,050.54
			100.89
Old claims			<hr/>
		\$	80,151.43

EXPENDITURES.

Admissions	\$ 1,117.75	
Concessions	227.00	
Catalogues	1,537.96	
Exploitations	6,784.66	
Exhibits	4,895.31	
Shows	4,260.00	
Attractions	4,047.00	
Badges and ribbons	633.06	
		\$ 23,502.74
Traveling expenses	\$ 157.60	
State Board expense	87.86	
		245.46
Police and labor		1,706.30
Lighting		1,041.23
Office expense	244.21	
Stationery and printing	1,205.35	
Postage	948.66	
Clerk hire	1,713.30	
Telephone	213.57	
Telegrams	48.57	
Express	101.82	
Drayage	89.29	
Attorneys' fees	750.00	
Auditing and accounting	325.00	
Bonding fees	175.00	
Official dining room	682.00	
		\$ 6,496.77
Farm boys' encampment	\$ 611.03	
Hospital service	113.20	
		724.23
Building and grounds expense.....		1,441.60
Damages and accidents		22.20
Discounts	177.32	
Interest	281.75	
		459.07
Administration		3,583.35
Auto hire	\$ 365.55	
Com. Agriculture office expense....	95.93	
Miscellaneous expense	173.73	
Profit and loss (miscellaneous).....	7.41	
		642.62
		\$ 39,919.57
Premiums		32,293.25
		\$ 72,212.82
Old liability		558.51
Total expenditures		\$ 72,771.33
Net income (gain)		\$ 7,380.10
Running expenses and bills not yet in between Oct. 15, 1915, and Jan. 1, 1916 (estimated)).....		2,000.00
Would leave net income (gain)		\$ 5,380.10

HORSE DEPARTMENT.

The entries in the Horse Department of the fair of 1915 exceeded in many ways those of all previous years. There were more horses on hand, the quality ran more even, and the entries were better distributed in the various classes.

In past years the Horse Show has always been a source of gratification to the management. To it the greater part of the fair-going public look for entertainment; and the general public judges the success of our fairs almost entirely by the merits of its Horse Shows. This is an attribute one would hesitate to defend. It is to be deplored, from an agricultural and educational viewpoint, that it exists to the extent that it does; but in Kentucky it is, nevertheless, a fact.

We have always had a very satisfactory Horse Show, each succeeding year surpassing in some way all those preceding it; but it remains for 1915 to show a decided step forward. This improvement has not been so much in numbers, as in quality, and while the best of the 1915 show is no better than the best of other fairs, the evenness of the entries argues that the horses are being culled previous to this show, and hence it has come to the point where there was an almost complete absence of animals that would not be a credit to the exhibitor, in victory or defeat.

In another way there was evidence of a forward step—In previous years, there have been a number of exceedingly “top-heavy” classes shown, and a corresponding number of lightly filled ones. This year, however, such has not been the case, the entries running with surprising evenness in all the classes.

The show given in the Horse Department this year was close to its capacity. The stalls were filled; the show on some days lasted from 10 a. m. to 11:20 p. m., with intermission for the vaudeville performance. It seems as if the number of classes was approaching the maximum, unless the Department is sub-divided into several divisions, with separate organization.

From the inside, it appeared that the spectators were more interested than in any former year. When shows of real interest were being given, there was always an audience, and an appreciative one.

GUTHRIE WILSON,
Superintendent of Department.

MULE AND JACK DEPARTMENTS.

In both the Mule and Jack Departments, the numerical high mark of 1914 was not maintained, but the exhibit was, nevertheless, exceedingly good. The competition was strong, the quality good, and the judging seemed to give satisfaction to the exhibitors.

The depression in the mule market accounts for the numerical falling off in both these Departments. The fair is making actual progress in these lines; and not only is there no cause for discouragement, but under normal conditions, it will only be a question of a few years until the Kentucky State Fair will have the premier show in mules and jacks, as it already has among the light horses.

GUTHRIE WILSON,
Superintendent of Department.

DAIRY CATTLE.

The exhibits of dairy cattle were curtailed this year because of the recent epidemic of foot-and-mouth disease. There were 67 Jerseys, 16 Guernseys, 13 Ayrshires, and 6 Holsteins on exhibit at Louisville. At the Indiana State Fair there were but 62 Jerseys, which indicates that we had a good exhibit of this breed at the Kentucky State Fair. Despite the rather small entries of the other breeds, there was no lack of interest in the Dairy Cattle Department. Fortunately, we had secured the services of a very competent judge and lecturer in the person of

Mr. Hugh G. VanPelt, of Waterloo, Iowa. Because of the rather meager entries in some of the classes there was an abundance of time in which to judge the dairy stock, and for that reason the visitors and exhibitors were encouraged to ask Mr. VanPelt any questions that arose in their minds. As a result there was always a group of interested spectators about him as he judged the cattle, and they stated that they learned a very great deal about dairy cattle from him. Some of the oldest breeders stated they had gained much information about dairy stock while at the State Fair.

On Friday morning at 11 o'clock, Mr. VanPelt made an address in the small judging pavilion to an audience of two hundred people in regard to the points of the dairy cow. We secured two excellent cows from each dairy breed, and in concluding his address Mr. VanPelt told the people in the audience why he preferred one of the cows above the other. The audience who heard Professor VanPelt was composed of over one hundred boys from the Farm Boys' Encampment, prominent breeders of dairy cattle, and visitors.

In the past few months there has been some discussion about reviving the large Jersey cattle show that used to be held in Shelby county, but I believe that the breeders now see the wisdom of combining all of their energies with the State Fair, in order that a show of Jersey cattle may be made at Louisville next September that will rival the exhibit held at the National Dairy Show in Chicago. A movement was started by the breeders of Jersey cattle to duplicate the premiums offered by the State Fair. In past years the State Fair has appropriated \$898 for premiums for Jersey cattle. I believe it is going to be possible before next September for the breeders of Jersey cattle in Kentucky, through private subscriptions, and through financial assistance from the American Jersey Cattle Club, to duplicate these premiums so that the total premiums for Jersey cattle next September will amount to \$1,796. Mr. VanPelt stated that with such liberal premiums we might expect an entry of some four hundred Jerseys at the next fair.

PROF. J. J. HOOPER,

Superintendent of Department.

SWINE DEPARTMENT.

An honorable feature of the swine exhibit at the Kentucky State Fair was the exhibit of eighteen pigs by members of the Boys' Pig Club of Kentucky, in charge of Otis Kercher, Kentucky Agricultural Experiment Station.

These pigs were representatives of only four counties, although pig clubs have been organized in fifteen counties of the State. The counties represented at the fair were Jefferson, Christian, Crittenden and Woodford. Although small in numbers, the quality of these pigs and the interest shown by their little owners compelled the attention of the visitors to the swine barns to a larger degree than any other one swine exhibit.

One of the most forcible examples of the difference that comes from using the balanced ration in opposition to the "old man's method," as Mr. Kercher styles it, is shown by the entry of Moser Brothers, two young Jefferson county boys. The boys took two pigs from a litter, and the father a third one. The three are in the same pen. The one raised on corn by the father, weighs a little more than fifty pounds, while the two raised by the boys tip the scales at more than 220 pounds each. The sons know that it cost them four and one-half cents to produce their pigs, while the father does not know what his runt cost.

Ernest Minner, of Marion, Crittenden county, has a pig on display which shows he knows his business, and that he can make money on porkers. The pig is now a little more than six months old, and weighs 255 pounds, and is valued at \$40.00. He bought it from his father for five cents a pound when it was two months old.

He has not only this book profit, but the pig won first prize in its class at the Crittenden county fair; and also secured for its owner a free trip to the State Fair. Ernest was one of the proudest boys on the grounds.

John Woodward, of Wilmore, was easily the most disheartened boy who had a pig entry. He had a pig which weighed 330 pounds when it was shipped from home. It died in the wagon between the station and the

fair grounds. John was on hand early in the morning, but could not find his pig. When Mr. Kercher appeared, he asked about his entry, and was informed that it had died. The boy was heartbroken, because he had hoped to win the prize.

"Lady Wonderprice," a Big Bone Poland China pig, weighing 252 pounds, won a niche in the State Fair's gallery of famous exhibitors for Gordon Nelson, Jr., of Hopkinsville. After capturing first prize for the best registered hog of any breed or sex, over six months old, and less than one year, Lady Wonderprice was pitted against twenty-four choice pigs raised in several states, most of them by old farmers, and again it was victorious. The boy's pig won the prize money for showing the greatest gain in weight at the lowest cost, increasing from sixty to 252 pounds by September first.

Hogs raised by the Boys' Pig Club, that were on exhibition at the fair, were sold (September 15, 1915), through the Bourbon Stock Yards by Mr. O. Kercher, State Agent of the Boys' Pig Club, at a premium price of \$8.15 a hundred, which was 25c a hundred above the top market price on this class of hogs.

Nearly everybody that saw these pigs on exhibition considered them one of the finest lots of hogs that were seen in this locality for a long time.

PRIZE WINNERS.

1561. Best registered hog, any breed, male or female, over six months and under one year:
 1st, \$15.00—Gordon Nelson, Hopkinsville.
 2nd, 10.00—Ernest Minner, Marion.
 3rd, 5.00—Wilson Ogden, Marion.
1562. Best grade hog, male or female, over six months and under one year:
 1st, \$15.00—Regis Alexander, R. R. No. 1, Midway.
 2nd, 10.00—Scrogan Jones, Buechel.
 3rd, 5.00—John Moser, R. R. No. 18, Anchorage.
1564. Pig showing largest gain per day at least cost:
 \$5.00—Gordon Nelson, Hopkinsville.
- Extra Sweepstakes hog—one hog Joy Oiler:
 Regis Alexander, Midway.
1565. Best Duroc Jersey, eligible to record (male):
 \$15.00—Newton B. Simcoe, St. Mathews.
1565. Best Duroc Jersey, eligible to record (female):
 \$15.00—Wilson Ogden, Anchorage.

1567. Best Duroc Jersey, not eligible to record (either sex):
 1st, \$10.00—Regis Alexander, Midway.
 2nd, 6.00—Scroggan Jones, Buechel.
 3rd, 4.00—John Moser, R. R. No. 18, Anchorage.
1568. To the member of the Kentucky Pig Club being the best judge of a ring of swine:
 1st, Silver Cup—Ray Jones, Williamsburg.
 2nd, \$10.00—Edward J. Hartman, Buechel.
 3rd, 5.00—John Moser, R. R. No. 18, Anchorage.
1569. Best Hampshire Hog:
 Silver Cup (\$10.00)—John Woodward, R. R. No. 1, Wilmore.
 C. C. WHEELER, Supt.

SHEEP AND GOATS DEPARTMENT.

Complying with your request for a brief account of the interesting features of the Sheep and Goats Department and summary of the show at the Kentucky State Fair this year, I am pleased to state that in spite of reported fresh outbreaks of foot-and-mouth disease in Illinois, and the unsettled conditions resulting therefrom, the show in this Department may be considered a distinct success.

Possibly a larger number may have been on exhibition in former years, but I doubt if at any time since this fair was inaugurated, has there been an exhibit of higher quality. Many of the flocks were being fitted for the Panama Exposition, and if no accident befall them, will be heard from at that great show.

One of the most pleasing features of the exhibition was the strong showing made by Kentucky exhibitors, Mr. Turney C. Collins, of Leesburg, Kentucky, showing a flock of cheviots good enough to divide honors with so good a flock as that shown by Mr. R. D. Grieve, of Xenia, Ohio (a flock that looked invincible to many of the spectators); Mr. E. M. Shrout, of Georgetown, Kentucky, a flock of Southdowns of correct type and superb quality, that held its own with the well-fitted flock of Axe & Millett, of Indiana; and the Walnut Hall Hampshires were well represented in numbers, the quality fully up to, or possibly surpassing, that of former years, winning in every class.

Mr. Thomas, of Oakland, Kentucky, was on hand with his beautiful Angoras, but Mr. Malone, also a Kentucky exhibitor, furnished strong competition, and won a goodly portion of the prize money.

Very notable exhibits were the fine wool flock of R. D. Williamson & Sons, of Ohio, the Oxfords of Mr. M. R. Purviance, of Indiana, and the Dorsets of Mr. H. H. Cherry, of Ohio. Probably nowhere in America could better flocks of these breeds be seen. They would be a credit to any State Fair, Live Stock Show or Exposition in the world. All three of these flocks will be shown at San Francisco in November.

In the Shropshire classes Axe & Millett won most of the money on their well-fitted entries, though the strong, rugged sheep of Frank Henn, of Illinois, who furnished the competition, looked so good to the Kentucky farmers that Mr. Henn sold his entire show flock, comprising sixteen head, to farmers and breeders out in the State before the show closed. Numerous sales were made by other exhibitors, indicating a keen demand for good sheep. This demand has existed for some time, and many exhibitors have been heard to remark that they had more inquiries for sheep at Kentucky State Fair than any other on the circuit.

Cotswolds were well represented in the flocks of Mr. Mitchell and Mr. Daniel Bryan, of Indiana. Both flocks brought some grand individuals, nicely fitted, and furnished many interesting contests.

A fact worthy of comment was the interest shown by spectators in the judging of the classes. That master shepherd, Professor Frank Kleinheinz, of the University of Wisconsin, who awarded the prizes, always does his work in such a manner as to interest and instruct those present; and it was gratifying to note the eagerness of so many Kentucky folk to take advantage of the opportunity to learn the good and bad points of the individuals showing and hear the judge patiently and clearly give his reasons for placing one animal at the head of its class, another second, and so on down the line. The constant stream of visitors passing back and forth through the alleys of the sheep barns asking a thousand and one questions concerning the various breeds on ex-

hibition, was a strong and convincing answer to the charge so often made that the horse show at the fair is the only feature that interests the Kentuckian.

There were so many interesting features of the show in the Sheep and Goat Department, that to mention them all my report would not be brief.

Respectfully submitted,

P. B. GAINES,

Superintendent of Department.

POULTRY DEPARTMENT.

The Department of Poultry and Pigeons staged during the 1915 exhibition far outnumbered any of the previous efforts and reached the grand total of 1,780 birds. For the first time in the history of the Fair, and to further attest the popularity and growth of the poultry department as an advertising medium, we were this year rewarded with entries of some of the most widely known fanciers of the more popular strains of poultry and pigeons, and quite a few applications have already been received asking that the classification for another year be enlarged to accept every known variety, and we are sure of the co-operation of the fair board to enable the fulfilling of these requests.

Not only in point of number was the exhibition a success, but also in almost every breed, and many comments were made on the quality exhibited, and several who have made the show in former years and thinking that the competition would not necessitate such extreme care and conditioning necessary to carry off the honors in a National Winter Exhibition, were sadly disappointed when they arrived and the birds were placed in their coops ready for judging.

One well known artist from Chicago was very much surprised to find Kentucky could give just as good an account in a poultry way as along other lines of live stock, and made the comment that competition was as strong in some classes as he had noticed anywhere, and when artists from Buffalo, Chicago and Cleveland came

to our fair for no other purpose than to photograph winning poultry on exhibition at the Kentucky State Fair, why should we not be proud of the department? One well known Kentucky fancier made a collection of White Plymouth Rocks, the strongest class shown, from New Jersey, Mississippi, Missouri and Indiana, and had an entry of half a hundred fine birds to win for him the ribbons he carried home. Another class deserving mention was the White Wyandotte, only a trifle fewer in number than the Rocks, and just as good in quality, and to enumerate them all would be a task and require too much space. Yet all in all, if proper encouragement is given we are assured of the greatest and finest show for 1916 ever on the Kentucky State Fair Grounds.

JOHN T. ADAIR,
Superintendent of Department.

DOG SHOW.

The Dog Show at the 1915 Kentucky State Fair was the best in the history of this Department, both in quantity and quality. We had benched something over two hundred dogs, and very few inferior ones, many great dogs coming from Chicago, Minneapolis, Cincinnati, Columbus, Lexington, etc., in addition to a splendid show of local dogs. The star feature of our show was the police and Dalmatian dogs shown by Mrs. Yates, of Virginia. The entries are heavily increasing each year, and more roomy accommodations will soon become imperative.

H. M. WOOD,
Superintendent of Department.

VEGETABLE AND MELON DEPARTMENT.

Complying with your request for an account of the important features of the Vegetable and Melon Exhibit at the recent Kentucky State Fair, I feel that we had about as interesting an exhibit as could be expected con-

sidering the season. This was particularly the case with such vegetables as are grown in large quantities in this county, such as sweet potatoes and Irish potatoes. The melon exhibit was almost a failure, as their was no home crop to speak of.

There seems to be more interest manifested in the exhibits of this Department, and with a favorable season I feel this interest will grow and the exhibits continue to increase.

CHAS. SCHOLTZ, JR.,
Superintendent of Department.

FIELD, SEED AND GRAIN DEPARTMENT.

The Field, Seed and Grain Department of the 1915 Kentucky State Fair was one of the most attractive and interesting shows we have ever had. While there were only three county exhibits, they were very fine, and well arranged, and excited favorable comment from the interested crowds that view them. These exhibits were from Jefferson, Hardin and Oldham counties.

In Lot 293, Farm Products, the exhibit was very attractive and extensive, and it was often taken for a county display.

The corn exhibit was greater than ever, and the interest manifested was greater than I have ever noticed before. The ten-ear and single-ear displays were most attractive, judging from the remarks passed by the spectators who remained about the tables all day.

The small grain, such as wheat, oats, barley, rye, etc., were not overlooked. Many were the questions that men in charge were called upon to answer. There were other products of the farm in this Department that were more or less interesting and attractive, for instance, sorghum, hemp, kaffir corn, grasses, clovers, etc.

G. N. MCGREW,
Superintendent of Department.

TOBACCO DEPARTMENT.

The Tobacco Exhibit at the State Fair is becoming more of an attraction each year, and the 1915 exhibit so far as quality is concerned, was the very best we have ever had, both in Dark and Burley. The entry list on old Dark tobacco was the largest we have had, and represented a larger scope of territory. The exhibit of new Dark tobacco was not so good, owing, no doubt, to the lateness of the crop. The samples sent did not represent the various types as closely as heretofore.

The Burley entries were splendid in quality, but short in quantity; however, the entries came from sections that had not exhibited before, which would indicate that more of our tobacco growers are appreciating the splendid opportunity to advertise their product, as well as their county.

We hope that before the time of the 1916 fair, we will be able to so thoroughly advertise the Tobacco Show and its possibilities, that each tobacco-growing county will be represented.

Thanking you for your splendid co-operation in all the efforts I have made to extend this Department, I am,

Most respectfully yours,

EVAN S. REES,

Superintendent of Department.

THE APPLE SHOW AT KENTUCKY STATE FAIR.

Few people fully appreciate the important position fruit growing occupies in the agriculture of Kentucky. Ordinarily when one thinks of fruit production his thoughts are sure to carry him to the widely advertised States of Oregon, Washington, New York, Michigan, Ohio or Indiana. According to the census of 1910, of the fifteen leading States, Kentucky stands ninth in the point of number of apple trees of bearing age; but in production she stands fifth, exceeding her sister States, Illinois, Ohio, Indiana and Tennessee.

The horticultural exhibit of the Kentucky State Fair is undoubtedly one of the greatest factors in educating the people of Kentucky, and other States as well, to the importance of orcharding as an industry. It emphasizes the fact that this year Kentucky grew over twelve million bushels of apples, an amount greater than the combined production of the widely heralded States of Washington and Oregon.

The purpose of the fruit exhibit at the State Fair is two-fold. The first aim is to aid the fruit growers of the State to produce better apples and to market them in a way that will do credit to the State. Here the growers see and learn what good fruits really are. Fruit from every part of Kentucky was on exhibition and a great deal of valuable information was picked up by the various exhibitors in discussing their methods of production. Fruit from Eastern Kentucky competed with fruit from Henderson and Paducah, and it is highly gratifying to the officials in charge to know that the premiums for the most part were well distributed. For a number of years exhibitors from Henderson and Louisville captured the lion's share of the premiums. Lately a change has been noticed and every year the premiums are becoming more widely distributed. This is due in a large measure to the vigorous educational campaign conducted by the institute forces of the State Department of Agriculture and the Extension Division of the Kentucky State University.

The second purpose of the horticultural exhibit is to impress the public with the idea that Kentucky can produce as good apples as grow in any other section, and for the most part better apples so far as flavor and keeping quality are concerned. The fruit exhibit does much to impress the general public that Kentucky can produce choice fruit at five or ten cents less than the northwest, and can market these at a saving of 30c to 35c per bushel.

Apples by no means constitute the whole exhibit. Splendid displays of peaches, especially from Jefferson and Bullitt counties, always attract a great deal of attention. Although the grape display was small, the quality was unusually good. The department owes a great deal

to Col. Young, of Shively, for the interest taken in the production of this valuable fruit.

This is an age of co-operation. Heretofore fruit growers represented so many units interested solely in their own affairs. At the present time they are beginning to work harmoniously together on a number of projects for the betterment of horticultural conditions. The annual gathing of fruit growers at the State Fair is welding together a number of men who will work co-operatively for the mutual benefit of all. Each year sees more force added and it will only be a short time until Kentucky will cut down the heavy tax paid annually for imported fruit that could be grown at home.

PROF. J. H. CARMODY,
Superintendent of Department.

PLANTS AND FLOWERS DEPARTMENT.

As Superintendent of the Plants and Flowers Department at the Kentucky State Fair, would say that from an artistic standpoint it was a very great success.

All classes in plants, cut flowers and artistic floral work were entered into with much enthusiasm, competition was very keen, and the result was a most excellent show.

I have worked earnestly for the past two years to secure more space for this Department, so that it could be improved and extended, and hope the Board of Agriculture will see the wisdom of doing so in the near future.

WILLIAM MANN,
Superintendent of Department.

WOMAN'S DEPARTMENT KENTUCKY STATE FAIR.

One of the most attractive features at the Kentucky State Fair is the Woman's Department, which is not only a credit to the State, but should be the pride of the State. The department has three divisions, Art,

Culinary, and Textile. The culinary division presented this year a beautiful display in canned, preserved and pickled fruits and vegetables, and jellies, also bread, pastry and fancy candies. The textile division had a large and attractive exhibit of embroideries and lace work, and each class was well filled, so much so, that in some classes the entries would number from seventy to eighty. The art division has never been very full from the fact that all art work is expensive and the premiums have never been sufficient to encourage exhibitions, although this year's display was much larger than it has been in previous years. This display includes craft work, china painting, water color, oil, crayon and photography and showed a marked improvement in each class.

Each division has contributed its share in the education of the women of our State and reached a standard of excellence far beyond the expectation of the Fair management. This department is managed by a superintendent, assisted by four assistant superintendents, whose duties are to receive the entries, check them and distribute in classes ready to be judged. After each class is judged the articles are then placed on exhibition. At the close of the Fair these articles, which numbered about 4,000 this year, are checked again according to the entry blank of the exhibitor and carefully and securely wrapped to be returned to the owner. The department has grown so large that the quarters it now occupies are not adequate for its purpose, and a woman's building is almost imperative. Each year new glass cases have been added in which to house the articles, and the increase in articles exhibited this year crowded the displays and many beautiful things that should have been shown to the public were covered up through this cramped condition.

There is more in the Woman's Department for the women of Kentucky than the competitive exhibits, for it has proven a great educational medium and a higher standard in woman's work has been realized through their persistent efforts to receive the first or second premiums on articles entered, until this year when practically all entries in each class were of such a high merit that every entry was worthy of consideration for awards.

The interest and enthusiasm is steadily growing and through the mailing list, which includes every county in the State, the department succeeded in securing exhibits from nearly every section of the State, thus making it truly a "State Fair."

This work that is broadening and educating our women of Kentucky and giving them an inspiration to produce the best in home-making and home industries should not only interest the Fair Association management, but should be a State pride which our State officials and members of the General Assembly should protect and encourage by their hearty support.

(Signed) MRS. HARRY McCARTY,
Superintendent of Department.

FORESTRY EXHIBIT.

The Forestry and Mineral Exhibit at the Kentucky State Fair in the fall of 1915 was somewhat larger than any exhibit of this character heretofore made. The forestry end of the exhibit consisted largely of material furnished by the Forest Service of the U. S. Department of Agriculture, and was more extensive than the material heretofore displayed. Views of various forest and lumbering operations in Kentucky were shown by means of bromides, charts, transparencies and maps. Various phases of forest activities were emphasized, particularly those which showed waste which could be avoided in connection with the lumbering operations. The willow industry was illustrated not only with views of the various phases of the industry, but also with actual material showing the manufacture of willow into baskets. Charts were displayed showing the consumption of hardwoods in connection with the various forest industries, and the proportion of hardwoods used in each industry. An interesting feature of the display were show cases illustrating the use of various woods and especially showing how various by-products are utilized in the character of small articles.

The mineral exhibit was confined largely to the coal products of the State, and was more extensive than pre-

vious years, although not commensurate with the mineral resources of the State. Coal from both the Eastern and Western fields was displayed and the coke manufactured from the coal for various purposes was also illustrated by samples. Limestone of various character was shown, and also building rock as exemplified by the Bowling Green sandstone. The new bituminous asphalt field in Western Kentucky was represented by samples of rock and the manufactured product.

As a decorative feature of the entire exhibit, specimens of various trees native to the State were used as far as they could be obtained.

J. E. BARTON,
State Forester.

STOCK JUDGING CONTEST.

You have generously endowed the stock judging contest among the students and farm boys to the extent of \$250. This year there were twenty advanced students, ten freshmen, and five farm boys entered in the contest. Twenty students competed for the handsome cup valued at \$50, which is offered by the American Saddle Horse Breeders' Association for the best judging of saddle horses. The contestants judged at least four rings of each type of stock, which included horses, cattle, sheep and hogs. They worked earnestly for three days in an effort to win some of the premiums that were offered. The exhibitors of stock have always been exceedingly kind in bringing out any class of stock that we want to judge, and the superintendents of the various departments have rendered valuable assistance in getting together groups of animals to judge.

J. J. HOOPER,
Superintendent of Department.

EDUCATION DEPARTMENT.

I have the honor of reporting to you that the Education Department at the State Fair had a creditable and instructive exhibit.

First, and best, there was the building itself, with its out-buildings, showing plan of school architecture. This is a most valuable feature which is being copied in many counties in the State.

Second, the exhibit of work done by school children along the lines of manual training and domestic science was a fairly good one, though not an extensive one. This exhibit remained in the building all week, and excited much favorable comment. It showed the lines of improvement in the country schools.

Third, the School Garden Exhibit of the Brandeis School in Louisville was excellent. It was surrounded by admirers all day long. The promoters of this worthy experiment kept someone with the exhibit all the time to explain it. The exhibit consisted of the products of the flower and vegetable garden, both green and canned. It showed what a "School Garden" could be and do, and what it ought to be and do.

Fourth, the exhibit of manual training and of sewing of the School of Reform at Greendale, Fayette county, was large and interesting. It showed what the best schools are doing along these important lines. This exhibit was under the direct control of Mrs. Martin of that institution. It was viewed and admired by thousands of visitors.

Fifth, the exhibit of the State Department of Education, showing how the department is aiding the schools of the State, excited a great deal of comment. There was shown such bulletins as the "State Course of Study," the "History of Education," the "Arbor Day Book," and many others as valuable. Altogether about 4,000 bulletins were distributed. Hundreds of people came and asked for them after the supply was exhausted.

T. J. COATES,
Superintendent of Department.

DAIRY PRODUCTS.

The exhibits of farm butter and cottage cheese have become more extensive with each succeeding fair. It was only three years ago that premiums were established for the dairy products, and yet this has become a very

interesting department of the State Fair. This year there were twenty-five entries of farm butter, and fifteen entries of cottage cheese, two exhibits of creamery butter, and these products were sent from widely separated places in our State. Paducah and Bowling Green were represented in the list. Mr. C. O. Ewing, of Louisville, an extensive dealer in milk and manufacturer of butter, judged the dairy products.

MODEL DAIRY.

The Model Dairy on the State Fair grounds has been operated for several years. It has become one of the leading attractions of the fair. Four Holstein cows were stabled in the up-to-date stalls and were taken care of and fed in such a way as to instruct the visitors. In the Model Dairy Room, which adjoins the Model Dairy Barn, such operations as cooling and bottling milk, separating cream, churning butter, and sterilizing dairy utensils were carried on. A student operated the Babcock butter fat tester throughout each day, and hundreds of visitors learned how to operate this useful test. Many dairymen brought samples of milk which were tested for richness. Through the kindness of the management of the State Fair the cattle barn that adjoins the Model Dairy was changed into a Convention Hall. The rear part of the hall was provided with a speakers' stand and about two hundred chairs. Moving pictures were displayed in this hall during the daytime, and they served to teach useful lessons in regard to the care of live stock, and the construction of concrete buildings on farms. The extensive exhibits from the Experiment Station were displayed in the front part of the Convention Hall. It attracted considerable attention, and the attendants from the Experiment Station were constantly surrounded by interested groups of spectators as they explained the various charts and exhibits. This hall is a delightful place for people to stop for a few minutes to rest, and to hear lectures or to see the moving pictures. It is a most useful addition to the Experiment Station equipment at the fair.

J. J. HOOPER,
Head of Department.

FARMER BOYS' ENCAMPMENT.

As Superintendent of the Farmer Boy Encampment, I have the honor to render you the following report:

There were present at the Farmer Boy Encampment 100 boys. These boys were met at the trains and escorted to camp. Monday the following routine was established:

Reveille—6:00 A. M.
Roll Call.
Physical Exercises—20 minutes.
Police Duty.
Breakfast—7:00 A. M.
Lantern Slides and Lectures—Forenoon.
Dinner—12:00 A. M.
Visiting Exhibits—Afternoon.
Horse Show—Evenings.
Check Roll Call and to bed immediately after show.

The membership consisted of members of the Corn and Pig Clubs and boys appointed by members of the Board of Agriculture from counties having no such organizations.

No accidents, no sickness. Kenzie Crutcher, of Nicholasville, Ky., was sent home upon advice of Dr. McCormack because of a bladder trouble evident before he left home.

Quarters were comfortable and convenient, canvas ample.

No disobedience or infractions of rules. Had a few *sure enough* boys, that were disposed on the first night to become a little rough and have some horse play, but this was soon ended.

The boys were the recipients of many courtesies, visiting Louisville one day in a body. They were given souvenirs and soda waters; went in and through Levy Bros.' store; through the First National Bank at 5th and Jefferson, and looked on the city from its top; were taken all through a big steam boat and many other places of interest.

Their caps admitted them gratis to Conn T. Kennedy's Shows and to the Pavillion.

They were addressed by several notables, having among others a dairy cattle lecture by Hugh Van Pelt.

I desire here to express the appreciation of the entire demonstration force for the impetus given their work by this new method of selecting the personnel of the farmer boy encampment.

Respectfully submitted,

B. G. NELSON,
Agent in Charge Boys' Club Work.

BABY HEALTH CONTEST.

A Baby Health Contest is not an advertisement or a fad, but a serious effort on the part of its directors to help mothers find out the standing of the baby, as compared to that of other children of his age. For a long time baby shows have been features of fairs where good looks and good clothes took the prize.

The score card used is that prepared by the American Medical Association, and it is endorsed by physicians generally. It covers points of physical and mental development; the standard marks are made from statistics covering children in all States of the Union, to the number of several thousand, forty, I think. Each baby is examined by several doctors for teeth and throat, for weight, height, and other measurements; for walking, running, and other muscular movements; for condition of skin, hair, etc., and for mental advancement.

The third contest held by the Kentucky State Fair was an entire success. The entries the first year were 136, but not all of these were examined; the next year there were 180; and this year 221. All but twenty of this last number were examined, failure to reach the city or some sudden illness being the chief causes of failure to come at time appointed.

When the baby's name is received, the parents are sent a card telling them when to bring the child for examination. This year the examiners were: For mental test, Dr. Sam P. Myer; for dental work, Dr. E. C. Hume; for nose and throat, Dr. George Robertson; for general physical development, Dr. John Bedinger and Dr. J. H. Pritchett, Dr. Irvin Lindenberger being in general

charge. When the baby appears for examination, the mother sits by enrolling clerk, and some little family history is noted on the card—such as age, nationality of parents, system of feeding employed, and general care. The next step in the examination is the mental room. This is most interesting, but quite simple, and suited to babies, as the age limits are from twelve to twenty-four months, and twenty-four to thirty-six months. Imitations of sounds and movements, pointing out objects in pictures, naming and showing features, as mother's eyes, mouth, etc., are among the methods used in testing alertness and mental development.

Next is the physical room, where the baby (undressed) is weighed and measured by a specially prepared measuring board, and where the throat, etc., are examined. Children who live in Louisville are examined the week before the fair, at the offices in the Paul Jones Building, while those living outside of Louisville are examined on the fair grounds during the week of the fair.

The house was built especially for this work, and has screen wire around all sides, so that those interested may watch the work from the outside, and not disturb either children or examiners. In order to make the work continuous, a special prize has been offered to the child who makes the greatest gain over his own previous score, whether he was a prize winner or not, though the entries are still in the age limit of thirty-six months.

There has been a confusion in the minds of some as to just who is a city baby. City in the fair catalogue includes all the classified towns in the State, but a baby must live in a community of less than one thousand population if he is to be classed as a rural baby; and, of course, those living on farms and very small places are in this class.

As the work goes on, we are able to trace several good effects. Parents have come to know that prizes are awarded for health standards, not favoritism or beauty; consequently, they value highly the examination which points out the defects. While these defects are pointed out, the way to remedy them is made plain, and many children have been returned from one year to the next with improvement that even a layman can see.

The welfare of the child is a common meeting ground, and the friendly interest which prevails among parents from all walks of life is very gratifying.

MRS. JOHN L. WOODBURY,
Superintendent of Department.

GIRLS' AND BOYS' CLUB DEPARTMENT.

This is the first year that any attempt has been made to properly exhibit the work of the girls and boys of the State of Kentucky at the State Fair. The department was suggested by the Commissioner of Agriculture, and was carried out by him in co-operation with the U. S. Department of Agriculture at Washington, and the Kentucky Agricultural Experiment Station at Lexington. There were four distinct departments: The Girls' Canning Clubs, the Boys' Corn Clubs, the Boys' Pig Clubs, and the Girls and Boys Poultry Clubs. Each department was superintended by a specialist from the Extension Department of the Kentucky Agricultural Experiment Station. Lack of space prevented this exhibit from being grouped into one building, and each department had to be shown in different buildings. This prevented visitors to the State Fair from grasping the importance and wide scope of the work that is being done by the girls and boys of the State.

CANNING CLUB DEPARTMENT.

This department was made up from entries from twenty counties, and was one of the most creditable exhibits on the ground. It was uniform in every way and the standard was excellent. It was impossible to tell the difference between the entries from the mountain counties and those from the blue grass counties. The superintendent in charge of the Woman's Department stated that the exhibits in her department had improved 50% this year, due to the fact that the girls in the canning clubs were teaching their mothers better methods.

BOYS' PIG CLUBS.

A new and attractive feature at the Kentucky State Fair was the exhibit of pigs by the members of the first pig clubs of Kentucky.

An interesting feature was the exhibit of Moser brothers, two pig club boys of Jefferson county, who forcefully demonstrated the difference in feeding a balanced ration from that of the common practice of feeding "corn alone."

The boys took two pigs from a litter, and the father a third one. The three pigs were in the same pen. The father's pig weighed 95, the boys' pigs 220 and 215 pounds, respectively. The sons know it cost them $4\frac{1}{2}$ c a pound to produce their pigs; the father has no idea of the cost of the runt.

Gordon Nelson, Jr., another pig club boy, from Christian county, added to the honors of the club by taking the blue ribbon in the junior yearling sow class from the Poland China breeders with his club pig, after winning his class among the boys. Pig club boys had their separate classes, but were also allowed to enter against the farmer.

After several hundred dollars in cash prizes and cups were hotly contested for, all these hogs were sold at a premium to Louisville packers, with a few exceptions.

Not only were the pigs present, but a considerable number of the boys also. This year the State Fair Board sent the winner of the contest in each county to the Farmer Boys' Encampment. These boys, in addition to their instruction in this camp, competed for a handsome trophy and \$15 in cash given to the best judge of a ring of swine.

The Boys' Pig Club in Kentucky is organized by the Bureau of Animal Industry, in co-operation with the Bureau of Plant Industry and the Kentucky College of Agriculture, as a unit of the Farmers' Co-operative Demonstration Work. It is, therefore, part of the regular duties of the county agent, and is organized in counties having these county agents only.

BOYS' CORN CLUB DEPARTMENT.

There were over 100 entries in this department, from boys in 23 counties in the State. The corn was most excellent, and compared very favorably with the entries in the Men's Department. Every boy who entered an exhibit was required to have an expense account of his crop, showing what it had cost him per bushel to produce his corn. A prize was given to the best judge of corn, and 48 boys handed in essays stating the order in which they placed the exhibits they were given to judge, and their reasons for so placing them.

Department W, "The Girls' and Boys' Clubs Department," should be made one of the largest at the State Fair, and an entire building should be devoted to it. The girls and boys should be encouraged in every way possible to enter exhibits and take an interest in their department. Work of this nature will do much to build up the State Fair in the future.

GEOFFREY MORGAN,

State Agent, Farmers' Co-operative Demonstration
Work, U. S. Department of Agriculture.

THE WOMAN'S SHOP AT THE 1915 KENTUCKY
STATE FAIR.

The Woman's Shop was a new department of the Kentucky State Fair this year, 1915. The object of the shop was to create a market for the work of Kentucky women. Mr. J. W. Newman, Commissioner of Agriculture, Labor and Statistics, had seen the Porto Rican women at work on their beautiful drawn work, and he knew that it had a large sale throughout the States. He believed that the efforts of Kentucky women would be widely recognized and paid for, if their work could only be brought before the public in the proper way. The most natural way and the best way seemed to be the medium of the State Fair, where all home talent is displayed.

Commissioner Newman invited the following women to meet with him in Louisville: Mrs. Helm Bruce, Mrs.

Alfred Brandeis, Mrs. Morris Belknap, Mrs. Harry Bishop, Mrs. R. P. Halleck, and Mrs. S. Thruston Ballard. He laid his plans before these women, and asked their co-operation in forming a committee of women who would help advertise the Shop, explain its purpose to contributors and purchasers, and be present at the State Fair to assist in making sales. The idea of such a shop met with the enthusiastic approval of these women. They promised their assistance, and went to work at once, because they had only two days in which to secure members for the Women's Shop Committee, and get their names in the State Fair catalogue. I was made chairman of this committee, with the following members consenting to serve:

Mrs. J. A. Mitchell, Bowling Green.
 Mrs. Starling L. Marshall, Henderson.
 Miss Edna Dolfinger, Louisville.
 Mrs. Barbour Minnegerode, Louisville.
 Mrs. Avery Robinson, Louisville.
 Mrs. Leonard A. Hewett, Louisville.
 Mrs. Peter Lee Atherton, Louisville.
 Mrs. Richard Knott, Louisville.
 Mrs. Richard Ernst, Covington.
 Mrs. R. P. Halleck, Louisville.
 Mrs. W. L. Mills, Owensboro.
 Mrs. Anna Ernberg, Berea.
 Mrs. Helm Bruce, Louisville.
 Miss Amanda Rodes, Danville.
 Mrs. Harry Bishop, Louisville.
 Mrs. Alfred Brandeis, Louisville.
 Miss Mary F. Hutchcraft, Paris.
 Mrs. R. C. Ford, Middlesboro.
 Mrs. Sam Boyle, Louisville.
 Mrs. Paul Creel, Louisville.
 Mrs. T. J. Smith, Frankfort.
 Mrs. George A. Armstrong, Shelbyville.

A number of other women throughout the State helped the official Woman's Shop Committee in ascertaining the names of women in Kentucky who made beautiful things. A letter of explanation was drawn up by the Woman's Shop Committee, and mailed by the State Fair office to all these women, and to the women who had in former years sent articles to compete for prizes. All articles at the Woman's Shop were for sale, and not for competition for prizes. No commission or charge of any kind was made. The entire proceeds of the sales went to the makers of the articles.

Duplicate cards containing the name of the maker, and the price and description of the article were prepared to go on each thing in the shop. One of these cards was left on the article after it was sold, so that the purchaser could see who had done the work which she liked well enough to buy. In this way the women workers were advertised, and future purchasers knew where to go for various classes of goods.

All of the business of the Woman's Shop was attended to by the State Fair office. Efficient clerks, bookkeepers and cashiers received the articles, entered and marked them, returned them to their owners when they did not sell, handled all the money taken in, and sent the checks to the consignors for the full amount of their goods sold.

The Woman's Shop Committee arranged the space for the exhibit, displayed the articles, decided what proportion of each contributor's material could be placed in the cases each day, met the public to explain the worth of the shop, and assisted from early morning until late at night to make sales of everything sent in. The committee was divided into sub-committees. Each sub-chairman was given one day and one night for which she with her six workers was responsible. A considerable amount of friendly rivalry was thus aroused, because each chairman desired good business for her day and night.

On the thirteenth of September, when the doors of the fair opened, everything in the Woman's Shop was in perfect readiness. Shelves and cases were full. The wires above were hung with a wealth of quilts and counterpanes, appliqued and crocheted. Thousands of dollars were represented in these bedspreads alone, which ranged in prices from \$15 to \$250. The highest priced article in the shop was a lace dress valued at \$600. The sales, however, were not made from high-priced things. It was the articles costing from \$1 to \$25 that sold in greatest numbers.

Most of the articles were practical, and beautifully made, while many of them were rarely artistic. Certain things could have been disposed of again and again. The

public was surprised to find so many attractive things made in Kentucky.

In addition to the sales made during Fair week, there were orders taken for duplicates of things shown, and further orders have been received by the consignors since the Fair closed. The advertising feature, therefore, is at once proving to be of value. In the future consignors will know better what to send, because they will learn what is demanded by the buying public. Another benefit derived from the shop is the introduction to the Woman's Exchange belonging to the Business Women's Club of Louisville, where things are sold on commission. Several smaller towns also have exchanges, and still more were urged to start them.

There were 2,236 articles sent to the Woman's Shop this year. Of this number 363 were sold. The number of women who sent consignments is 414. They represented 100 cities in the State. The total sales amounted to \$583.

The large number of women who entered articles, and the size of the sales are most gratifying results for a first year. At the outset the Fair management figured upon receipts of \$400 as a possible maximum, whereas the final figures are nearly one-third more. The sales will increase greatly another year, because the public will understand that the Woman's Shop is a sales department, and will come prepared to buy.

MRS. S. THRUSTON BALLARD,
Chairman Woman's Shop.

GOOD ROADS EXHIBIT.

The Department of Public Roads and the Kentucky State Fair, in co-operation with the office of Public Roads of the National Government, placed on exhibit at the fair grounds during the fair week from September 13th to 18th, an extensive exhibit of road models and miniature machinery, which enlisted a great deal of interest from those who attended the fair for its educational advantages.

These models show in detail the proper methods of constructing all types of roads from the plain, common-place, ever day earth road, up through gravel construction, water-bound macadam construction, bituminous construction, and the construction of the highest and latest types of asphalt, brick and concrete surfaces. These models in themselves if carefully studied will furnish a foundation for some excellent road building ideas. In addition to this a number of bromide enlargements of pictures of good and bad roads were exhibited, and these pictures illustrated the improved conditions of communities along social, educational and commercial lines, through the improved conditions of their highways.

The people of Kentucky are to be congratulated on the fact that the co-operation between these departments rendered it possible for them to have the opportunity for studying this modern array of road building methods.

R. C. TERRELL,
Commissioner of Public Roads.

GIRLS' CANNING CLUB EXHIBIT.

The opportunities offered to members of the Girls' Canning Clubs by the State Fair of 1915, were large, and not possible from any other source. The exhibit of canned vegetables, fruit preserves and jellies, pickle and ketchup was a source of wonder and admiration to the thousands who passed through the Women's Building. This afforded the advertisement which we have so much needed, as a market for the girls' canning club product is the ultimate end of the waste product of garden and orchard. Some goods were sold from the exhibit, and many orders taken for next year's delivery. About one thousand cans of blackberries and huckleberries sent in by the girls of the mountain counties were sold from the booth.

The Commissioner of Agriculture offered a purse of \$30 to be competed for by the twenty-five organized counties. Mercer County secured first prize of \$15.00, McCracken County second prize of \$10.00, and Hardin County third prize of \$5.00. Competition in this class

produced the beautiful exhibit amounting to 1,263 jars. All jars and glasses were of uniform design, which added to the beauty of the exhibit.

The State Board of Agriculture not only was generous in awarding liberal premiums, but paid the express charges on the goods sent to this exhibit. This amounted to more than \$100. This assistance enabled us to send a large number of jars from each county, which together made one uniform exhibit.

In a small building on the fair grounds, a demonstration was made of some household conveniences, for the making of which the Home Demonstration Work provides bulletins or instructions. We hope to make this a large feature of our exhibit next year.

HELEN B. WOLCOTT,
State Agent Home Demonstration Work.

INOCULATION OF LEGUMES

It is a well established fact that many of the leguminous plants that can be grown successfully in Kentucky when inoculated with their individual bacteria, will not grow and gather nitrogen when not given an artificial inoculation. More failures in growing alfalfa are due to a lack of inoculation probably than from any other cause, unless it be from a failure to properly lime the soil. The necessary bacteria for the inoculation of red clover, white clover, alsike clover and soy beans seem to be generally spread over the lands in this State. Some experiments have shown that soy beans and cow peas will grow and make a fair yield of forage while they gather but little nitrogen to leave in the soil when inoculation is not practiced.

Realizing the virtue of inoculation, the State Department of Agriculture furnished inoculating material for experimental purposes, in order to get a few well inoculated fields in each community. The inoculation purchased by this Department and distributed free was for alfalfa and crimson clover, and the reports received at this office indicate the success of the undertaking. In fact, the results obtained have been so satisfactory, that it seems probable it would pay the Commonwealth to properly provide for the manufacture or growth of these cultures for free distribution. When it is realized a well inoculated acre of any one of several of these leguminous plants will produce from \$15 to \$25 worth of nitrogen in one season, while an acre without inoculation may make practically the same forage, but will leave but a few dollars worth of nitrogen in the soil, it is likely that some steps will be taken to provide the cultures so essential for nitrogen-gathering from the air.

The work of the experiment stations of the country has demonstrated the great value of bacteria of the leguminous plants in this work. It is simply a question for the Department of Agriculture to determine whether it is a judicious investment for the State to furnish sufficient cultures to give every farmer a start that will enable him to inoculate other fields with the soil of what

might be termed "the parent acre." The Department has this year sent out sufficient cultures for two hundred acres of alfalfa, and two hundred acres of crimson clover.

GARDEN CLUB WORK.

During the year 1914 the Garden Club work was continued in the city of Louisville, and the report published below of Mr. C. L. Clayton, Superintendent, indicates the scope of the work undertaken.

For the year 1915, it was deemed advisable, on account of many of the coal mines being closed down in eastern Kentucky, to devote the funds heretofore expended by the State in Garden Club work, in an effort to assist the miners out of employment.

The owners of the coal properties in most instances donated the land, and something over one thousand gardens were planted in Bell county at the different coal mines. These gardens, supervised by Mr. C. L. Clayton, who had been in charge of the work for the Department in Louisville for three years, were a revelation to the people in that section. The amount of vegetables produced was nothing short of phenomenal. The miners practically lived from their gardens during the summer months, and yet the surplus of vegetables was so great that a lady was sent with a canner to teach the Garden Club members how to can and preserve the vegetables for winter.

The results obtained by this work in the one county of Bell, indicates a great field for vegetable growing in the settlements around the various coal mines in Kentucky. Much of the work in the production of vegetables among the miners is done by the women and children, and simply adds the value of these vegetables to the income of the miner. No demonstration work the Department has undertaken has returned quicker or larger profit for the amount of money expended.

Louisville, Ky., April 15, 1915.

Mr. J. W. Newman,
Commissioner of Agriculture,
Frankfort, Ky.

My Dear Sir:

Enclosed find financial report of the Louisville Garden Club, also bills amounting to \$100.00, which are paid, and report of Mr. C. L. Clayton, Superintendent, for the year 1914.

We regret exceedingly not being able to get this report to you sooner, but on account of business have not been able to do so. It is needless to state that the Louisville Garden Club has done a great deal of good in Louisville, and the results are being shown this year in the great number of gardens started in the city, and the interest taken by the schools and school children; and will state that this year, on account of not having the necessary funds to engage a superintendent, prizes will only be given to the children; and we feel that the rough work of the club has been done during the last three years while Mr. Clayton was superintendent.

We certainly appreciate your kindness and the help given us, and also say the same for a great many others who have gardens, and are interested in the work, who never would have thought of this work except for your efforts in helping us. If there is any other information or explanation in regard to anything that you would like to have, we will be very glad to inform you.

We are also enclosing clippings of the last notice we had in the paper, and will state that during the year we had a great many of these clippings, and we are also giving stereopticon lectures, which work was carried on all last year in different parts of the city, and throughout the county. We do not expect to have the financial backing we had last year, on account of change of times, but we expect to raise enough to give the children substantial prizes.

Thanking you for your kindness, we remain,

Yours truly,

LOUISVILLE GARDEN CLUB,

(Signed) G. C. Blackman,

Treasurer.

P. S.—Blue ribbon prizes were also given.

REPORT OF C. L. CLAYTON, SUPERINTENDENT OF LOUISVILLE GARDEN CLUBS.

FOR THE SUMMER OF 1914.

The Louisville Garden Club was organized to create an interest in gardening among the children and adults of the city of Louisville, with the idea of making use of some of the vast amount of waste space which is scattered throughout the city. Many people in the city are paying out a large share of their earnings for food, when by the use of some of their spare time spent in raising a small garden, they could grow a very consider-

able amount of their own food, at least through the summer months. It was to bring this fact before the people that this club was organized. We have tried to show the people of Louisville how, by the use of a certain amount of industry and thrift, they could save a considerable amount of the money now paid out.

Many of the members of the club sold the vegetables which they raised, but this was not required of members, and in fact, most of the members used most of the produce they raised, selling only the surplus. We did not encourage children to plant vegetables for the money return they would get from them, except in special cases. In fact, I feel that the greatest benefits they received were in the way of added knowledge and self-reliance. We tried to see that the children did the work in such a way that they got pleasure as well as benefit from it. Thus the children measured their gardens for the planting, etc., and kept account of the yields. We also conducted two classes in the summer schools of the Second Presbyterian Church and the Cathedral House, each in connection with a garden.

I found that parents were glad to have their children belong to the club, because: (1) It kept the children off the streets; (2) kept them outdoors and also gave them some spending money.

Total number of gardens at end of season, 1914.....	984
Number of gardens having groups of children working (mostly on vacant lots).....	12
Number of children working in above 12 gardens.....	164
Total number of children and adults having gardens.....	1,148
Total number of instruction gardens used as central meeting places and being visited on an average of every twelve days	17
Some of the above gardens were visited weekly and some less often.	

Of the above gardens about 90% were vegetable or vegetable and flower gardens, about 10% being flower gardens only. The flower gardens were mostly located in the densely settled portions where space was limited.

Average size of garden was (over entire city).....	550 sq. ft.
Average size of garden in suburbs.....	1,400 sq. ft.
Average size of garden in city.....	200 sq. ft.
Average production of vegetables sold (estimate).....	\$ 3.00
Average production of vegetables, total value.....	10.50
Total value of vegetables raised by members.....	10,000.00

\$10,313.50

This estimate we believe to be conservative. This is, we think, only a small part of what the club has done for the city, as large numbers of people have been persuaded to plant gardens who do not belong to the club.

Respectfully submitted,
C. L. CLAYTON, Supt.

REPORT OF GARDEN CLUB WORK FOR 1915 IN BELL COUNTY.

The Garden Club Work was first begun in 1913 by J. W. Newman, Commissioner of Agriculture, in Louisville. At that time the Louisville Garden Club was organized to promote the planting of back yards and vacant lots in the city of Louisville. This work was continued under the direction of the department in 1914 with increasing success. In 1915 such impetus had been gained that without any State aid there were so many gardens planted throughout the city that they were a noticeable factor in lowering the price of garden products in the district.

In 1915 an offer was received from Dr. J. G. Foley, of Bell County, for a continuation of the work in the mining camps of that county. At this time the coal business was slack, mines were running only about one-half time, and the prospects were dark. Many of the miners were not working enough to enable the miners to earn living expenses, and unless they could get part of their living outside, they would have to be carried by the company. In view of these conditions it was decided to start the garden club work in Bell County.

In the spring, meetings were held in each of the thirty-two mining camps of the county under the direction of C. L. Clayton, the Supervisor sent by the State Department of Agriculture, who was greatly assisted by the hearty co-operation of Dr. Foley, the superintendents of the various mines and the camp doctors. At these meetings, conditions and prospects were explained and the miners were all urged to co-operate in planting and caring for a garden with the idea of having a "garden for every family." The movement was taken up with en-

thusiasm. The companies donated the use of land and the mules to prepare it for planting. Everywhere could be seen men, women and children, fencing plats around houses, preparing the ground, picking up stones, and in many cases where ground was scarce, clearing up a field of new ground on the mountain side near the camp. In some places the ground was so rocky it could not be plowed, but had to be dug up with a pick, and the rocks thrown out in large piles or used to fence in the garden. In spite of all difficulties, the work progressed rapidly, so that in one month after work was started, practically all the ground in and near the camps, which before had been waste land, unfenced and covered with empty cans and weeds, was now fenced, cleaned up and planted in vegetables. In some places this was extended even to the top of the mountain, and instead of one garden to a family, in many cases there were two, one at the house for small products and another on the mountain for large products. The latter was in many instances of eight or ten acres in extent. In the camps alone there were planted a total of 2,600 gardens. For the first time in the history of the mining camps, they were growing their own vegetables and instead of buying all their produce, had a surplus of some things.

The question of using this surplus was discussed at meetings and it was decided to can it in glass and tin cans for winter use. Several of the gardeners bought home canning outfits, others used lard cans and kettles. Circulars were distributed over the county and canning demonstrations were held at various points where the best methods were shown. Mr. Galoway, of Pineville, canned over 1,100 cans of string beans, tomatoes and cabbage and others canned corresponding amounts.

At the close of the season it was estimated that there were in the camps about 2,400 gardens, the decrease being due to various causes, prominent among which were washouts due to the low situation of many of the gardens. Local people claimed that there was four times the amount of gardening in the county than ever before and as this increase was largely in the mining camps, it was very noticeable.



A city garden in Garden Club work.



Mountain garden, in Garden Club work.



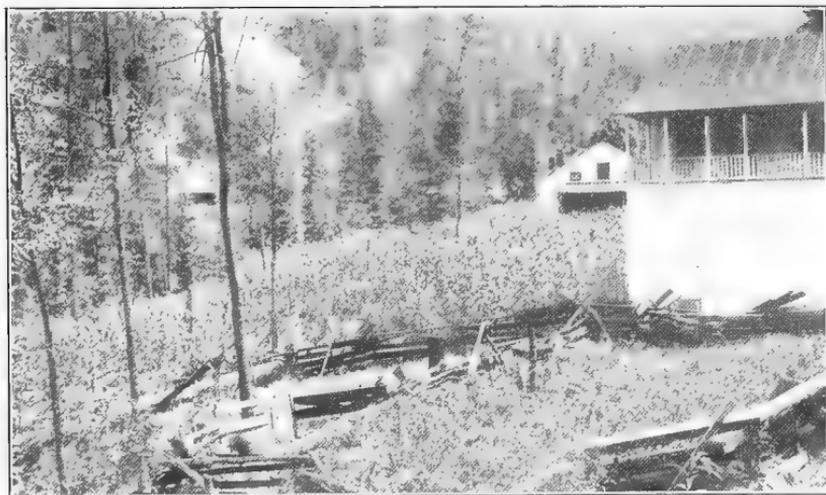
A mountain garden before planting.



A mountain garden after planting.



A mountain garden before planting.



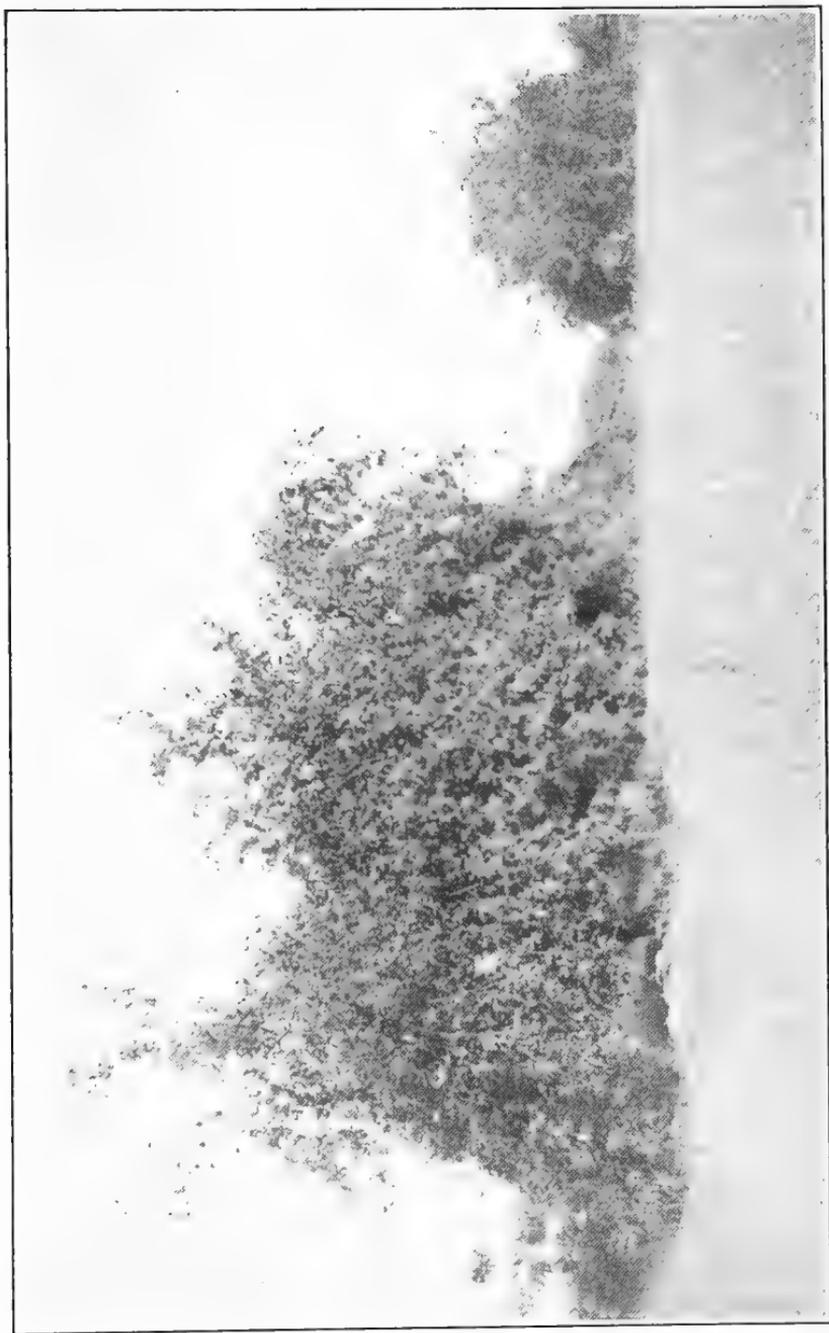
A mountain garden after planting.



Attending Farmers' Institutes under difficulties.



Mountain Orchard.



Demonstration Orchard, Hardin County.



Pruning demonstration.



Four-year pears—Rowan County.



Apples—Rowan County.



Three-year Early Elberta Peach—Rowan County.



Demonstration Orchard, Hardin County.

The camps at Straight Creek and Fonde took especial interest in the movement and were well rewarded by the crops they raised. However, the other camps were not far behind. It was evident to all who saw the results, that the effort had been very much worth while.

DEPARTMENT OF AGRICULTURE

RECAPITULATION ALL FUNDS SIX MONTHS ENDING
DECEMBER 31, 1915.

APPROPRIATIONS.

Bureau fund	\$ 13,000.00	
State Board fund	20,000.00	
Educational fund	5,000.00	
Demonstration fund	5,000.00	
	<hr/>	
Total appropriations	\$ 43,000.00	
Live Stock Sanitary Board (gen- eral fund)	522.12	
	<hr/>	
Total to be accounted for.....		\$ 43,522.12

EXPENDITURES.

Bureau fund	\$ 6,164.67	
State Board fund	10,428.62	
Educational fund	1,414.98	
Demonstration fund	3,086.53	
	<hr/>	
	\$21,094.80	
Live Stock Sanitary Board (gen- eral fund)	522.12	
	<hr/>	
Total Expenditures		\$ 21,616.92
		<hr/>
Balance December 31st, 1915.....		\$ 21,905.20
As follows:		
Bureau fund	\$ 6,335.33	
Educational fund	3,585.02	
Demonstration fund	1,913.47	
	<hr/>	
	\$ 12,833.82	
State Board fund	9,571.38	
	<hr/>	
		\$ 21,905.20

B. PERRY WEAVER,
Public Accountant.

STATEMENT BUREAU FUND.

July 1, 1915—December 31, 1915.

Bureau fund appropriation..... \$13,000.00

EXPENDITURES.

Labor Department expense.....	\$2,145.42	
Stationery and printing.....	191.42	
Office supplies and expenses.....	119.41	
Office equipment	136.59	
Postage	300.00	
Telephone and telegraph.....	40.95	
Express, freight, hauling.....	16.95	
Salaries	2,589.98	
Special premiums	400.00	
Traveling expense	76.21	
Miscellaneous	29.40	
Community poultry breeding.....	118.34	
		<hr/>
Total Expenditures		6,164.67
Balance December 31, 1915.....		<hr/> \$6,835.33

STATEMENT STATE BOARD FUND.

July 1, 1915—December 31, 1915.

State Board fund appropriation..... \$20,000.00

EXPENDITURES.

Expense State Board meetings.....	\$1,396.90	
Farmers' Institutes	4,190.95	
Immigration	1,044.20	
Office supplies	2.45	
Postage	50.00	
Telephone and telegraph.....	169.41	
Express, freight, hauling.....	51.01	
Salaries	1,950.00	
Traveling expense	21.35	
State veterinarian and assistants & L. S. S. B. Exp.	1,395.10	
Hog cholera eradication	90.00	
Miscellaneous	67.25	
		<hr/>
Total Expenditures		10,428.82
Balance December 31, 1915.....		<hr/> \$9,571.38

BUREAU OF AGRICULTURE.

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STATEMENT EDUCATIONAL FUND.

July 1, 1915—December 31, 1915.

Educational fund appropriation \$5,000.00

EXPENDITURES.

Corn clubs	\$ 35.00
Canning clubs	681.34
Garden club	352.72
Express, freight, hauling.....	50.92
Postage	100.00
Miscellaneous	195.00

Total Expenditures	1,414.98
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Balance December 31, 1915.....	\$3,585.02
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STATEMENT DEMONSTRATION FUND.

July 1, 1915—December 31, 1915.

Demonstration fund appropriation..... \$5,000.00

EXPENDITURES.

Silo construction	\$ 814.04
Telephone and telegraph	9.95
Miscellaneous	200.00
Orchards	633.38
Nursery stock inspection.....	182.49
Rock crusher	1,189.22
Quarantine expense	57.45

Total expenditures	3,086.53
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Balance December 31, 1915.....	\$1,913.47
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STATEMENT LIVE STOCK SANITARY BOARD.

July 1, 1915—December 31, 1915.

Expenditures charged to general fund. No appropriation.

EXPENDITURES.

State Board meeting.....	\$505.48
Stationery and printing.....	5.25
Miscellaneous	9.76
Telephone and telegraph.....	1.63

Total Expenditures	\$522.12
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PART THREE

PAPERS, BULLETINS, ADDRESSES

PAPERS, BULLETINS, ADDRESSES

SOIL FERTILITY.

The subject of soil fertility touches the fundamental basis of agriculture. The system of farming that does not take into consideration the increase and maintenance of soil fertility is failing to a greater or less extent. The State Department of Agriculture, in its institute work and in every way, has endeavored to emphasize the necessity of a rational system of farming, that would preserve the fertility of the soil so far as is possible. The work of the Kentucky Agricultural Experiment Station along soil fertility lines has been thorough and has attracted attention throughout the country. In fact, the teachings of the station have brought forth some unjust criticisms from certain parties interested in the sale of commercial fertilizers. In the last bulletin of this department we did not hesitate to condemn the miscellaneous use of complete fertilizers. We again want to emphasize that much of the money spent in this way by the farmers is wholly or partially lost.

The following amounts of fertilizers, as reported by the Kentucky Agricultural Experiment Station, have been sold in Kentucky within the last few years:

1908	35,000 tons
1909	43,000 tons
1910	57,000 tons
1911	63,000 tons
1912	65,000 tons
1913	75,000 tons
1914	80,000 tons

The cash value of these fertilizers figured at \$20.00 per ton has reached the total of at least one million and a half dollars expended by the farmers of Kentucky for commercial fertilizers.

The teachings of this bulletin No. 191 show that a great amount of this million and a half dollars annually could be saved by the farmers by the use of acid phosphate, raw rock phosphate, or basic slag and limestone followed by leguminous crops. Of such importance, in our opinion, is this bulletin to a thorough knowledge of the basis of soil building that we have asked the privilege from the Experiment Station to here reproduce it, and we hereby give credit to Dr. Joseph H. Kastle, Director of the Station, and to Prof. George J. Roberts, to whom all credit is due for this publication.

BULLETIN No. 191.

THE TEACHINGS OF THE KENTUCKY AGRICULTURAL EXPERIMENT STATION RELATIVE TO SOIL FERTILITY.

INTRODUCTION BY JOSEPH H. KASTLE, DIRECTOR.

There was a time in the earlier years of the work of the Kentucky Agricultural Experiment Station when considerable attention was paid to the study of the effect of commercial fertilizers on the growth of certain crops, such as hemp, potatoes, corn and tobacco, the results of which seemed to indicate that considerable financial returns followed the application of such materials to the soil; and upon a piece of poorly drained, wet, crawfishy soil on the Experiment Station farm, the studies of Drs. Scovell and Peter indicated considerably increased yields of corn, hemp and potatoes following the application of potash salts. In the year 1909, however, in a bulletin entitled "Fertilizers," by Professor Roberts, it was pointed out first, that the farmer was paying for phosphoric acid, nitrogen and potash in mixed fertilizers a great deal more than these materials were worth and a great deal more for each of these as constituents of complete fertilizers than the prices at which they could be bought separately, and that the lower the grade of commercial fertilizers, the higher the price charged per pound for these several elements of plant food. This bulletin also contained a section on the general subject

of soil fertility and pointed out how, in many instances, through improper systems of cropping, failure to use legumes and cover crops, and how by failure to return to the soil the manurial equivalent of the crops removed, and how through leaching and the burning out of humus, the soils of the State were becoming unproductive. It was further pointed out in this bulletin that while commercial fertilizers have their place in agriculture, we cannot make them our sole or chief dependence in maintaining soil fertility. If a soil is deficient in phosphoric acid or potash, or both, then phosphates or potash, or both, should be bought as needed. As a rule, nitrogen should not be bought, but should be returned to the soil in farm manure and produced by the growing of leguminous crops. The practice of buying complete fertilizers, without any consideration of the deficiencies of the soil, is very wasteful.

“Small applications of commercial fertilizers may, and do sometimes, prove profitable, but it is because they supply a small amount of readily available plant food at the beginning of the growing period, thus stimulating the plant and making it more vigorous, and, therefore, more able to draw upon the soil for its food. But the farmer should not deceive himself in believing that the fertilizer used has fed his crop. It has caused the plant to draw more heavily upon the soil and exhaust it more rapidly. This is the real reason for the belief that commercial fertilizers injure the soil. The small applications of fertilizers commonly used will, as a rule, give more profitable results on good soils than on poor ones. Although commercial fertilizers may be used, the farmer should not for an instant neglect the care of farm manure, the growing of leguminous crops, and the practice of adequate crop rotation.”

“Then the functions of commercial fertilizers are, first, to supply a deficiency or deficiencies, and, second, to strengthen the plant at the beginning of the growing period. It is, therefore, important for the farmer to determine by field tests just what the fertilizer requirements of his soil are.”

This bulletin also outlined a plan for determining the fertilizer requirements of a given soil by a system of ex-

perimental plots, and on the basis of such tests it was recommended that "If the results of the tests show, for example, that only phosphoric acid is needed, then only phosphates should be bought. If only potash salts show a material increase in production, then buy only potash salts. In other words, supply only what the tests show is needed. However, if it is found that nitrogen is needed, then the profitable thing to do is to supply it in manure and legumes. Soils cannot be kept profitably productive by depending alone upon the ready-mixed, complete fertilizer."

And in this same connection it was pointed out that "there can be no doubt that large sums of money are annually wasted in this State by buying fertilizers containing low percentages of nitrogen and potash. These small percentages add a great deal to the cost of the fertilizers and do not give returns at all commensurate with their cost. * * * Ten times our annual expenditure could profitably be made for fertilizers, but it should be made in general for phosphate and potash salts to supply deficiencies and to use in the growing of leguminous crops to furnish humus and nitrogen. Our fertilizer manufacturers need to recognize the truth of this statement and begin at once to supply these materials in unmixed condition to farmers at the lowest prices possible."

The practice of selling low grade fertilizers under a great variety of brands was condemned as misleading to the farmer, and the suggestion was made that it would be eminently fairer to the purchasers of commercial fertilizers for the manufacturer and dealer to quote pound prices on each of the several sorts of plant food contained therein.

This bulletin also contained a section on the value and care of farm manure and called attention to the enormous waste of this valuable material in our agriculture. Lastly, it contained a section on green manure crops, in which there was pointed out the value of cover crops and leguminous crops, the latter as sources of humus and nitrogen, and methods of handling the same.

This bulletin, published in 1909, forms the basis of the later and more recent teachings of the Kentucky

Agricultural Experiment Station regarding the proper maintenance of soil fertility and the more rational and sensible use of fertilizers and the principal sources of plant food. I cannot find in our more recent bulletins and circulars anything that in essence, at least, was not set forth in this Bulletin No. 140. Dr. Hopkins' epoch-making book entitled "Soil Fertility and Permanent Agriculture," which appeared in 1910, presents at greater length and in a more detailed way essentially the same ideas that are contained in our Bulletin 140, and, in my opinion, all of our later day teachings in this State respecting soil fertility, and the general subject of soil amendments are traceable to these two publications and to the work of the Ohio Experiment Station. Since that time, Professor Roberts, as agronomist of the Experiment Station, has enlarged somewhat on these ideas in his publications and lectures. The essential facts, however, are the same. These ideas have been confirmed by his recent work on a number of experimental fields in various localities throughout the State. As far as I am able to gather from his writings and utterances, his belief is:

First. That no system of cropping should be followed that will continually remove from the soil the elements of plant food without the return to the soil of crop residues and manure made by feeding the crops removed or without a systematic rotation containing leguminous crops and cover crops.

Second. That practically all of the soils of the State contain inexhaustible quantities of potash, which through the maintenance of the humus content of the soil can be brought into available form sufficiently rapidly to meet the potash requirements of farm crops.

Third. That with the exception of the soils of the Blue Grass region, the soils of the State are deficient in phosphorus and that, therefore, this element should be supplied in most instances most advantageously in the form of acid phosphate until organic matter is restored to the soil, after which rock phosphate may be used.

Fourth. That the farmers of the State cannot afford, in most instances, to buy nitrogen, but must obtain this important element along with humus, by returning

to the land the farm manure equivalent of the crops removed and by the cultivation of leguminous crops, and the use of catch crops, cover crops, and crop residues.

Fifth. That the use of complete fertilizers is neither economical nor is it conducive to a condition of permanent soil fertility for the reason that the apparent good results obtained following the use of such soil amendments are frequently due to stimulation of plant growth which results in the removal from the soil of an excess of plant food, thereby leaving the soil in a more depleted condition than it was previous to the application of the fertilizer.

Sixth. If the plot tests, or the results obtained on an experimental field or the chemical analysis of the soil indicate a deficiency of potash or phosphoric acid in any soil, then these elements, one or both, must be supplied in the cheapest available form and in quantities sufficient to meet the food requirements of a number of crops. The soils of Kentucky outside of the Blue Grass region are deficient in phosphorus as shown by chemical analysis, plot tests and experiments on our experimental fields, a fact that explains the use of increasing amounts of acid phosphate in various counties of the State. In order to obtain any one of these plant foods, the farmer should not be compelled nor encouraged to buy other plant foods that he does not require.

Lastly, I may say that these have been the teachings regarding soil requirements and the use of soil amendments endorsed by the Kentucky Agricultural Experiment Station and by other experiment stations and by prominent agronomists generally for the last five or six years. As director of the Kentucky Agricultural Experiment Station, I am glad, therefore, to lend my endorsement to the teachings set forth by Professor Roberts in this bulletin. In fact, I can heartily commend this bulletin to the farmers of the State and to those who may be interested in our agricultural prosperity as being decidedly the most scientific and helpful publication ever issued by the Kentucky Agricultural Experiment Station on the general subject of soil fertility and the rational use of soil amendments.

THE TEACHINGS OF THE KENTUCKY AGRICULTURAL EXPERIMENT STATION RELATIVE TO SOIL FERTILITY.

BY GEORGE ROBERTS, AGRONOMIST.

The requirements for a productive soil are:

1. Good drainage.
2. Good texture.
3. Sufficient supply of plant food.
4. Sufficient organic matter (humus).
5. For its highest productiveness, carbonate of lime.

From the foregoing statement it will be seen that not all the emphasis is by any means laid upon plant food. However, if all the conditions for a highly productive soil exist save a sufficient supply of plant food, the soil will not produce maximum crops.

With all other conditions favorable for maximum production, a soil will be limited in production by the available supply of the most deficient element of plant food. For example, if all the elements were present in available quantities sufficient to produce 100 bushels of corn per acre, save one element, say nitrogen, and the available supply of this element were sufficient for only 25 bushels, then the yield could not be raised beyond 25 bushels without the addition of more nitrogen. In other words, a soil is no more productive than its most deficient element permits it to be. The deficiencies of a soil, and not the crop growing on it, become the chief factors in determining the fertilization that shall be employed. In a word, the basis of increasing and maintaining the fertility of a soil consists in supplying in the most profitable form and amount, those elements the total amounts of which are shown to be too small for the most profitable production, and in adopting means for making available those other elements that are shown to be already present in large amounts.

Most of the soils of the State possess all the requirements for producing fair to large yields except phosphorus, lime, and organic matter (humus), which supplies nitrogen. That is to say, most of the soils are normal. By a normal soil is meant one containing the plant

food elements in somewhat the same relative proportions as found in the general composition of the earth's rock crust. This embraces about all soils except sandy, muck, and peat soils, which are found in this State in comparatively limited areas.

Crops are composed chiefly of ten elements of plant food, all of which are absolutely essential to plant growth. Some other elements occur incidentally in plants, but are not believed to be essential to growth, and in any case the soil contains sufficient quantities of them, so they may be left out of this discussion.

The ten essential elements are carbon, hydrogen, oxygen, nitrogen, calcium, magnesium, iron, sulphur, phosphorus and potassium. Carbon, hydrogen and oxygen constitute about 95 per cent. of the dry weight of crops. The supply of carbon and oxygen is obtained from the carbon dioxide of the air and is not under human control. Hydrogen is obtained from water.

Nitrogen is obtained entirely from the soil by all non-leguminous crops (corn, wheat, oats, grasses, tobacco, etc.). Inoculated legume crops (clovers, peas, beans, vetches, alfalfa, etc.) obtain their nitrogen from the air whenever the soil supply is insufficient.

All the other elements are obtained from the soil by all plants. Of these, calcium, magnesium, iron and sulphur are generally considered to be present in the soil in sufficient quantities for maximum production. At least, they may be assumed to be for the purpose of this discussion, for the fertilizer trade is concerned only with supplying phosphorus, potassium and nitrogen in fertilizers and prices are made on the basis of the content of these elements.

Manufacturers of complete fertilizers commonly assume a deficiency in the soil of an available supply of all three of these elements. As to the deficiency of phosphorus and nitrogen in most soils, we can readily agree, for both chemical analyses of soils and field tests support this conclusion. As to the deficiency of potassium in most soils, we cannot agree. Both chemical analyses and field tests show normal soils to contain sufficient potassium for very large or maximum yields, provided the content of organic matter is kept up to the necessary

standard for a productive soil. Unless organic matter is maintained, soils cannot be kept productive, even with a liberal use of all the ingredients of the so-called complete fertilizers, for organic matter has many other important functions necessary to a productive soil besides supplying and liberating plant food.

The following table shows the average content of potassium and phosphorus in the main soil areas of the State. The figures represent pounds of the elements in 2,000,000 pounds of soil, or an acre to the depth of about seven inches:

Number of Pounds of Potassium and Phosphorus in 2,000,000 Pounds of Surface Soil (0-7 Inches) in the Main Soil Areas of Kentucky.

AREA	Total Potassium	Easily soluble Potas.*	Total Phos.	Easily soluble Phos.*
Trenton	26278	329	9416	3582
Cincinnatian	31960	366	1924	59
Silurian and Devonian.....	23940	224	1100	20
Waverly	19600	338	650	14
St. Louis	28220	320	890	18
Chester	26560	218	702	6
Western Coal Field.....	29290	276	766	19
Eastern Coal Field (Western part)	18180	272	630	13
Eastern Coal Field (Central and Eastern part).....	34213	360	1260	46
Quaternary	30926	300	980	26
River Alluvium	34430	390	1910	98

*Soluble in fifth normal nitric acid. (A very weak solution.)

For the location and extent of the above areas see bulletin entitled "The Soils of Kentucky," by S. D. Averitt. (In press.)

It will be seen that all the soils of the State contain large amounts of potassium, the lowest amounts being found in the Waverly and the western part of the Eastern Coal Field. It will also be noted that the amounts of easily soluble potassium contained in the soils of the various areas do not differ greatly. While it is not contended that the amount of easily soluble potassium represents the amount available to the crop, yet there is a re-

lation between availability and solubility. (See bulletin above mentioned.)

Hopkins, in his "Soil Fertility and Permanent Agriculture," makes the statement that, under good farm practice, roughly an amount of potassium equal to one-fourth of one per cent of the amount contained in the surface seven inches becomes available in a growing season. On this basis nearly all Kentucky soils contain enough potassium for very large or maximum yields of crops. For example, one hundred bushels of corn, including the stover, require 70 to 75 pounds of potassium.

On the average, three-fourths of the potassium required to produce the grain crops is in the straw and stalks. Nearly all the potassium in the feed given animals is returned in the manure. Hence with either live stock or grain farming, if the supply of organic matter is kept up by the return of the crop residues and manures, most of the potassium used by crops finds its way back to the soil, and is readily available itself, while the decay of the organic matter returned liberates more from the minerals of the soil.

Let us see if field tests show what the potassium content of the soil would lead us to expect. On a limestone clay soil at Burnside, Pulaski county, Kentucky, where we have been conducting experiments for six years, the following results have been obtained:

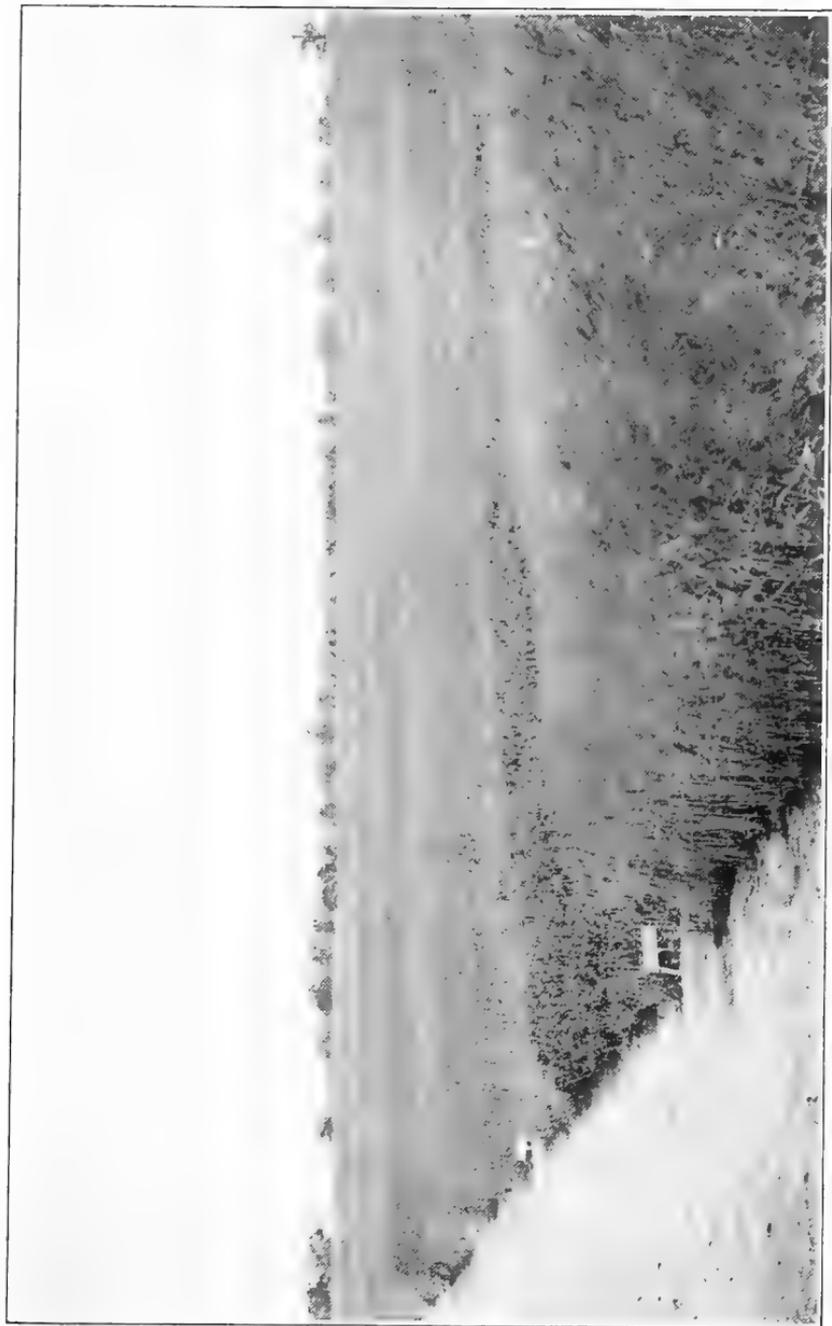
Yields Per Acre—Burnside Experiment Field.

Plot No.	Treatment.	Corn, 1909, Bushels.	Oats, 1910, Bushels.	Clover 1911, Pounds.	Corn, 1912, Bushels.	Soy Bean Hay, 1913, pounds.	Wheat, 1914, Bushels.	Cost of Fertilizers Per Acre.	Value of Crops	Net value of increased Yields.
1	Rock Phosphate and Potash.....	3.8	9.3	2436	32.9	1688	11.9	\$26.10	\$61.20	\$10.37
2	Nothing	9.0	9.0	668	9.5	628	2.5	0.00	24.73	0.00
3	Acid Phosphate and Potash.....	14.3	11.9	2168	45.7	2272	19.2	25.19	\$4.68	\$3.55
4	Acid Phosphate	17.7	13.6	2328	43.5	2112	18.1	5.60	\$5.09	\$0.76
5	Nothing (See explanation)	20.4	14.0	1292	30.3	1176	5.1	0.00	\$5.42	0.00
6	Potash	11.9	10.5	764	17.6	560	1.7	16.50	31.37	-9.86

This soil contains 12500 lbs. of potassium per acre 7 inches, which is about half the average for the State.



Pearl Millet.



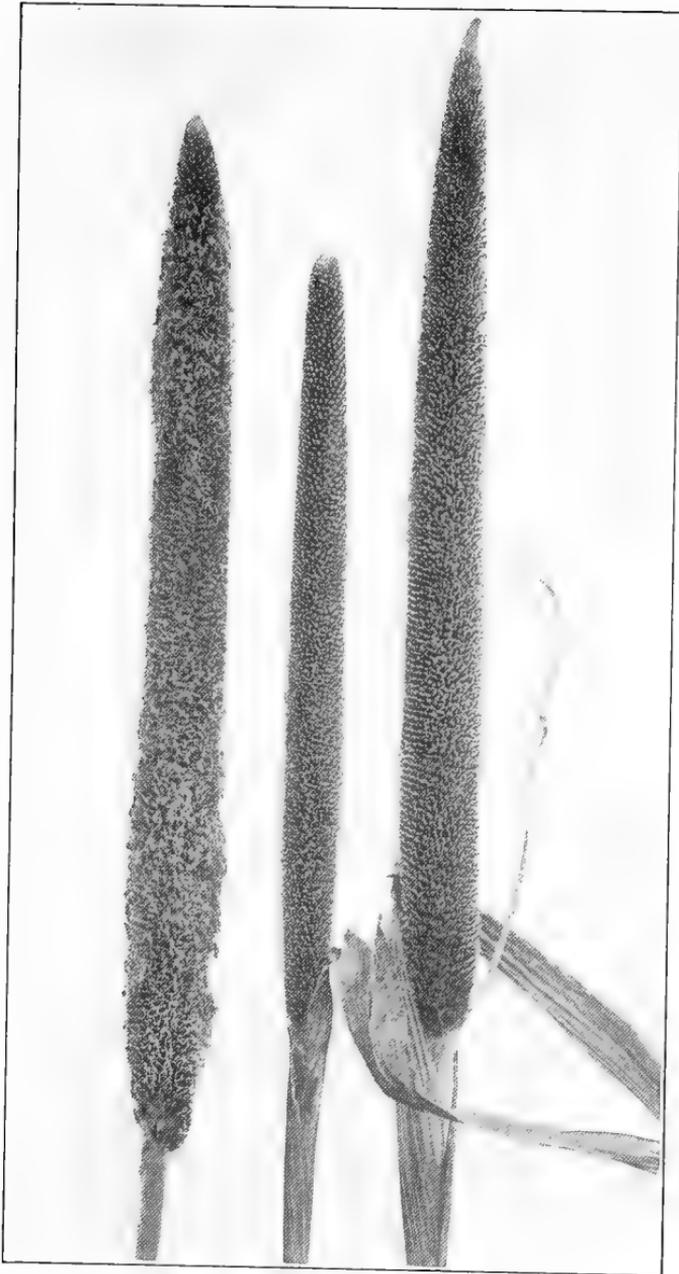
Experimental forage plots Division of Entomology and Botany, Kentucky
Experiment Station.



Hairy Vetch.



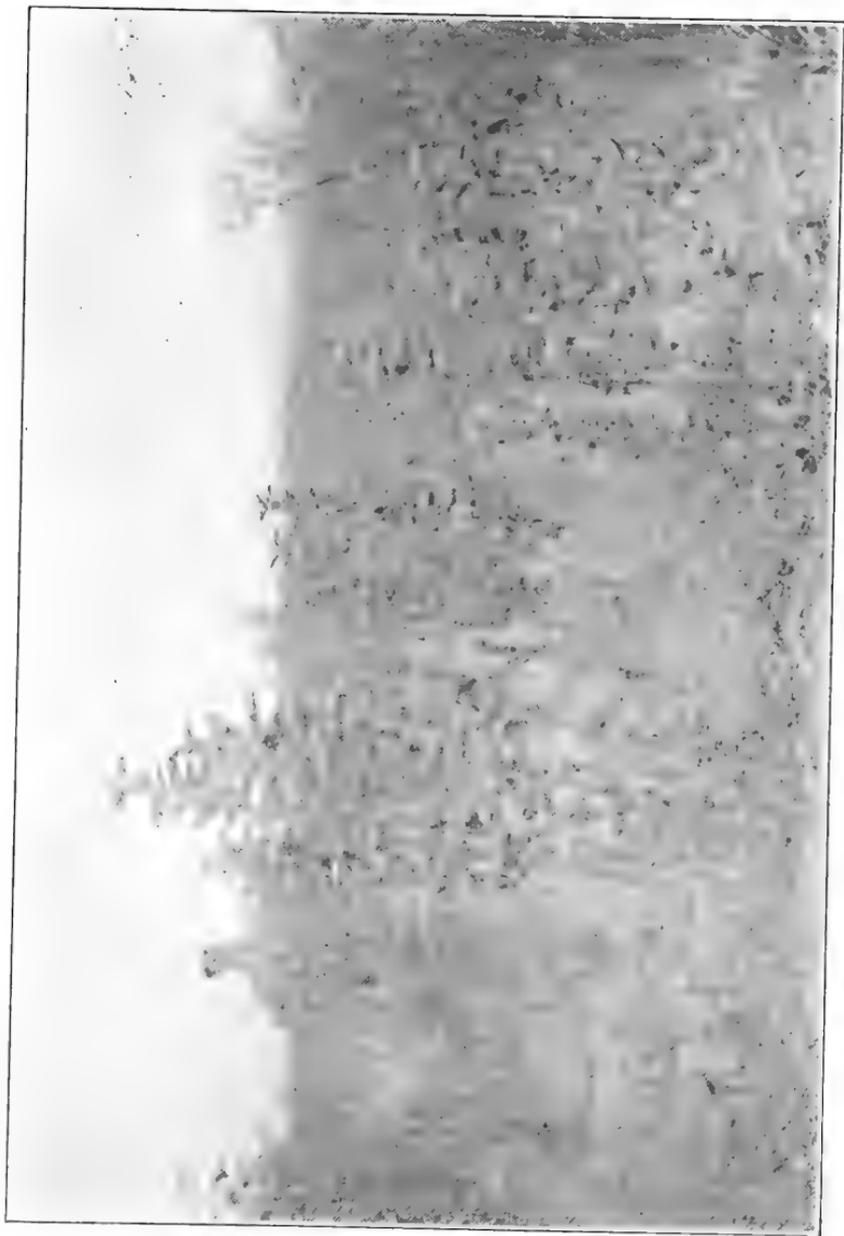
English Blue-grass.



Pearl Millet.



Bermuda Grass Plot.



Root Grass Planted Spring, 1915. Notice Some of These Trees Have Attained a Height Higher Than a Man in One Season.



Three-year-old Stayman Wine Sap, Planted November, 1912.
(See page 140.)

Let it be understood also that this soil was extremely deficient in organic matter in the beginning of the experiment. The ground was badly worn and had not for many years produced a crop that paid for the labor put upon it. In 1908 it made less than 3½ bushels of wheat per acre with the use of 200 lbs. per acre of a 2-8-2 fertilizer, the year being favorable for wheat.

Plot No. 5 is not to be considered a check plot. It is a low piece of ground that has for many years been receiving washings from the ground around it, and is naturally more productive than the other plots. It is included to show that the poorer ground by proper treatment can be made to surpass it in fertility. There was a slight increase in natural fertility from plots 1 to 4, inclusive, the greatest variation being in plot 1. There was not a great deal of difference in plots 2, 3, 4 and 6.

In calculating values corn is rated at 60 cents per bushel, wheat at 90 cents, oats at 40 cents, and all hay at \$12 per ton. Stover and straw are not included in the valuations. Stable manure was returned to the soil in the equivalent of the crops each treatment produced. In all other particulars the plots were handled in a uniform manner, including cultivation, catch crops and cover crops.

While there is seemingly a slight increase in yields in some cases where potash* was used, yet it is not sufficient to justify the use of it.

The argument is sometimes advanced that acid phosphate sets free potassium in the soil, thus showing the need of adding potash. If acid phosphate does this, as it very likely does, it certainly is an argument against the investment of money in potash fertilizers when acid phosphate is used.

*The seemingly interchangeable use of the terms "potassium" and "potash" may appear awkward, and may confuse persons without chemical training. The soils laboratory of the Experiment Station uses "potassium" in reporting soil analysis, while the fertilizer laboratory uses the term "potash." In this bulletin we have used "potassium" in discussing it as an element of plant food in the soil and crop, while "potash" is used in referring to fertilizers and materials furnishing the element "potassium." In like manner "phosphates" is used on the one hand and "phosphoric acid" and "phosphates" on the other.

On an experiment field at London, Laurel county, Ky., the following results have been obtained:

Yields Per Acre—London Experiment Field.

Treatment	Corn—Bushels					Wheat—Bushels			
	1911	1912	1913	1914	Ave.	1912	1913	1914	Ave.
Nothing	13.7	20.7	13.3	20.6	17.1	6.7	2.2	0.8	3.2
Acid Phosphate	25.1	22.3	14.6	47.7	27.4	11.2	5.2	4.0	6.8
Acid Phosphate and Limestone.....	38.9	51.9	24.1	48.0	40.7	13.1	10.3	7.0	10.1
Potash	12.3	23.6	14.6	21.3	18.0	5.7	1.5	0.7	2.6
Acid Phosphate and Potash.....	31.7	37.0	22.1	54.6	36.4	13.3	11.7	3.3	9.4
Acid Phos., Pot. and Limestone.....	29.9	42.3	18.7	53.1	36.0	13.5	7.7	10.8	10.7

Yields Per Acre—London Experiment Field—Continued.

Treatment	Pounds Soy Bean and Cowpea Hay				Lbs. Clov. Hay	Yield of Crops	Cost of Fertilizers	Net Value of Increase
	1912	1913	1914	Ave.				
Nothing	950	1100	1540	1197	290	\$72.99		
Acid Phosphate	1970	1340	1640	1650	860	119.04	\$17.60	\$28.45
Acid Phosphate and Limestone.....	4100	3030	2510	3213	3300	202.74	35.20	94.55
Potash	1300	2000	1540	1613	170	80.25	30.25	22.99
Acid Phosphate and Potash.....	4630	2140	1810	2860	1740	174.63	47.85	53.79
Acid Phos., Pot. and Limestone.....	4400	1880	1990	2757	2290	178.56	65.45	40.12

*Loss.

This field is located at the base of the coal measures in the western part of the Eastern Coal Field, and represents a limited area of agricultural lands. This soil contains 17,600 lbs. of potassium in the first 7 inches of an acre.

It will be observed that potash alone gave practically no increase in most cases, that acid phosphate and potash gave a more profitable increase than acid phosphate alone, but that by far the most profitable increase was by the use of limestone and acid phosphate. Unfortunately, the acid phosphate-lime-potash plots are on thinner ground than the others, and it remains yet to be seen whether potash will put them ahead of acid phosphate and limestone.

These results lead one to suspect that the effect of potash on the acid phosphate-potash plots may be due to the potash rendering the phosphate more available.

No one can doubt that phosphorus is the first limiting element in this soil. Limestone has rendered the phosphate more effective on the corn crops which were grown before legumes in the rotation. On a soil like the one at London I would unhesitatingly recommend the use of phosphate and limestone for the permanent improvement of the soil. It may prove to be desirable to use potash along with the phosphate when limestone cannot be used, as these results seem to indicate, although it must be stated that the acid phosphate-potash plots are on the naturally best soil of the field. However, I do not hesitate to say, as I have frequently said, that carefully conducted experiments may show the need of the regular use of potash on this soil, although I am yet in doubt in the matter. These experiments have not yet gone far enough to restore organic matter to the soil, as practically no manure has yet been returned. If potash is shown to be necessary on these soils, then I shall recommend its use as strongly as at present I recommend phosphates and limestone, but only in connection with a liberal use of phosphates.

On the Lexington soil experiment field which has been in operation four years and from which we have obtained 4 corn crops, 3 soy bean crops and 2 wheat crops, the average total production per acre of these 9 crops for all plots where potash has been used either alone or in combination with limestone and acid phosphate, is 281 bushels, and for similarly treated plots except for potash, the yield is 283 bushels. These averages are made up from 72 yields extending over a period of four years. One clover crop from this field shows an average yield of clover hay of 3,845 pounds per acre on all plots receiving potash either alone or in combination with limestone and acid phosphate, while plots similarly treated except for potash show an average yield of 3,817 pounds. No commercial nitrogen was used in these tests, but that nitrogen was not a limiting element before potassium is shown by the fact that potash gave no increase in clover and soy beans, which are not limited in their growth by the lack of nitrogen in the soil.

In passing, we may say that phosphorus and limestone were also without results on these crops on this soil.

In 1912-13 we conducted an extensive series of fertilizer experiments on wheat sown on corn ground on the Experiment Station farm. We used a complete fertilizer made as follows:

72 lbs. acid phosphate, furnishing 10 per cent. phosphoric acid.

8 lbs. sulphate of potash, furnishing 4 per cent. potash.

10 lbs. dried blood	} furnishing 3 per cent. nitrogen.
10 lbs. nitrate of soda	

100 lbs.

This fertilizer was used at the rate of 100, 200, 300 and 400 pounds per acre, each rate of application being repeated on three different plots. Another fertilizer was made containing the above amounts of nitrate of soda and dried blood, but dry soil was used to replace the acid phosphate and potash. This was applied at the same rates, and repeated as above, all applications being made when the wheat was sown. This gave 24 fertilized plots. The average yield of all these plots was 21.4 bushels per acre. Six plots were left untreated, the average yield of which was 21.4 bushels per acre. Three plots were treated with only nitrate of soda as a top dressing in the spring at the rate of 100 lbs. per acre. This gave an average yield of 31.9 bus. per acre, an increase of 10.5 bus. per acre. Phosphorus and potassium gave no increase and the fall application of nitrogen gave no increase. This is a fair basis for not recommending the use of fertilizer containing nitrogen on fall sown grain. This and other data presented are a safe basis for the conclusion that on the highly phosphatic, well-drained soils of Central Kentucky the application of phosphates and potash is not profitable.

The loss of nitrogen applied to fall sown grain is confirmed by an experiment on the Russellville experiment field. In 1914 tobacco experiments were laid out in which the effects of nitrogen in nitrate of soda, dried blood and sulphate of ammonia were to be studied. Nitrate of soda was used at the rate of 100 lbs. per acre, while dried blood and sulphate of ammonia were used in

quantities furnishing the same amount of nitrogen as in 100 lbs. of nitrate of soda. The experiments were run in duplicate. On account of the excessive drouth the tobacco was almost a complete failure, the crop from two acres being sold for fifteen dollars. The tobacco did not use the nitrogen. The ground was seeded to rye on one of the series of plots and to wheat on the duplicate series. There was no sign of any effect of the nitrogen on the wheat or the rye either in the fall or spring. This soil is decidedly deficient in nitrogen.

However, we frequently recommend the use of nitrate of soda or sulphate of ammonia as a spring top-dressing for wheat on soils deficient in nitrogen provided there is a sufficient supply of phosphorus in the soil either naturally or by application. On the average Kentucky soils outside the highly phosphatic Blue Grass belt we would not recommend the use of nitrate of soda or sulphate of ammonia on wheat land that had not been treated with phosphate, because nitrogen cannot increase the yield when phosphorus is a limiting element. The use of nitrogen in this way contributes nothing to the improvement of the soil.

Dr. A. M. Peter has been running an experiment on tobacco on the Experiment Station farm at Lexington in which one plot is fertilized with a complete fertilizer and the other with nitrogen and phosphorus. It is continuous culture of tobacco with no return of manure. The average yield of tobacco for complete fertilizer for five years is 1,497 lbs., while for nitrogen and phosphorus it is 1,431 lbs., a gain of 66 lbs. per acre for the use of potash. There is not enough known about the effects of the various fertilizer elements on burley tobacco to say whether they affect the quality sufficiently to justify their use on the highly phosphatic Central Kentucky soils. Certainly the yield can be made without commercial fertilizers. Such fertilizer experiments as have been recently conducted on the Experiment Station farm with tobacco do not show any material increases. Of course, this statement implies the maintenance of nitrogen with organic matter.

These results seem to be contradictory to the results obtained in the fertilizer experiments conducted on the

Experiment Station farm about 1888 to 1894, in which the use of potash salts gave such striking increases, especially on corn. The recent experiments on the Experiment Station farm at Lexington to which we have referred, were conducted on the north side of the present Experiment Station farm, which is well drained, while the old experiments were conducted on the south side of the present farm. Originally the Experiment Station owned only the south side of the present farm.

In my judgment the explanation of the results obtained in the old experiments is not far to seek. They were conducted on soil that was very wet and known as "cold" and "crawfishy." In fact, Dr. Peter, who helped to conduct the experiments, says the ground was so wet that it could not be plowed until late in the spring. The land was partially tilled later in these experiments. Last year when it was decided to resume these experiments on the old plots, and it became necessary to fence them off, we had opportunity to make some important observations. In digging holes for gate posts, solid rock was struck at a depth of $3\frac{1}{2}$ feet. The sub-soil is yellow and of a putty-like consistency and comes near to the surface, although the land had been in grass for the last twenty years. This shows poor aeration, a condition which prevents the accumulation of organic matter to any great depth. It is a well known fact that poor drainage tends to make potassium as well as other elements unavailable.

In addition to the foregoing adverse conditions, all of these crops in the old experiments were grown in continuous culture with no provision for the return of organic matter either in stable manure or green manure crops. In short, the experiments were conducted on a soil that is not typical of any considerable area in the Blue Grass region, and according to a system of farming that we today never recommend as building up and maintaining soil fertility.

This is no criticism of these experiments. They were conducted on the only land owned by the Experiment Station at that time. They were patterned after some of the Rothamsted experiments. Yet we are bound to admit today that many of the Rothamsted experi-

ments are not of practical application in farming, although they furnish valuable scientific data.

The results of these older experiments are valuable in showing that on poorly drained "crawfishy" soils potash is profitable. However, such soils form a restricted area. On soils of this nature tile drainage would no doubt render the use of potash unnecessary, besides greatly improving them in other ways.

At the time the above mentioned results were obtained the Experiment Station conducted ten co-operative experiments on corn with farmers living chiefly in the western part of the State. An average of all these experiments shows the following yields:

Nitrogen and potash	40.1 bus. per acre
Nitrogen and acid phosphate	44.7 bus. per acre
Nitrogen, acid phosphate and potash	43.6 bus. per acre

(See annual report for 1890.)

The results on the new experiment fields in the western part of the State tend in the same direction. The fields have been in operation only two years, both of which have been unusually dry. The soils of all these fields are badly worn and quite deficient in organic matter. While it would not be safe to base final conclusions upon them, the results from such crops as have not been severely affected by the dry weather show decided results from acid phosphate and rock phosphate, while potash has shown little or no results.

At Greenville* on rather poorly drained soil on one wheat crop (1914) potash treatment, as compared with plots similarly treated except for potash, gave an average increase of 1 bu. per acre, while acid phosphate gave an increase of 3.7 bus. per acre.

Limestone, acid phosphate and potash gave 2,955 lbs. of clover hay per acre (1914) while limestone and acid phosphate gave 2,800 lbs. Yet this soil is quite deficient in organic matter. Clover absolutely failed where limestone and potash were used without phosphate.

*These experiments and all others cited will be given in detail in a bulletin to be issued later. They are used here as a basis for a statement of the principles of soil fertility which the Experiment Station is teaching in the State.

The following results on tobacco in 1914 on the same soil speak for themselves:

Plot	TREATMENT	Pounds Per Acre
214	Limestone and acid phosphate.....	1235
215	Limestone and potash.....	760
216	Limestone, acid phosphate and nitrate of soda.....	1595
217	Nothing	575
218	Limestone, potash and nitrate of soda.....	580
219	Limestone, acid phosphate, potash and nitrate of soda	1410
220	Acid phosphate, potash and nitrate of soda.....	1625
221	Limestone, acid phosphate, potash and double ap- plication of nitrate of soda.....	1600

The clover and tobacco were on better drained soil than the wheat. There is a possibility that potash may have affected the quality of tobacco on plot 220, which graded a little higher than the other plots.

The significant thing in these results is that no material increase could be made in the absence of phosphate. Potash seems to have given little or no increase (compare plot 216 with plots 219, 220 and 221), but nitrate of soda gave a profitable increase after phosphate had been added. The tobacco was the first crop in the rotation of tobacco, potatoes and clover, so there had been no chance to restore organic matter and nitrogen to the soil by the use of clover. As stated, there is some evidence that potash improved the quality of the tobacco, although it is not altogether conclusive. More work will be required to determine this point. On a crop like tobacco, worth \$8 to \$10 per 100 pounds, one can afford to use expensive treatments that will increase the yield as much as 100 to 200 pounds per acre. The same ratio of increases on the ordinary farm crops must be produced very cheaply to be profitable.

At Russellville on the 1914 wheat crop potash gave no increase, while acid phosphate gave an average increase of 8.3 bushels per acre.

At Lone Oak, McCracken County, the soil was so badly worn and the season so dry that there was no appreciable effect of either acid phosphate or potash on the wheat.

At Mayfield the average gain for wheat was 6.6 bushels per acre for acid phosphate, while for potash alone and in combination with limestone and acid phosphate, it was 2.8 bushels. But comparing the plot treated with acid phosphate, limestone and potash with plots treated with acid phosphate and limestone, there is no gain for potash, the yield being 27.3 bushels per acre in each case.

On the Berea (Madison county) experiment field last year acid phosphate and limestone gave 45.7 bushels of corn per acre, while limestone, acid phosphate and potash gave 46.4 bushels. The yields of soy bean hay on corresponding treatments were 3,650 pounds and 3,770 pounds per acre. The yield of corn on untreated ground was 27.8 bushels per acre, and of soy bean hay 2,845 pounds.

On page 79 of Circular No. 144, of the Ohio Experiment Station, Dr. Thorne shows that as the average result of twenty years' experiments on the Wooster experiment farm, \$6.50 invested in potash returned \$1.44 above its cost, while \$2.60 invested in acid phosphate paid its cost and a net profit of \$13.92. On page 97 of the same Circular he further shows that as the average results of nineteen years' experiments on the Strongsville experiment farm, \$2.60 invested in acid phosphate paid its cost and gave a net profit of \$14.88, while \$6.50 invested in potash returned \$4.27 less than its cost. In the above cases the gain is for phosphate used alone in the rotation, while potash is used in addition to phosphate and nitrogen, giving the potash full opportunity to show its effects.

Dr. Hopkins, in the National Stockman and Farmer of April 3, 1915, shows that in the Pennsylvania experiments from 1885 to 1908, one dollar invested in potash paid back 9 cents, while phosphate paid \$3.44 per \$1.00. In this case also potash was applied in addition to phosphate and nitrogen.

In commenting on the soil requirements for corn, Prof. Williams, of the Ohio Experiment Station, says on page 76, Bul. 282:

"Proper soil conditions for the corn crop will then include thorough under-drainage, either natural or artificial; a crop rotation which will adequately maintain the organic matter of the soil through the

use of good sods of clover and grasses, and such catch-crops as may be adapted to the varying conditions, in addition to all the manure available, liberal applications of phosphorus to supplement the manure and natural deficiencies of the soil, as well as to restore the phosphorus sold from the farm in cereals and livestock; and lime as may be needed to correct soil acidity and furnish a satisfactory environment for bacterial life. In the absence of manure some soils will need applications of nitrogen and potassium before good crop yields can be secured."

On page 73 he further says:

"Manifestly something is needed on the land besides phosphorus. With the addition of either nitrogen or potassium to the above amount of phosphorus the yield of corn is increased to a little over 43 bushels per acre, and by the addition of both, to 47 bushels, though the profit over cost of fertilizer is but a little greater than from phosphorus alone, owing to the high cost of commercial nitrogen and potassium. Cheaper sources of these elements are found in the stable manure. Larger yields of corn have been secured with the use of manure, and substantially as good returns from phosphorus, when used in addition to manure."

In the report on the Piedmont soils of North Carolina, Professor Williams of the North Carolina Experiment Station, says on page 99, after summing up results of experiments:

"Of all the types of soils of the Piedmont Plateau Region of the State thus far studied, the content of potash present in the surface soil is generally sufficient for growing maximum crops for a hundred years or more. It is generally more a problem of making this supply available than of increasing it. Not only do the chemical analyses show that there is a fairly liberal supply of potash in these soils, but in no case do we find any marked increases in yield due to its use, and frequently the yield is actually reduced. Generally it certainly would give better immediate returns and would be far more beneficial to eliminate potash altogether for general farm crops, and put the money into an additional supply of phosphoric acid. Potash, however, can be applied with profit to tobacco and very probably to Irish potatoes on most of the Piedmont soils."

Bulletin 108 of the Mississippi Experiment Station reports experiments on worn hill land and makes the following comments concerning cotton:

"Phosphates hastened the maturity of cotton. On land with some decaying organic matter in it, phosphate alone gave good results, good enough to make it profitable. Potash alone, or in combination with nitrogen and phosphates, gave no apparent results. Nitrogen (cotton-seed meal) alone gave good results. Cotton-seed meal and phosphates mixed gave good results,"

Concerning corn and cowpeas on the same soil, the report further says:

"The land was thin upland. A drought of seven weeks obtained when the corn was young. Where the soil contained organic matter, phosphates alone gave good results. Potash alone, or in combination, failed to show any appreciable benefit. Nitrogen (cotton-seed meal) alone gave good results. A mixture of cotton-seed meal and phosphates gave good results.

"The fertilizer test with peas was interfered with somewhat by the October storm, but it was apparent that both acid phosphate and crude, finely ground rock increased the growth of peas in a marked manner—apparently doubling the crop."

The Experiment Station has never taught and never can teach that the mere use of phosphates is sufficient. It does teach their use as a basis for soil building on soils deficient in phosphorus. Through their use increased growth of legumes may be obtained through the proper use of which nitrogen and organic matter (humus) may be restored to the soil. This of course means either the turning under of some of the nitrogen-gathering crops or the feeding of them with a careful saving and return of the manure made from them, both solid and liquid (absorbed in the bedding). In addition, the non-leguminous crops in the rotation must be made to contribute to the organic matter of the soil by returning all the residues (stalks, straw, etc.) or the manure made from feeding the crops. Furthermore, cover crops and catch crops are recommended wherever practicable, these to be legumes where possible, and to be turned under as a rule. With this procedure the purchase of potash will not be necessary on most Kentucky soils and phosphorus does become the only element of plant food necessary to purchase for general farm crops. This is certainly teaching that cannot be criticized. Teachings that omit any of the above essentials cannot be laid at the door of the Experiment Station.

Yet there are soils that need potash. They are abnormal. Muck and peat soils, some poorly drained soils, and some sandy soils need potash. If I should find such soils to need potash I should as freely recommend its use on them as I do phosphates for soils deficient in phosphorus. If I should find the use of potash to be profitable on a high potassium soil until organic matter could be restored, I should unhesitatingly recommend its use

until such time as the natural supply could be made available. In none of our experimental work have we found potassium to be the first limiting element.

Granting, for the sake of argument, the need of potash on all soils, the ordinary application of fertilizers used in this State will not meet the demands of crops for potash. The 2-8-2 formula is a standard mixed fertilizer in the State, although many are sold containing even smaller amounts of nitrogen and potash. Two hundred pounds per acre is above the average application. A fifty-bushel corn crop requires about forty-three pounds of potash. The four pounds of potash contained in a 200-pound application of this fertilizer would be sufficient for an increase of less than five bushels of corn if the crop could get it all. But no one would contend that a crop could get all of the four pounds applied.

The amount of nitrogen in such an application is 3.3 pounds and is sufficient for an increase of only two bushels of corn if all of it could be used. Nitrogen is certainly a limiting element before potassium on most if not all of our soils. Yet it is generally present in fertilizers in less quantities than potash. I have yet to be convinced that any increased yield produced is not due chiefly to the sixteen pounds of phosphoric acid contained in the above application, which is a fair proportion of the twenty-six pounds required for a fifty-bushel corn crop. If this be the case, why pay \$2.50 to \$3.00 for 200 pounds of this mixture containing sixteen pounds of phosphoric acid when \$3.00 will buy 400 pounds or more of sixteen per cent acid phosphate, containing sixty-four pounds of phosphoric acid?

If a farmer is convinced from experience that it pays to use a small amount of complete fertilizer to give the crop a start, and such may be the case, he should at the same time understand that it neither supplies any considerable part of the nitrogen and potassium used by the crop, nor does it contribute to the permanent fertility of the soil.

Surely no one will contend at this late day that a farmer should buy nitrogen for ordinary farm crops. For example, a fifty-bushel corn crop requires seventy-five pounds of nitrogen. Four thousand five hundred pounds

per acre of 2-8-2 fertilizer would have to be used to supply this amount, granting that the corn could get hold of all of it, which it cannot do. The seventy-five pounds of nitrogen (required for fifty bushels of corn) would cost at least \$15, and generally more, at the usual prices of mixed fertilizers. One hundred to one hundred and twenty-five pounds of nitrogen would have to be applied in order that the crop could obtain seventy-five pounds from this source.

There are some special crops of high value per acre, such as tobacco, potatoes, cotton, vegetables, etc., on which the use of the three elements, nitrogen, phosphorus and potassium on some soils gives profitable results. In such cases, I would unhesitatingly recommend their use, at least until the soil could be built up to a point where some or all of the elements could be left off by rendering the supply in the soil available.

We recommend the use of acid phosphate more frequently than rock phosphate. We do so because we have found that acid phosphate is more effective, per dollar invested, than rock phosphate on soils deficient in organic matter, as most Kentucky soils are. We are experimenting with both forms. However, our experiments are on soils quite deficient in organic matter. If we find that when organic matter is restored to the soil the rock phosphate is permanently more profitable, then we shall as surely recommend the use of rock phosphate. Results in other States lead us to believe that such may prove to be the case. There are numerous cases in this State where rock phosphate is being used with great success by farmers who have manure or green manure crops to use with it. Bone meal is an effective form of phosphate, but the supply is exceedingly limited compared with the amount of phosphates that should be used.

It should now be evident why we lay such stress on the use of phosphates. It is for the reason that nearly all Kentucky soils outside the Blue Grass Region are very deficient in phosphorus and some within the outer circle of the Blue Grass Region. Phosphorus in these soils is the first limiting element. Under this condition, without the liberal use of phosphates, it is impossible to produce large growths of leguminous and other crops

to restore nitrogen and organic matter to the soil. The use of phosphates, therefore, is the very foundation of permanent soil improvement on such soils. In view of the fact that the returns from the use of phosphates are so much greater than from potash, granting that the latter does give returns in some cases, we cannot recommend the buying of potash until the farmer has first bought sufficient phosphorus to use on all of his soil. A fact worthy of notice in passing is that three-fourths of the phosphorus required for grain crops is in the grain itself. Hence if grain is sold there is a large loss from the soil. Animals retain on the average one-fourth of the phosphorus of the feed given them, so that both in grain farming and live-stock farming there is an unavoidable loss of an element already deficient in nearly all soils.

Our teachings always emphasize permanent fertility, and the absolute necessity of providing nitrogen and organic matter.

We recommend the use of limestone on acid soils as a means of increasing the growth of nitrogen-gathering crops and through them all other crops. However, all the evidence we have at hand indicates that on soils deficient in phosphorus, limestone does not prove profitable without the use of phosphates, but when used in connection with phosphates it is highly profitable. We can unhesitatingly recommend the use of limestone and phosphates on most Kentucky soils before potash, even if potash is to be used at all.

Let us see what the commercial aspects of the foregoing teachings are so far as the farmer is concerned. It means that if he wishes to use acid phosphate he will buy it wherever he can get it in good mechanical condition at the lowest price per pound for the phosphorus contained. If he wants to use potash he will buy it wherever he can get it at the lowest price. Likewise for materials carrying nitrogen. Formulas should not worry him. If he wants to use more than one element and wants to mix the materials for convenience in application (this is the only advantage in mixing) then he should determine how much of each element of plant food he wants to use per acre, and use the necessary amount of

materials to provide the desired plant food, regardless of what percentages the mixture might contain. Objection may be made that the farmer cannot get unmixed materials in good mechanical condition. He does get acid phosphate and bone meal in good mechanical condition. He can get dried blood and tankage in good condition. The only materials apt to be lumpy are potash salts and nitrate of soda. It is possible, however, to buy these reground in good mechanical condition. Of course, on standing they may become lumpy again.

Grinders and mixers may now be bought which can be run by hand or with a small engine.

A study of the mixed fertilizers sold in this State in 1909 showed that they sold for \$6 to \$10 per ton more than the retail prices of the materials of which they were made. (See Bul. 140, page 61). The cost of mixing fertilizers is not very great. The remainder of the difference between the cost of the unmixed materials and the mixed goods goes to cover cost of advertising, agents' commissions, local dealers' profits, extending credit, with some extra share of profits for the manufacturers. We are not recommending home-mixing except when fertilizers of the desired composition cannot be had at a fair price.

In contrast with the foregoing teachings, let us see what the Kentucky fertilizer market offers the farmer. It is no uncommon thing for a fertilizer manufacturing concern to operate under several different names, branches or subsidiary companies.

One such company operating in this State used in 1913 (Bul. 177) seven different series of brand names and offered for sale 44 different brands of complete fertilizers, although they had only 19 different formulas. Leaving off one subsidiary company which has very slightly, but not materially modified its formulas, this company offered 37 different brands representing only 12 formulas.

In one case one formula was offered under six different names by this general company. They were designated "tobacco grower," "special tobacco grower," "crop grower," "wheat and corn special," and two "corn and wheat growers." Frequently the same

formula is offered under two names by one branch of a company.

There are several manufacturing concerns operating on the above plan in this State. In one case one company operating in this way offered seventy-nine different brands of complete fertilizers in 1913.

During the year 1913 there were 434 different brands of complete fertilizers registered in the State. (See Bulletin 177). Of these 204 carried less than 1.65 lbs. of nitrogen in 100 lbs. of fertilizer (equivalent to 2 lbs. of "ammonia"). Most of the 204 brands were guaranteed to carry 0.82 lbs., or 0.41 lbs. of nitrogen per 100 lbs. of fertilizer, while the guaranty on some brands was as low as 0.21 lbs. per 100 lbs. of fertilizer. One hundred and twenty-nine brands were guaranteed to carry 2 per cent. potash, and fifty-nine less than 2 per cent.

Many farmers use only 100 lbs. of such fertilizer per acre. Imagine, if possible, less than one pound of nitrogen applied to an acre of corn, when 50 bushels of corn require 75 lbs. of nitrogen.

These fertilizers containing such small percentages of nitrogen and potash are essentially low grade acid phosphates selling under brand names as mixed fertilizers. Acid phosphate is the basis of them. They usually contain 8 to 10 per cent. phosphoric acid and sell for considerably more per ton, sometimes nearly twice as much, as 16 per cent acid phosphate which contains twice as much phosphoric acid. Sixteen per cent. acid phosphate should not be considered a low grade fertilizer simply for the reason that it sells for a lower price per ton than certain mixed fertilizers, such as those discussed in the foregoing paragraphs.

What the farmer is actually concerned with is the cost per pound of plant food contained in fertilizers. The manufacture of such low grade mixed fertilizers is virtually an admission of the importance attaching to the use of phosphates. If mixed fertilizers are to be used only high grade mixtures should be employed; that is, such as contain high percentages especially of phosphoric acid and nitrogen, for the reason that the plant food contained in them is cheaper than in low grade mixtures.

Smaller amounts may be used, thus saving drayage, freight and bagging charges.

The sale of low grade fertilizers will probably cease when farmers quit buying fertilizers by brand names and at the lowest price per ton regardless of composition. It is hardly to be expected that such fertilizers will not be offered for sale so long as farmers are willing to buy them.

Out of such a maze of fertilizers offered, how is the farmer to choose for his needs, unless he understands the fundamental principles of soil fertility and the nature of commercial fertilizers and fertilizing materials? It is clearly the duty of the Agricultural Experiment Station and all other agencies for agricultural instruction to give him in as clear and simple manner as possible this information.

THE RELATION OF FORESTRY TO AGRICULTURE

BY

J. E. BARTON, State Forester.

That there should be any relation between the production of agricultural crops and the production of forest crops in an agricultural State, such as Kentucky, does not occur to the average individual, and that there should be any interchange in benefits because of a knowledge of such relation between these two crops is a matter which is altogether too lightly touched upon in any discussion either of agriculture or forestry, solely as regards their individual merits. It, nevertheless, is a fact that the production of a forest crop on a farm may bear a very intimate relation to the production of the agricultural crop thereon, and have distinct bearing on the amount of profit derived from the purely agricultural end of the game. Indeed, it is possible to imagine a situation in which the net gain in any one year would be represented by the value of the products of the woodlot.

In considering the farms in Kentucky at the present time, it is evident that there is a large amount of them which are not producing the amount of produce which is possible for them to supply under the best conditions; and the fact that this is so, results from several features, among which may be mentioned the worn out condition of the soil, due to the lack of a proper amount of limestone, and imperviousness of the soil to surface moisture, due to shallow plowing, and a packed condition of the soil itself. Further, in a great many cases it is impossible to use land which has heretofore been used year in and year out, on account of the "washing" of the land—as this condition is generally termed. There are acres of land in Kentucky that are useless at the present time, due to the fact that the surface run-off has been so rapid that gullying and the washing away of the most valuable top soil portion of the soil has resulted. This last feature is particularly true on lands with a perceptible slope, and is especially noticeable in the extremely hilly sections, and in the mountains of the State. It may be proper here to set forth in brief just what functions the forests serve with regard to conservation of the soil, especially on hilly lands, and the economic part which the forests play in building up the soil itself. In the first place—and this is especially true in hilly and mountainous regions—the forests act as a soil fixative; that is, the mass of roots of the trees which extend in every direction through the soil, serve to hold it in place, and prevent it from washing down into the stream beds and gullies. It has been said, with a large degree of truth, that the best farms of Kentucky are at the present time in the Gulf of Mexico, due to the washing away of the rich top soil into the streams, and eventually down the Ohio and Mississippi. In the second place, the forests break the fall of rain upon the surface; in the third place, as nearly as it is possible to state, the mass of roots and the decaying vegetable matter in a forest act as a reservoir so that the rain which falls is soaked up as by a sponge, and is discharged in small quantities over long periods, and is not precipitated into the streams within a very short time as a surface run-off so that gullies and washes are formed. Again, the roots

of a tree in a forest or woodland penetrate the soil in every direction and consequently the soil is more readily penetrated by rain or other moisture which falls on the surface, and the moisture becomes available at a greater depth than would otherwise be possible. These are purely mechanical benefits which the presence of the forest or woodland has to offer. Further, there is each year deposited on the ground from the trees, a large amount of vegetable matter in the shape of leaves. This decays and eventually forms the top layer of the soil called the humus which is altogether the most valuable portion of any soil for agricultural purposes. Some trees are especially good from an agricultural point of view, in that they are legumes (the same as cowpeas, soy beans and alfalfa), and develop nitrifying nodules on their roots supplying to the soil nitrogenous elements, which are usually only obtainable by the use of expensive fertilizers. Such trees are the Kentucky coffee tree, black locust, honey locust and the yellow wood.

There is one peculiarity with regard to ownership of lands in Kentucky. Practically all of it is owned by individuals or corporations. A very small per cent is owned by the State, and none is owned by the Federal Government. Further, it has been my general observation, that on practically every farm in the State there is a certain per cent. of land, sometimes very small, it is true, which is not cultivated on account of the rocky character of the soil, or the precipitous nature of the slope. This may be along the bank of a stream, or it may be on the top of a small hillside, or it may be otherwise situated on the farm. Such land as this can be most economically devoted to raising a forest crop, and certainly worn out lands which are badly washed or gullied can in no other manner be so quickly regenerated and restored to a state of fertility as by planting a forest crop thereon. Outside of the mere fact that a forest crop is the surest means of restoring worn out land to its former fertility, the forest crop itself is of great value in connection with the farm. Probably the use of the wood produced in the forest or woodland, which would most readily suggest itself, is for fence posts. Good trees for this may be black locust, black walnut, or several other

species, or it might be soft woods, as willow, ash, or soft maple which are common to all Kentucky. Recent information in regard to fence posts made from such soft woods as have here been enumerated, shows that the treatment of such woods with a preservative, as creosote, can be made for approximately three cents per post, and that the life of the post so treated is from twenty to twenty-five years. Other uses to which timber raised in the woodlot can be devoted are ties, mining timber, hoops, poles, etc. There is one use to which trees on the farm may be put, which, up to the present time, has been little appreciated in Kentucky, and that is in the establishment of windbreaks. In the Western United States, especially in the treeless region, where the wind has full sweep for miles, one of the earliest uses to which trees were put was in the planting of windbreaks for the protection of the house and barn lots. This use is rapidly extending. The planting of a windbreak in Kentucky can, with very material benefit, be carried on in much greater degree than has heretofore been attempted. The value of the windbreak in connection with the orchards, truck gardens, fields, etc., is very direct and definite. There is the additional fact that the windbreak may be made to supply material for use on the farm, such as posts, in addition to performing their mechanical function as breaks. A large variety of trees may be used for this purpose, but, undoubtedly, a large percentage of evergreens in the windbreak will increase its value, especially during the winter season when high winds, as a usual thing, prevail. Windbreaks may also be made to serve in a large measure to beautify the farm, and in this modern age, the actual beauty of the farm itself is no small asset. The use of trees around the farm home and outbuildings, both for the shade they afford and for the screen which they effect to undesirable views, is a use which should be emphasized in connection with farm life. In considering the raising of a forest crop on the farm, the work involved may be accomplished almost entirely in the winter when ordinarily the stock and the labor available is not otherwise employed, so that the other farm activities are not interfered with; and the

“hands” and teams pay for themselves, and are not idle.

In estimating the value of a forest crop on a farm, no consideration has been given in this article to the actual mechanical details of establishing the forest or woodlot. The main purpose has been to call attention to the manner in which the production of a forest crop and agricultural crop may be made to go hand in hand, and each made to benefit from the other. The establishment of a woodlot or tree growth is not a difficult matter with the exercise of a reasonable amount of care in the planting. To make it an economical proposition, trees of small size, either seedlings or once transplanted material, should be used. If possible, the ground should be plowed before the tree growth is established, and the subsequent care and cultivation will amount to very little. To obtain the best results, thinings should be made from time to time of the backward individuals, and all the ground within the area devoted to the woodlot should be utilized for the production of trees. The selection of the species will depend a great deal on the individual, and on the section of the State in which he is situated, and can best be taken up for the individual problem.

There are some certain phases of the forest industry which lend themselves very readily to the farm, such as the cultivation of willow for use in connection with the baskets and willow ware industry. This is a very profitable business at the present time in the United States, because of the fact that a large amount of the supply heretofore obtained for the manufacture of baskets and furniture has come from Europe, and that supply has been in a large measure cut off. The popularity of willow for making furniture, especially porch furniture, has increased enormously in recent years on account of the lightness and durability of the product. The devotion of a few acres to willow culture will, undoubtedly, pay any farmer who is sufficiently interested to undertake the work, and as is the case with the production of forest crops on the farm as a whole, the time and labor devoted to the raising of willow can be arranged for at a

season of the year which is usually known as the slack season.

The growing of hickory for various purposes, such as hoops, poles and material for wagons and vehicle manufacture, also offers itself as a suggestion of the manner in which a woodlot on a farm may be utilized for the actual value of the product, at the same time that it is improving the soil condition or regenerating absolutely worthless land. Hickory of decided commercial value may be raised in from five to ten years, and, managed as a sprout forest, will produce a valuable production indefinitely. The raising of forest trees for producing nuts is another phase of the matter which should be carefully considered. At the present time nuts are an increasingly valuable product on the market, and there are a number of forest species which produce these, such as walnut, hickory, pecan and chestnut.

From this brief summing up of the matter, it is clear that not only may the forests be the means of adding distinctly to the value of the farm from an agricultural standpoint, but it may be also made to pay for itself during the regenerative period.

OPPORTUNITIES FOR BEEF PRODUCTION IN KENTUCKY.

By Edwin S. Good, Head Department of Animal Husbandry (Beef cattle, sheep and swine), Kentucky Agricultural Experiment Station, Lexington, Kentucky.

In many respects Kentucky is a State happily situated on the map for the production of beef cattle and its marketing under favorable conditions. The climate is medium between the long cold winters of the North and the long hot summers of the South, and such as to give the farmer a long growing season between frosts. Her different regions, though opposite in physical features, give her the opportunities for varied agriculture. Her location near the southern states gives her farmers the benefit of purchasing their cottonseed meal, one of the

cheapest feeds in the market if properly balanced with other feeds, at the same cost as her northern neighbors minus their extra cost of freight. As for her markets, with Louisville or Cincinnati within comparatively short reach of any section of the State, and the largest cattle markets of the world such as Chicago, not so far distant, the matter of marketing the finished animals is solved most satisfactorily for the feeder. With practical eradication of the cattle tick (the indirect cause of Texas fever) throughout large sections of the southern states, has come the impetus for the breeders to introduce pure bred bulls with which to grade up their cattle, a measure which means that eventually well bred steers in the South will find their way to the Louisville and other nearby markets to be purchased and finished by the Kentucky farmer, thus, in a measure, enabling him to raise the matter of beef production to as high a level as that enjoyed by other branches of the live stock industry. Then, too, on account of the high price of feeders, the time has come when it is profitable for the Kentucky farmer, even on high-priced lands, to raise some of his own steers. This is particularly true of the mountain and hill regions of the State. Much of this land should never be plowed on account of the washing of the soil, but be devoted to the production of live stock.

For some time past, the markets have not been looking for large beeves. This is due to the fact that smaller cuts of beef are more sought after by the housewife now than formerly. The writer saw 750-pound baby beeves top the Cincinnati market last May. These steers were well bred, had plenty of quality and were fat. Steers that have the quality to grade as baby beeves are the only kind the Kentucky farmer should raise. I do not mean by this statement that it is the only kind he should buy and feed, for the profit in finishing cattle depends largely on how cheaply certain grades can be purchased, and how well they can be sold. However, no one can afford to breed inferior steers, and that means the elimination of the scrub sire. Professor Mumford, of the Illinois Experiment Station, has determined that the use of a pure bred sire will raise the quality of a steer two grades. There being a usual difference of 35 cents per

hundredweight for each grade, would mean that the difference in the value of a thousand-pound feeder sired by a pure bred bull and one sired by a scrub would be \$7.00. On this basis, a pure bred bull siring fifty cows in a season would pay for his original cost in one year. If the cows of the mountain districts could be mated to pure bred bulls and the offspring grown until feeders and then driven to the districts of Kentucky having plenty of corn with which to finish them, this process of breeding in one district and finishing in another would mean a material increase in prosperity to all parties concerned. There are already signs, as one can see by visiting the county fairs in some of the mountain sections, that this very thing has been begun.

By paying careful attention to the pastures of the State, the amount of beef which they now produce could easily be doubled. This could be accomplished by the frequent cutting of weeds, for the reason that blue grass and other good pasture plants thrive if somewhat closely grazed, while weeds die if their tops are kept cut off. The best pastures of the blue grass region are those in which the weeds are kept down by frequent mowing. On such pasture the writer has seen thrifty two-year-old steers made fat during the summer months with no allowance of grain. If, in addition to the weeds being frequently cut, there could be an occasional application of manure to the pasture, the increase in the production of grass would be surprising.

During the past few years, many silos have been built in this State. Much credit for the erection of these silos is due to the Commissioner of Agriculture. On land that is not too rolling to grow corn and sorghum without soil washing, ensiling is the most economical way to handle the corn and sorghum crops. Some people think, however, that corn is too expensive to use for ensilage so are growing sorghum for that purpose. Both are excellent crops for the silo and yield a large tonnage per acre on fertile land. Land at this Station which had received two heavy applications of manure from the cattle sheds, yielded sixteen tons of corn and twenty-seven tons of sorghum per acre during the growing season of 1915, which was a very favorable one. The ad-

vent of the silo has already resulted in an increased number of beef cattle being fed in this State each year. In a test made at this Station in fattening steers with and without the addition of silage to the ration, the cost of gains was lessened \$1.68 per hundredweight when corn silage was used. The feeding of two-year-old steers during the winter months on rations with and without corn silage, with a view to finishing on pasture without grain, resulted in \$3.59 less cost per hundredweight of gain the first trial, and \$4.43 less cost per hundredweight of gain the second trial, where rations containing corn silage were used. In the first test the steers receiving silage in their ration during the winter months did not gain within twenty pounds per head as much on pasture as steers making the same gains during the winter months with a ration containing no silage. In the second test of this kind the following year, the steers which received silage during the winter months made 48 pounds more gain on pasture the following spring and summer than those which did not receive silage during the previous winter. These tests were conducted to throw some light on the prevalent opinion that steers do not gain well on pasture after having had silage the previous winter. The average of these tests would indicate that this surmise is not founded on sufficient evidence, and that cattle can be wintered much cheaper where silage is used than where it is omitted.

The richest agricultural country in the United States, namely, Lancaster county, Pennsylvania, feeds annually some seventy thousand steers mainly for manure. These cattle are fed in barns kept heavily bedded so that all the solid and liquid manure is conserved. The Kentucky farmer needs to learn the lesson of conserving the manure produced in his beef cattle feeding operations conducted during the winter months. This is accomplished at the Experiment Station by adopting the covered barnyard at one of the barns and by concrete lots at another barn. Records of manure made per steer during the winter feeding period have been kept, and as much as 5.32 tons of manure per steer have been produced in a 160 day feeding period. According to experiments at the Ohio Experiment Station, a single

application of manure applied at the rate of eight tons per acre would be worth \$3.67 per ton, from an increase in crops secured in a three-year rotation of corn, wheat and clover over similar land unmanured.

All conditions indicate a new era in live stock production in this State, not only as a profitable business in itself, but as a means of conserving and improving the fertility of the soil. In the furthering of this interest, the beef animal will always have a prominent place, for no other animal can convert the roughage of the farm into meat as economically as the steer.

KENTUCKY'S OPPORTUNITIES FOR PROFITABLE DAIRYING.

BY W. D. NICHOLLS, ASSOCIATE PROFESSOR OF DAIRYING,
IN CHARGE DAIRY EXTENSION KENTUCKY COLLEGE
OF AGRICULTURE.

In contemplating the opportunities for dairying in Kentucky, the writer has the advantage of years of work among dairy farmers in every section of the State, during which time we have visited hundreds of dairymen on their own farms, in this and most of the other important dairy States, carefully studying both the production and market ends of the business, always looking at the question from the farm management point of view, with the object of learning those principles on which farming may be pursued to furnish the largest continuous profits from the farm as a whole. Furthermore, our experience in the management of our own dairy farm over a long series of years of profitable operation, has given us both a practical and conservative point of view. We should, therefore, be in a position to make a conservative estimate of Kentucky's dairy opportunities. We are convinced that these opportunities are large and varied. First, might be mentioned our climate, which is free from the extreme cold temperatures of northern dairy districts. For this reason a smaller investment in barns and other buildings is required. An-

other advantage is the longer grazing season in Kentucky. Our soil as well as our climate is such that we are able to produce splendid crops of corn, clover, cow peas and alfalfa hay. A good dairy farmer in Kentucky will need to buy very little feed for his stock. This is extremely important, because the success of the dairy farm is almost in direct proportion to its ability to produce corn, hay, grasses and other forage for cattle feeding. A successful dairyman must first be a successful crop producer. Cheap raw materials must be available if profits are expected, and these raw materials consist for the most part of home-grown roughage. The dairy farmer whose capacious hay loft is filled with hay, whose silos are overflowing with rich corn ensilage, and corn fields smile with a bountiful harvest, is the man who will make money in dairying. Incidentally, the man who is engaged in dairy farming has the best opportunity to keep up the fertility of his soil so that bountiful harvest may be secured. Abundant proof of the importance of growing large quantities of roughage may be found anywhere in Kentucky where milk cows are kept. This is equally true in all of the great dairy districts of Wisconsin, Minnesota, New York, and Michigan. In all of these districts great crops of hay and forage are grown. Corn, hay and the dairy cow go hand in hand. The combination means splendid fertile farms, with well-built barns and silos, commodious homes and the highest type of rural citizenship.

Kentucky dairy farms have access to good markets. The cities of Louisville and Cincinnati furnish excellent markets for a large number of milk shippers. The smaller cities such as Lexington, Bowling Green, Hopkinsville, and Paducah, furnish local markets for dairy products. Evansville, Nashville and St. Louis are also within shipping distance to a large number of Kentucky farmers. Markets for cream and butter available for a much wider territory are furnished by a number of large creameries situated in the cities mentioned. Besides our local market for butter, we are at the gateway to the great butter market of the south, and also within convenient shipping distance of the centers of population of the east.

As a class the farms in Kentucky on which dairy products are produced as an important source of the farm income, are the most prosperous farms in the State. This is due to the fact that a herd of dairy cattle brings in a dependable income, which comes in at frequent and regular intervals.

As an example of the profits to be secured from good dairy farming in Kentucky, we might mention the experience of R. R. Dougherty, of Spencer county, who lives on a farm of 223 acres, which has been brought up to a high state of fertility. Mr. Dougherty purchased this farm 20 years ago, going into debt for almost the entire purchase price. He immediately established a dairy, and began shipping milk to the city of Louisville, fifty miles away. Within a few years the farm debt was paid off in full, and the farm today is one of the best in the State, producing an average of 60 bushels of corn, 20 bushels of wheat, and two to three tons of hay to the acre. Besides paying for and improving his farm, Mr. Dougherty has provided a good living for his family, given his children the advantage of a college education, built a splendid country home, which is equipped with all modern conveniences, enjoys the pleasures of an automobile, and has established himself as one of the wealthy and influential farmers of the county. This splendid success has come as the result of diversified dairy farming, and we wish to emphasize, very emphatically that diversified dairy farming is the only profitable system of dairy farming. With the dairy Mr. Dougherty combines a large amount of horse sense, as well as cow sense, and a goodly amount of hard work. One of the secrets of his success is that he has learned not to carry all of his eggs in one basket. He keeps a moderate sized herd of cows—only 24 in number—but these are good ones, and bring in an average of over \$200 per month. The other important yearly sales of his farm are 40 or 50 head of fat hogs, a small flock of spring lambs, two or three young horses or mules, five or six hundred bushels of wheat, and some fruit and poultry products. The yearly acreage of corn has never exceeded 30 to 35 acres. In discussing the growing of corn on his farm, which is of rather rolling nature, Mr.

Dougherty says that he regards corn as a splendid crop, but prefers to raise it on his neighbor's land, leaving his own land in grass. It will be seen from his acreage that he is careful not to overdo the corn crop. This system of hay and grass farming has resulted in the protection of his slopes from washing, and has greatly increased the humus supply and crop producing power of the land.

Mr. Dougherty has reduced his farm management to a system which brings results. From his dairy he secures an income of more than \$2,400 a year, yet the dairy does not seriously interfere with his crop production. His crops are as good as those of the best farmers in his section, and much better than the average. The cows are cared for in the morning and evening, before and after the field work, and the time is hardly missed. This farm is a model of good crop rotation, and the rational use of stable manure. The dairy herd is fed liberally on home-grown feeds, consisting largely of corn stover, corn silage, hay and crushed corn, the ration being supplemented and balanced by the use of a small amount of cotton seed meal and wheat bran. Less than \$300 a year is expended for purchased feeds.

Many other examples of success in dairying might be mentioned, as for instance that of Dudley Garth, of Todd county, in the southwestern part of Kentucky, who has developed a very profitable line of farming, in which the production of high-class butter and registered dairy cattle have occupied an important place.

Another line of profitable dairying is that of the making of ice cream on the farm for the local trade, as a side line to the farm dairy. The ice cream business in Kentucky is yet in its infancy, and offers a splendid field for profitable development.

An increasing number of Kentucky farmers are installing hand cream separators, and putting in herds of four to ten cows, separating the cream, taking this in a few cases to local creameries. In a majority of cases, however, local creameries are not available as markets, and shipment is made to large central creameries for butter-making. This line of dairying offers a nice weekly addition to the farm income. The receipts per

cow are not as great as those from sweet milk and sweet cream, but less time is required to take the product to the market or shipping station. Butter dairying is open to a large class of farmers who are too far from the market or shipping point to make it practical to ship sweet milk or sweet cream. The central creameries permit the cream to be delivered twice or three times a week, thus giving an average in saving time in delivery. The cream shipper has an added advantage in being able to keep the skimmed milk on his farm, thus utilizing one of the best of all feeds for calves, pigs and poultry. The production of milk from a few cows thus carried on in connection with the growing of crops and other live stock, is sure to increase in importance and profitability on very many Kentucky farms.

No state in the Union offers a more promising field for the profitable production and sale of dairy stock for breeding purposes. We have already obtained a world-wide reputation for Jerseys of the highest quality. One county (Shelby) leads all other counties in America in the number and excellence of her Jerseys. Buyers from nearly every state in the Union come here to place carload orders. As a result of this community breeding interest, there is always a market at good prices for all surplus stock. This adds many thousands of dollars to the income of the farmers of this and other counties, which have obtained a reputation for Jerseys.

In the breeding of Holsteins, a good beginning has been made in several sections of Kentucky, principal among which are communities in Nelson and Spencer counties, and several counties in northern Kentucky. For both Holsteins and Jerseys there is a rapidly increasing demand from southern farmers who have heretofore been compelled to go to the northern States to supply their needs. These buyers would gladly stop in Kentucky to make their purchases, thereby saving greatly in traveling expenses, and avoiding the long haul from the northern States. Kentucky Holstein breeders have developed some of the best Holstein strains to be found anywhere, and all stock which they offer for sale find ready buyers. The community breeding of Holsteins is probably even more promising in

profits than that of the breeding of Jerseys, because of this large and almost untouched southern market. Breeders have it in their power to make Kentucky one of the great breeding and market places for the Holstein breed.

Kentucky furnishes hundreds of examples of run-down farms which have been restored to fertility by dairy farming. A conspicuous example is the county of Pendleton. Fifteen years ago this hill county was washed and gullied, and the farm land was practically worthless. Today these same hillsides are growing splendid crops of sweet clover, blue grass and alfalfa, bank deposits have more than quadrupled, gullies have been stopped, commodious barns have been built, and good herds of dairy cows are bringing in a comfortable monthly income to a large number of farmers. The counties of Campbell, Kenton, Shelby, Spencer and Hardin may also be cited as examples of the effectiveness of dairy farming in increasing soil fertility. Kentucky farmers are beginning to realize that when well cared for, and properly applied, the manure from a dairy cow is worth \$25 or more per year, and that a herd of cows enables the farmer to feed the grass, hay and forage produced on his farm, thereby keeping a large part of the farm in grass, preventing erosion, and retaining plant food on the farm. Dairy farming means a profitable system of agriculture and increased crop production, and a larger income each year. Moreover, a good herd of dairy cows will bring in a much greater money return and utilize a given amount of feed to much greater advantage than an equal number of steers. For this reason the production of dairy products replaces beef production whenever population becomes dense, and land becomes high priced. This is shown by the experience of farmers in the dairy districts of Kentucky, and of other States, and by the practice of farmers in Denmark, Holland, Germany and other European nations.

The Kentucky College of Agriculture and Experiment Station is actively engaged in the encouragement of all phases of dairying in Kentucky, including the care, breeding and management of dairy cattle, and the

working out of profitable systems of farm management on farms where milk stock are kept. A special service is maintained for co-operation and aid in barn and silo building. Farmers engaged in dairying and those contemplating going into the business may secure valuable and practical assistance by communicating with the Department in charge of this work.

THE HOG INDUSTRY OF KENTUCKY.

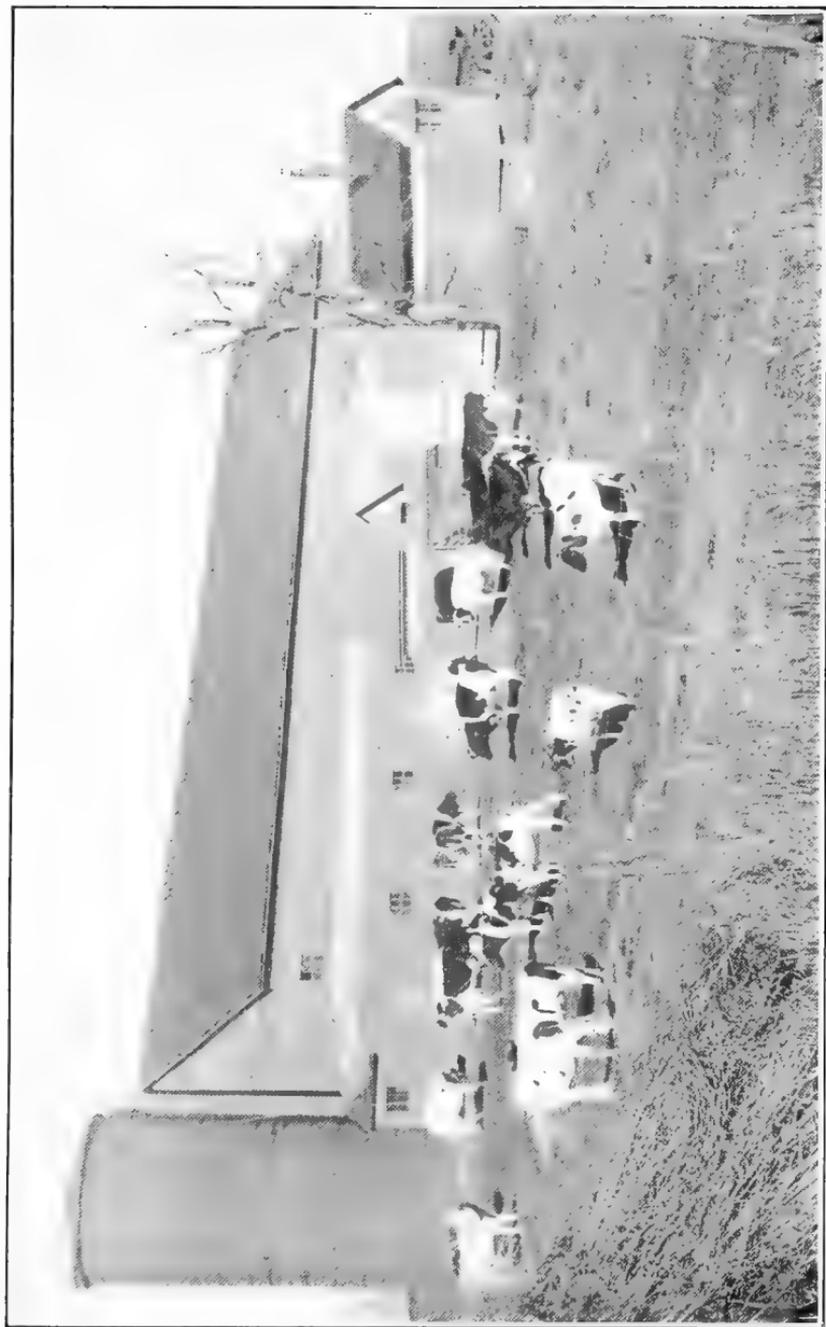
By E. S. GOOD, KENTUCKY AGRICULTURAL EXPERIMENT STATION, LEXINGTON, KY.

There is much being done by various agencies in the State of Kentucky to make the raising of hogs both a safe and a profitable venture. The enormous losses formerly sustained from hog cholera are now practically insured against by the use of anti-hog cholera serum, which can be obtained at cost from the Experiment Station, and used as a preventive if secured and administered in time. Bulletins and pamphlets stating the best methods of controlling hog cholera and other diseases affecting hogs can be obtained by an interested breeder. The hog cholera clubs established in this State are a further measure for the purpose of an organized effort toward eradicating this disease.

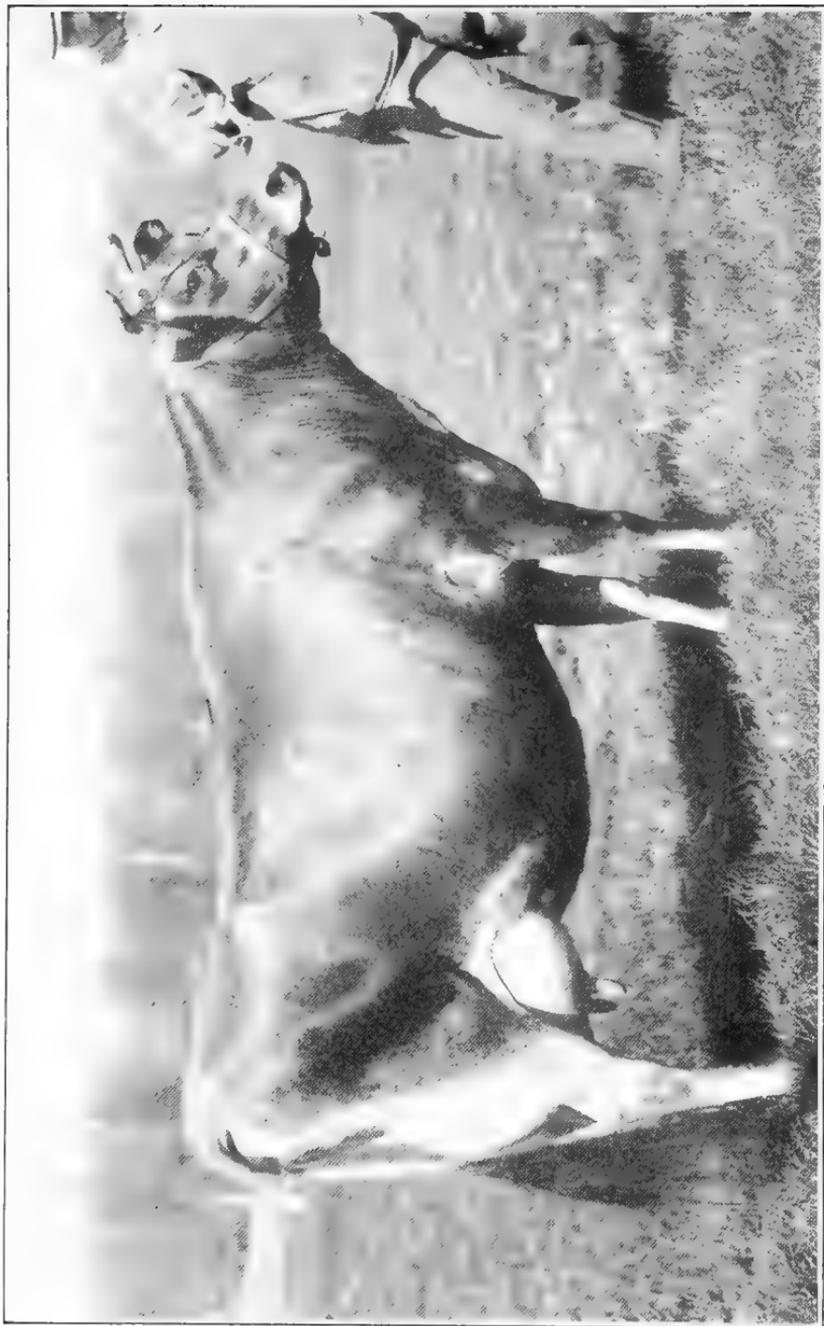
The Kentucky Live Stock Sanitary Board, in its strenuous and effective work in eradicating the foot-and-mouth disease in this State, as well as in other helpful measures, has made the industry of hog raising a safer one.

The influence of the Kentucky Swine Breeders' Association has been most helpful to the hog raisers of this State. At least once a year this organization holds a meeting for the purpose of discussing problems connected with the swine industry, and it can always be counted on for recommending and working for legislative measures favorable to this industry.

The Extension Department of the Experiment Station is making a fine effort to interest the boys of the



Wilson & Bowles' Herd of Holsteins.



TRIAL'S SWEETBREAD.

This dairy cow has an official record of 8,494 pounds of milk and 478 pounds fat (equivalent to 562 pounds of butter). Her milk in a year contained sufficient nutriment to build the bodies of two steers of twelve hundred pounds each.



Lady Fauwerd Lyons, 2nd Colantha, No. 142961 A. R. O. 19 01 lbs. butter, 424.9 lbs. milk as Jr. two-year-old, Barn record as Jr. four-year-old 18,080 lbs. milk 365 days. Owned by Sam Sullivan & Son, Bloomfield, Ky.



Dairy barn on the farm of Nicholls Bros., Bloomfield, Ky.

Fifty head of cows are kept on this farm, producing nearly 300 loads of manure a year, all of which, both liquid and solid, is saved and applied to the land. The crop yields have been quadrupled in the past six years.



Glazed Tile Milk House located on an eighty-acre dairy farm. The material for this house cost \$150, with labor of construction additional.



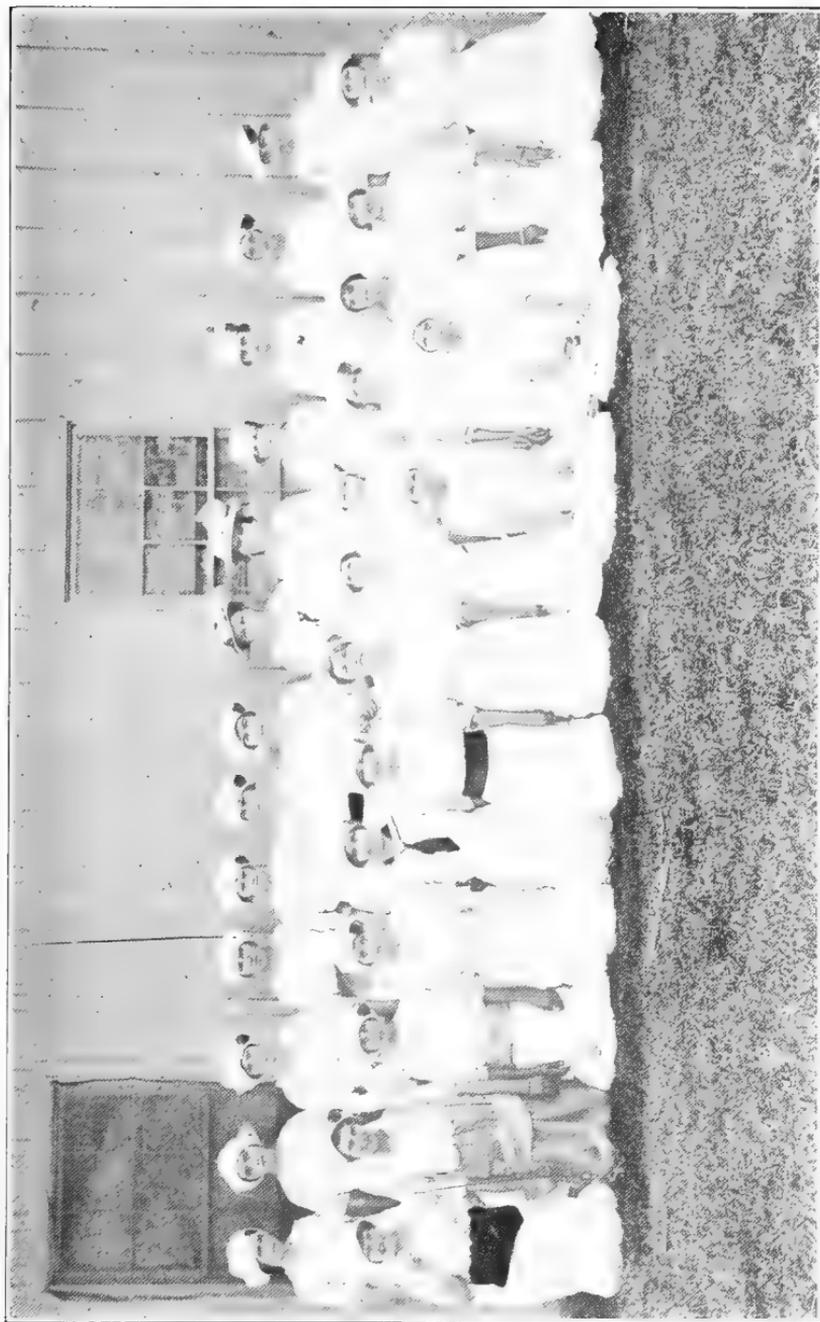
Old Hen House.
(See page 197.)



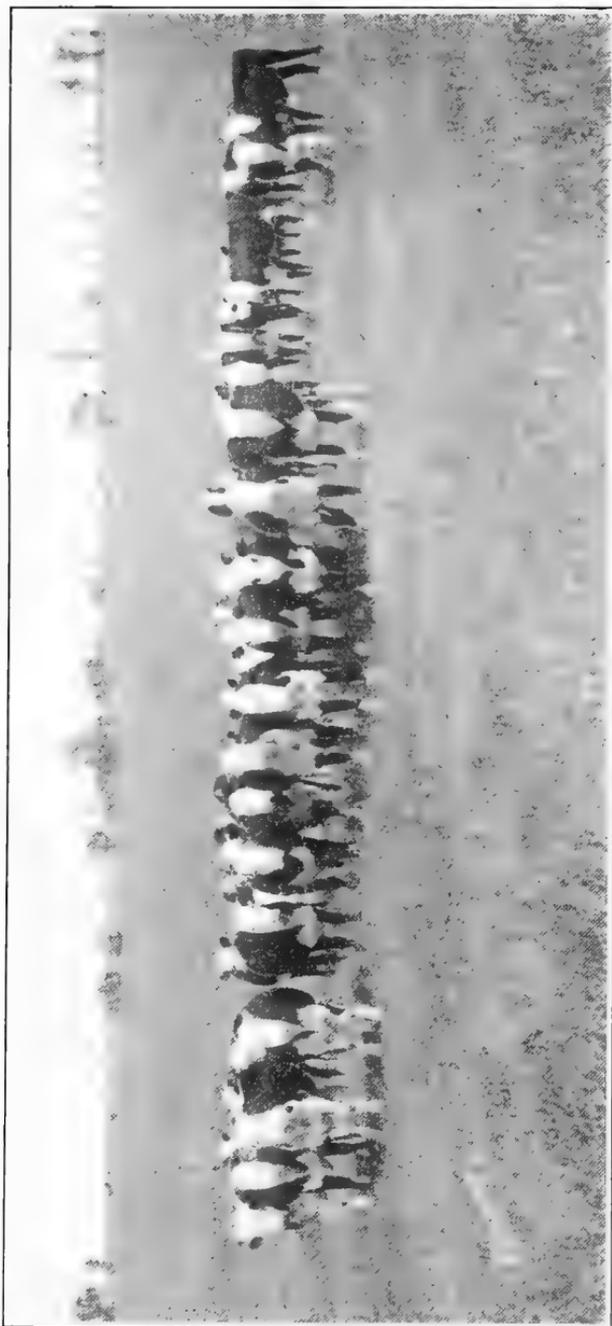
New hen house.
(See page 197.)



Experiment Station Poultry Yards.
(See page 197.)



Canning Club Girls of Mercer County. These girls canned and sold \$2,500.00 worth of fruits and vegetables in 1915.
(See page 137.)



Baby beeves, owned by Col. E. H. Taylor, Jr., Woodford County, Ky.

State in the raising of hogs. When a boy can be given an opportunity to be a partner of some one in such an enterprise he acquires interest in feeding and caring for animals which tends to develop the embryo stock breeder, and it may, perhaps, be one influence which in later years will keep him on the farm. The results of some of this club work directed by Professor Otis Kercher show that the hogs fed and cared for by the boys are usually larger, and, in many cases, the gains produced more economically than those produced by his elders.

Much is being done by the Experiment Station in the frequent publishing of bulletins noting the results of experiments in hog feeding, which are constantly being carried on. Some of the experiments show that by a proper rotation of forage crops the cost of growing and fattening hogs in this State can be greatly reduced. The farmer must realize, however, that it is necessary to feed some grain in addition to the forage crop to make the grazing profitable. A good rule to follow is to give a pig some grain from the time he is old enough to eat grain until he goes to the market, even though he has access to excellent forage crops. Good forage crops just about maintain a young hog, that is, they provide the sufficient nutrients for the production of blood, digestive juices, heat and energy; thus the additional food in the form of a grain ration is used for the production of bone, muscle and fat. The hog likes grain better than forage crops; therefore, it is best to give him a small amount of grain so that he will remain hungry to do considerable grazing. If the forage crop on which he is running is good, feed him from two to two and one-half per cent. of his weight daily in grain; as the forage crop becomes depleted, feed him three per cent. of his weight in grain daily. Grain thus fed to hogs on forage crops will net from \$1.00 to \$1.50 per bushel for the amount fed, and most of the fertilizing constituents of the same left on the land. How can grain be disposed of at greater profit?

To make the industry of raising hogs in Kentucky the most profitable, proper housing and sanitary measures must be adhered to. It must be remembered that the hog is sensitive to both heat and cold, and for that

reason should be provided with shade during the summer months, and dry, sheltered quarters in which to sleep during the winter months.

In Cincinnati and Louisville, Kentucky has splendid hog markets, in which respect she is much more fortunate than the Southern States, where the extra freight rates required of the shipper of the finished porker to more distant markets eat into the profits made from the sale of the same animals.

The warmer climate of the States farther south makes it difficult to properly chill and cure pork, even during the winter months, and that is one of the chief reasons why farmers in those States look to the packer to supply their immediate needs, which should be supplied from pork produced and cured at home. Kentucky, with her temperate climate, is particularly fortunate in this respect, as the winters are cold enough to enable the farmer to chill and cure his pork with safety, and thus provide meat for his own family and farm laborers at a small cost.

The raising of hogs is perhaps the cheapest and easiest breeding business in which to become established, because of the limited capital needed with which to begin, and because of the prolificacy of this particular animal. It is earnestly hoped that the efforts of the various agencies interested in the future of the Kentucky hog, together with the natural resources which Kentucky offers for the breeding, feeding and marketing of this animal, will result in a more intelligent and enthusiastic development of the highly profitable industry of hog raising.

THE SHEEP INDUSTRY IN KENTUCKY.

By Mark J. Smith, Department of Animal Husbandry (Beef Cattle, Sheep and Swine), Kentucky Agricultural Experiment Station, Lexington, Kentucky.

Kentucky is essentially a sheep State, possessing numerous marked advantages for this particular industry, and throughout the State the sheep industry is

fundamentally a spring lamb proposition with wool as an important by-product. The State has a pasturing season of long duration, the summers are not extremely hot and the winters are not exceedingly cold, hence it is necessary to shelter sheep only for a short time, if at all, during the year. There is an abundance of well-watered sheep grazing land, the transportation facilities are of the very best, and markets for spring lambs exist at the farmer's door. Kentucky, as is the case with all other states, has its drawbacks with respect to the profitable exploitation of the sheep industry. The stomach worm and the sheep-killing dog are generally considered the two worst enemies of the sheep. The increase in popularity throughout the State of winter forage crops is tending to reduce the dangers from the stomach worm, inasmuch as it makes possible a frequent change of pasture. Dogs do the most damage near the small towns, but the annoyance by dogs can be largely eliminated by a little care and watchfulness on the part of the owner. In some parts of Kentucky there are practically no drawbacks to the sheep industry, as the lambs are marketed so early in life that the stomach worm does not have an opportunity to get in its work.

Kentucky is especially fortunate in possessing a very valuable type of native ewe from a utility standpoint. These native sheep are the heritage of early colonial days, when sheep from southern England were brought to this country by the early colonists. The typical native mountain sheep of this region is an up-standing white or mottled-faced sheep, possessing a rather long neck, legs bare of wool and having a light, open fleece. The ewes have retained many of the desirable features of the south England breeds, and as a result of their environment during a long period of time in this country, have become very active and hardy. The better grade of these ewes is an excellent milker, is prolific and makes an almost ideal mother.

Since the spring lamb is the chief consideration of the sheep industry in Kentucky, the method most commonly practiced by the farmers of the State is to cross the mountain ewe with a ram of one of the leading mutton breeds. The Southdown has been the leading mut-

ton breed used during the past few years, but the Hampshire is now claiming considerable popularity. In this way a very good market lamb, having a dark face, is produced and at the same time the flock is being gradually graded up, in cases where the ewe lambs are retained to replace the old, worn-out ewes of the flock.

The care generally given to the flock varies a great deal throughout the State. Oftentimes, the ewes run out on pasture the entire year. Pastures in winter and in early spring are commonly supplemented with rye, corn fodder, sheaf oats or a little grain. In general, the practice is to give the flock shelter for a period of four or five weeks at lambing time, when some sort of grain is commonly fed.

The best results are obtained when the lambs are sold milk fat from their mother's side, at from four to four and one-half months of age. A portion of the lambs are marketed in May, perhaps fifty per cent. of them in June, thirty per cent. in July, and the remainder in August. At the time when the run of western fed sheep on the market is closing, the lamb crop from Kentucky and other mid-south states begins to arrive. Last season, the Louisville market began the season on a twelve-dollar basis for spring lamb. For some time, Kentucky has been a supply factor of considerable importance in the spring lamb trade, and the statement was made to the writer by a leading commission man in Jersey City, this summer, that the best spring lambs they received came from Kentucky.

Within the past three years there has been a small decline in the number of sheep kept in Kentucky. The present contraction of the industry in the State can only be of temporary nature. With a great decrease of sheep in the Rocky Mountain district, and with the increasing consumption of lamb by the American people, Kentucky is destined to play a much larger part in this important branch of animal husbandry, spring lamb production. Great economic changes are occurring in the country, a movement which is forcing the center of meat production eastward to the farms of the East and South, and it seems that in the future a large supply of the lamb and mutton must come from the small farm flocks, and there is no

state in the Union in which the small-farm flock proposition fits in the system of agriculture more profitably and naturally than Kentucky.

The receipts from wool and spring lambs in Kentucky would be greatly increased if the farmers would devote a little attention to the subject of docking, castrating and selection of rams. All lambs intended for market purposes should be docked and castrated, with perhaps the exception of hot-house lambs. No producer of spring lambs can afford to use a scrub ram. It is not difficult for a breeder who has been using a scrub ram to add at least one dollar per head to the value of lambs by using a pure bred ram of the proper type. The sheep is an especially profitable animal in Kentucky, inasmuch as it yields a double income—both wool and mutton. The wool under ordinary Kentucky conditions will pay the expense of upkeep throughout the year. The annual income per head in flocks throughout the State varies from five to fifteen dollars. The ewe kept under average conditions should bring in an income of at least seven dollars per head. The money income is not the only consideration. The activity of the sheep in killing obnoxious weeds, keeping the fence corners clean, and converting other waste material of the farm into cash, is not to be overlooked.

An investigation into the sheep industry of the State offers great opportunities for optimistic statements with regard to its future. The conditions all point to a period of prosperity for the sheep husbandman, and Kentucky, with all her natural advantages for sheep husbandry, should develop within the next few years a much greater sheep breeding industry.

POULTRY RAISING IN KENTUCKY

By J. J. HOOPER, KENTUCKY AGRICULTURAL EXPERIMENT
STATION, LEXINGTON, KY.

The hens in Kentucky produced seven million dollars worth of eggs in 1910, and the farmers raised seven million dollars worth of poultry during that year. After consuming a considerable quantity of the eggs and chick-

ens on the farm, the farmers sold four million dollars worth of eggs and two million dollars worth of chickens. Adding the last two sets of figures, we find that the poultry on the farms of Kentucky earn annually for the farmers six million dollars. These figures serve to show the magnitude of the industry in this Commonwealth, but upon comparing these statistics with those gathered in Missouri, we find that there is great room for growth and expansion. During the year 1910 the Missouri farmers sold eighteen million dollars worth of eggs and chickens. That State is no better adapted to poultry keeping than our own.

Upon comparing the figures presented in the Tenth Census Reports, we find interesting material regarding the magnitude of the poultry industry in Missouri ten years ago and today. In 1899 the census figures show that the chickens in Missouri produced seventeen million dollars worth of eggs and fowls, and in 1910 thirty-four million dollars worth. Why did the figures double during that decade? Because the Experiment Station and the State Department of Agriculture began an aggressive campaign in favor of the hen. They convinced the farmer that there was money in poultry raising, they taught them how to combat diseases, how to feed the young chicks and prevent gapes, diarrhea, and other disorders. Under the guidance of these influences the farmers gave up old methods and adopted newer and better ones.

A similar campaign has been begun in Kentucky, and the same beneficent results will accrue. But we will have to give up many old-fashioned ideas that have held sway during the past years. For instance, our old-styled chicken house will have to go. It will have to give place to the modern curtain front house, that furnishes room for exercise in winter, and protection from bad weather, and plenty of shade in summer.

No one seems to know where the plan for the top-heavy, slatted-sided chicken house originated. Now that the searchlight of science has been thrown upon it, and its faults clearly elucidated, no one will stand sponsor for it. This type of house offers almost no exercising room, and the roosts are placed directly over the

slatted sides. The cold air of a brisk January night has free access to the hens, and they cannot produce eggs when subjected to such temperatures and exposure. As there is no room in the bottom of the house, the birds are compelled to leave the house during the day, and they become chilled to the marrow. The same amount of money that is required in erecting such an unfortunate type of house will, when judiciously expended, erect a first-class home for the faithful hens.

The curtain front house embodies the following principles: The curtain permits the cold air to filter through slowly, but the birds inside are not subjected to cold drafts at any time. When hoisted, the curtain front permits the sunshine to enter, which destroys bacteria and dries the house. In summer the curtain can be arranged to act as a shade and prevent the hot sunshine from entering. The curtain front house should have a sloping, or shed, roof, which drains all the rain-water to the rear, where it is out of the way. The house should be about eight feet high in front and six feet in rear. The space around the roosts, which are usually placed in the back part of the house, should be double walled or boxed in, to keep the birds warm in the winter time. The proportions of the house should be two-thirds as wide as deep. A house ten feet wide should approximate fifteen feet deep. This prevents cold air from blowing on the birds. The curtain should be at least three feet from the floor, as the wooden wall below the curtain will prevent cold air from striking the hens when they are in the front of the house. Feed hoppers, water fountains, and nests are arranged around the walls. At the Experiment Station straw litter is placed on the floor six inches deep, and this is changed once every month. Some poultrymen advocate utilizing shavings for half the litter, as the shavings absorb a great quantity of moisture. At the Station the houses that have wooden floors are built on posts fourteen inches from the ground. This offers a cool open space for the hens to rest during the warm summer months, and prevents harboring nests of rats. A wooden platform, or droppings board, is placed underneath the nests, and the manure is raked from this board twice a

week. The roosts are twelve inches above this platform, and the roosts, which are made of two-by-fours, are placed on a level, as the birds will crowd to the highest roosts if there are such. A poultryman in this State has driven large wire nails in the roosts every ten inches. His idea is that it provides an individual space for each bird, and prevents crowding. In a properly constructed house the hens may be confined during bad weather. The grain is fed in the deep litter, and the hens have to scratch and exercise in finding the wheat and cracked corn that is fed. During the morning hours they have free access to a finely pulverized mixture containing alfalfa meal, corn meal, shorts, salt and beef scrap. Water is supplied in clean crocks and fountains. It is a beautiful sight to open the door and look in on a house full of hens that are at work scratching for their feed on a cold day in the winter, cackling and cawing as they work, and shelling out eggs at the rate of almost one a day, while your neighbors' hens are standing idly around in the snow, or trying to find something to eat in the manure piles around the barn. The accompanying photographs speak for themselves.

COTTON PLANTING IN KENTUCKY.

S. L. DODDS, HICKMAN, KY.

Statistics show that Kentucky raises more cotton to the acre than any State in the Union, but unfortunately there is but one county within the boundaries of our broad Commonwealth in which this valuable staple can be produced, viz., Fulton county. This county, in 1915, sold between \$800,000 and \$1,000,000 worth of cotton and cotton seed, not taking into account the cotton seed by-products.

Prior to twenty-five years ago, cotton could not be successfully grown in Kentucky, notwithstanding certain lands in the lower end of Fulton county appeared particularly adapted to this crop. It remained for four brothers, the Dodds Brothers, of Hickman, Kentucky,

to discover the cause and to apply the remedy; and today Syd L. Dodds is the biggest grower and shipper of cotton in the State of Kentucky. The story of his success in growing cotton is interesting, and proves that his wonderful crops are the result of careful study and thorough investigation, rather than the discovery that certain lands in his county would grow cotton.

Something over twenty years ago Mr. Dodds went from his home in Hickman to the Delta of Mississippi, where he engaged in the lumber and live stock business, and later the cotton business. He and his brother, R. E. Dodds, compared the low lands of Fulton county, Kentucky, with the lands surrounding the little town in Mississippi, which was named "Doddsville" after Syd L. Dodds went there to live, and found a marked similarity. They then decided to give cotton a try-out in Kentucky, and at once procured the best seed to be had in Mississippi, and planted it in the lowlands between Hickman and Reelfoot Lake. The new crop started in a way that was very gratifying to its sponsors. The growth was strong and healthy, and exceedingly well-fruited, but it developed that it would not "open" early enough in the northern climate to escape the frost, and the result was disastrous. It then occurred to Syd L. Dodds that if he could acclimate the southern crop to new conditions, he could make it a success. He accordingly planted again the next season, and had seed carefully selected from the earliest maturing cotton, which was not damaged by the frost, for the next season's planting; and while the yield from his cotton was small, he had now a supply of seed which he believed would grow quicker maturing cotton than those secured from southern cotton, and his surmise was correct. The next year, long before frost came, snowy fields of long-staple cotton was a reality in Kentucky, and later Syd L. Dodds sold to one planter in Mississippi, at one time, \$10,000 worth of cotton seed, because Kentucky cotton matured earlier than Mississippi cotton.

As soon as it was found that they could successfully grow cotton at home, the Dodds brothers built a small

gin to take care of their own cotton, and for several years only ginned two or three hundred bales a year. About this time the Mississippi river levee below Hickman was extended down the river, reclaiming more of this fertile land, and as rapidly as it was reclaimed, it was put into cultivation. Cotton planting was taken up by everybody who had or could get any of this bottom land, and thousands of acres which had been considered worthless, and could be purchased at one dollar the acre, advanced in value to as high as \$125 per acre.

The accompanying photographs show the Dodds' gin at Hickman receiving cotton from the wagons and loading it baled onto steam boats. During the ginning season this gin alone ships approximately 1,200 bales of cotton per week, and pays to the cotton growers daily between \$7,500 and \$8,000. Cotton has made Hickman one of the best towns in Kentucky, and the land surrounding Hickman cannot be bought now except in small tracts. King Cotton reigns supreme in the bottom lands of Western Kentucky, and is a most popular monarch.

REPORT OF UNITED STATES DEPARTMENT OF
AGRICULTURE WEATHER BUREAU,
KENTUCKY.

Louisville, Ky., October 15, 1915.

WEATHER CONDITIONS DURING 1915, BY PROF. F. J. WALZ.

The growing season of 1915 was noteworthy in that it was one of the coolest and wettest seasons on record, and in direct contrast with the seasons of 1913 and 1914. The first four months, except January, were remarkably dry, and especially April, which was one of the driest Aprils on record.

The rains began in May, and continued in more or less regular intervals through the summer and fall. During the month of February and much of April there was considerable unseasonably warm weather, but otherwise

temperatures were generally below normal, and not so much on account of unusually low temperatures, but due rather to the fact that the maximum temperatures kept so universally low. From May 4th to October 12th there were but five weeks when the temperature did not average below normal. The warmest week for the entire season from the normal point of view, was the week ending April 27th, while the coldest week with reference to normal conditions was the week ending August 31st.

The conditions obtaining are given in detail in the following summaries and the accompanying table:

JANUARY.

Moderate temperature, generally above normal, prevailed during the first 17 days. A change to colder occurred on the 18th, and, except for the 31st, unseasonably cold weather was the rule during the rest of the month. While the temperature averaged considerably below normal, largely on account of the low maxima, there were only a few days when severe temperature conditions obtained.

Precipitation averaged somewhat above normal, and was heaviest over the southern border counties, and lightest over the northeastern counties. Snowfall was unusually heavy. In nearly all parts of the State the ground was covered with snow from the 18th to 30th, inclusive. There was very little snow during the first half of the month, but in the period 18th-25th snow occurred nearly every day; also there was considerable sleet on the 22d, 23d, and 24th. The snow and ice covering practically disappeared with the warm rains and high temperature of the 31st.

FEBRUARY.

The general weather conditions prevailing during February, 1915, in this section were remarkably favorable for a winter month. There was a notable absence of winter storms and of any severe winter weather. Only five times during the past 27 years has the temperature in Kentucky for February averaged higher than, or as high as, that of this year. Of these Februarys, three

were those of 1890, 1891 and 1892, and the other two those of 1909 and 1911. The highest temperature reached in the State during the month, 75°, has been exceeded many times during that same period; but 13°, the lowest temperature reported this month in the State, is the highest State minimum in the Kentucky section records for February except in one year, namely, 1890, when the lowest recorded was 16°.

Precipitation for the month averaged less than one-half of the February normal over the State as a whole, and was considerably below normal at every station. There was very little snow.

Spring plowing was begun in various localities before the close of the month; and, at the end, trees and shrubbery were showing buds and crocuses had appeared.

MARCH.

The month was the coldest March since State records were established, and also with two exceptions, March, 1889, and 1910, the driest. There were no severe temperature extremes, but daily minimum temperatures were seldom above freezing, while maximum temperatures were unusually low, the maximum for the State being the lowest on record for March. There were no warm periods. Heavy frosts and hard freezes occurred almost every night, and vegetation made no appreciable growth, the appearance of the fields and woods at the end of the month being as bleak as in midwinter. The blustery weather characteristic of March was notably absent.

The precipitation for the month averaged less than half the normal amount for March, and was much below normal in all sections. Small grain and pastures began to show the effect of drought, especially in the western part of the State. The dry weather, however, was remarkably favorable for outdoor work. Spring plowing advanced rapidly, many farmers being practically a month ahead with the preparation of their land at the end of March.

APRIL.

The unseasonably cold weather that characterized March, continued during the first four days of April, when unusually low temperatures were registered in all parts of the State, minimum temperatures ranging between 17° and 30° . During this period killing frosts occurred generally, the last for the season being reported from most stations in the eastern and northern counties during the period 13-15th. On account of the dormant condition of vegetation, due to the persistent cold weather, practically no damage resulted from these low temperatures.

The latter half of the month was unusually warm, and temperatures in the 90's occurred at many stations on several days, while the month averaged the warmest on record for the State, except April, 1896.

The month's precipitation averaged less than one inch, the least for April since the beginning of State averages, and the ground became too dry to plow before the end of the month. Spring plowing had been generally completed, however, before this condition was reached, but planting and germination of seeds were delayed. Wheat, rye, oats, pastures and tobacco beds suffered severely from drought, and there was some complaint of shortage of stock water.

MAY.

The month opened cool. In fact, the nights were unseasonably cool during most of the month, and while there was a number of warm days with maximum temperatures of 90° and over at some stations, and the temperature averaged near normal, the month as a whole can be classed as a cool May, due in considerable measure to cloudiness and wetness. Remarkably cool weather, with temperatures ranging between 38° and 48° , prevailed from the 5th to the 11th, inclusive, and again in the period 17-19th. The pronounced warm periods were the 2-3d and 13-16th.

Droughty conditions which had prevailed over the State practically since February were greatly relieved by showers early in May. Beneficial showers continued

intermittently during the first two decades, while during the last decade rains occurred daily and were frequently heavy, causing damage in some localities. Also there were several destructive thunder-storms, the most severe occurring on the 25th, when a wind velocity of 74 miles per hour was registered at Louisville, the highest wind velocity on record for that station.

Rainfall over the State for the month averaged 6.62 inches, or the largest for May since State records began in 1889. At the beginning of May the average total rainfall over the State since the first of the year showed a deficiency of 7.08 inches. The surplus in May of 2.70 inches reduced this deficiency to 4.38 inches, the summer being ushered in with soil, stream and water sources generally well supplied with sufficient moisture.

Abundant rains during the month furnished much needed moisture, and crops generally made splendid progress. By the middle of the month corn planting was practically completed, but cultivation was hindered the latter part by continuous rains. Tobacco planting, delayed on account of the scarcity of plants, was progressing rapidly at the end of the month, also wheat was heading out, but short. Oats, meadows, pastures and grasses of all kinds, garden truck and fruit were in fine condition, and strawberries were yielding an excellent crop.

JUNE.

Cloudy, rainy and unseasonably cool weather, which prevailed so largely during May, continued during the greater portion of June. While minimum temperatures did not register as low as they have in a number of past Junes of record, maximum temperatures kept remarkably low, and the highest reached, only 95°, equals the record in the State for June in this respect. Rains were numerous, and heavy on several days, and in some portions of the State, but at a number of stations the total amount for the month was below normal, and the average for the State as a whole was only 0.57 inch above the normal for June. The month was remarkably favorable for transplanting tobacco plants, and for all growing

crops, especially gardens, pastures, grasses, corn and oats. But the large number of rainy days greatly interfered with harvesting wheat and hay, the cultivation of corn and tobacco and all farm work. Much corn was planted late, besides, as there had been considerable overflowing of lowlands, much replanting was necessary. Also, owing to continued rains, lands became packed and grass and weeds were exuberant. A period of fair weather from the 22d to the 27th gave an excellent opportunity for harvesting wheat, and by the end of the month this work was practically completed and some threshing done. Considerable damage was done in various localities by rain, wind and hailstorms, and there was a number of fatalities and some destruction of property from lightning.

JULY.

The weather during the first two weeks of July was remarkably rainy and cool, rains occurring more or less generally nearly every day, with many heavy damaging showers in various localities, but particularly in the central and northern portions of the State. During these two weeks excessive rains and wet weather caused serious damage to crops by the flooding of low lands, the washing of the soil, and hindering of cultivation. Wheat was badly damaged over large areas immediately before and during harvest; also continued wet weather at threshing time caused much loss. Corn and tobacco became weedy, cultivation being practically impossible in many localities. Day temperatures rarely reached 95° in any part of the State previous to the 13th. At Louisville a temperature as high as 90° was reached for the first time this year on the 14th, which is ten days later than the record for any previous year since the records were begun in 1871.

During the last two weeks, however, the weather conditions were highly favorable, being much warmer and dry with only occasional showers, and one or two rainy days. But it was again quite cool in the period 21st-24th.

AUGUST.

Except for a few warm days at the beginning of the month, and during the second decade, the month was unseasonably cool throughout, with temperatures almost continuously below normal. Minimum temperatures during the last decade registered in the 50's on most days, while on the 31st they ranged between 42° and 50° at most stations in the central and western part of the State, and only slightly higher in the eastern counties. August records for low temperature were broken at many stations in the northern counties. It is noteworthy that the mean temperature of each month from May to August, 1915, inclusive, has been below normal, the average daily deficiency being 2°. The average rainfall for the State for the same period was 7.16 inches in excess of the normal amount. This month's average rainfall was the greatest on record in Kentucky for August since State records were established in 1889. Rain was very frequent, there being only a few days without fairly general showers. At two stations rain fell on 13 consecutive days.

The wet and unseasonably cold weather combined to greatly retard the development of corn and tobacco, and also interfered with harvesting the latter crop. Corn and tobacco were considerably damaged by wind in several counties during the passage of the storm of 20th-21st. Farm work was generally delayed except fall plowing, which, on account of favorable soil conditions, was unusually well advanced at the end of the month.

SEPTEMBER.

As a whole the month was favorable for the maturing and harvesting of the staple crops, and for the preparation of the soil for seeding, except that the last decade was too cool to properly develop late corn. During the first week temperatures were generally below normal, but warmer weather set in on the 7th, and continued to the 20th, maximum temperatures during this period registering generally above 85° at all stations. Temperatures in the 90's prevailed generally during the week beginning with the 11th. A decided change to

colder occurred on the 21st, and, except the period 24-26th, temperatures were considerably below normal during the rest of the month. Light frost was reported from a few stations on the 22d, but there was no damage.

Precipitation averaged somewhat above normal, and was fairly well distributed over the State. There was much bright, clear weather, and only a few local storms during the month, and farm work was well advanced at the close.

1915	Temperatures				Precipitation		Average Number Days			
	State Average	*Departure	Highest	Lowest	State Average	*Departure	With 0.1 or more rain	Clear	Partly Cloudy	Cloudy
Jan.	33.0	-2.4	65	0	5.03	+0.81	13	8	7	16
Feb.	41.9	+6.5	75	13	1.74	-2.00	8	9	6	13
Mar.	37.8	-8.5	65	11	2.11	-2.78	8	12	5	14
Apr.	60.1	+4.2	96	17	0.96	-3.11	5	17	8	5
May	65.2	-0.5	95	35	6.62	+2.70	15	9	8	14
June	71.7	-2.2	95	42	4.79	+0.57	12	12	10	8
July	75.7	-1.1	102	49	5.30	+0.95	11	14	11	6
Aug.	71.3	-4.4	100	42	6.29	+2.94	14	9	10	12
Sept.	70.7	+0.1	99	32	3.32	+0.62	7	17	8	5
Oct.	60.6	+2.9	90	27	3.40	+1.12	6	18	7	6
Nov.	49.8	+3.8	85	16	4.80	+1.21	9	15	7	8
Dec.	36.9	-0.6	64	9	7.56	+3.77	12	10	6	15

*Compared with 25 years' normal.

GAME AND FISH COMMISSION'S EXHIBIT.

CO-OPERATION OF THIS DEPARTMENT WITH STATE FAIR
BOARD OF MUTUAL ADVANTAGE.

PERMANENT EXHIBIT ESTABLISHED.

Co-operating with the Commissioner of Agriculture and the State Fair Board, the Game and Fish Commission is rapidly developing a permanent exhibit of game birds and animals that must prove interesting and instructive to the thousands of visitors to the State Fair.

In the eleven-acre enclosure set aside by the State Fair Board for this permanent exhibit, fifteen deer are now held. (The herd will be kept at about this number and the increase sent to the game preserves throughout the State.)

There were twelve varieties of imported pheasants in the exhibit during fair week. Besides pens containing wild turkey and eleven varieties of wild duck and geese, there were four varieties of squirrel shown, and the first car, in full operation, was open to inspection.

The State Fair Commission has fallen heir to six alligators that are now being cared for and to be added to the exhibit. By the addition of pens of rabbits, coons, foxes, possum, and various other native animals, with a covey of Bob White quail and a few other birds, all of which is contemplated, this exhibit develops into the proportions of a real zoo.

The Game and Fish Commission is in no way a burden upon the taxpayer of the State, but draws its revenue from the sale of hunters' license, and a small per cent. of the fines imposed against violators. In the two years since the last biennial report, from October, 1913, to October, 1915, there have been 551 convictions for violations of the game and fish laws, and hundreds of fish nets and traps have been destroyed. There are 12,365 miles of running streams in Kentucky, which, under present conditions, produce considerably over one million dollars worth of food fish each year. This could be easily doubled if the laws of the State were strictly observed. The game wardens captured and destroyed 1,088 hoop and wing nets in one season; these nets were taken from less than 500 miles of stream, and each net of this type is estimated to take over 1,000 lbs. of fish a year, which means that these nets illegally took over one million and eighty-eight thousand pounds of fish annually.

DISTRIBUTION OF FISH.

The United States Government, through its Fisheries Department, has facilities for distributing fish to the various States, but they have refused to plant fish in territory that is not protected, saying it was useless

to liberate fish in waters not protected, so those States which had warden service and protected their streams got the bulk of the public distribution. But Kentucky is coming into her own, as the Government reports show 23,744,253 live fish liberated in Kentucky waters during the four years ending June 30, 1915, while the Kentucky Commission liberated 8,473 in the fall of 1914, and during the past year, since the purchase of the fish car, which was put in operation May 12th, the Kentucky Commission had, on October 1st, distributed 8,029,083 live fish, making a grand total of 31,781,809 fish placed in Kentucky waters in four years.

GAME BIRDS LIBERATED.

An experimental planting of 300 Hungarian partridges were liberated in fifteen counties of the State the fall of 1914, and in March of 1915, two thousand five hundred English ringneck pheasants were liberated, at least fifteen birds going to each county. Reports from seventy-three counties show an increase of 2,656 birds, which indicates a gratifying condition and places the number of these splendid game birds at liberty in Kentucky at something above six thousand.

The Game and Fish Commission has contracted for 10,000 Bob White quail, to be captured in Mexico and shipped under Government supervision into this country. These birds will be liberated in Kentucky during 1916; also 2,500 English ringneck and Reeves pheasants, to be imported from England in March, 1916.

The Federal Government has established a \$75,000 fish hatchery on property adjoining the State Fair grounds, which, with the permanent exhibit of the Game and Fish Commission and the State Forestry Commission's nursery of trees, adds much to the educational value and general interest of Kentucky's State Fair.

Communications intended for this department, inquiries, and applications for birds or fish, should be addressed to J. Quincy Ward, Executive Agent, Game & Fish Commission, Frankfort, Ky.

THE BANKER'S RELATION TO AGRICULTURE.

Address of Mr. W. F. Bradshaw, Jr., of Paducah, Member Executive Committee Kentucky Bankers' Association, Before Meeting of Groups 1 and 2 of the Association, at Dawson Springs, Ky.

Published through the courtesy of Mr. Arch B. Davis, Secretary, Kentucky Bankers' Association.

Mr. President and Fellow Members of the Association:

A discussion of agriculture and farming in public gatherings has given rise to a custom sanctioned by long usage, of approaching the question from either one of two aspects. The more ancient and respectable method of handling the question is for the speaker to draw an attractive picture of the beauties of the pastoral life; of the farmer as the man of all others whose life is marked by an independence, simplicity and beauty that no other enjoys; far removed from the turmoil and noisy strife of city life; free to live and do with his time as he pleases, the lord of his broad acres, and master of all he surveys, and whose cattle graze upon his thousand hills. One of the well beloved governors of Tennessee used to draw such a picture of the farmer's life, and for the moment made us all wish that we were back on the farm.

The other method of approaching the subject, a more modern and less respectable, but more popular one, is to draw first the picture of the golden age now past as the natural, inherited right of the farmer, and then contrast with it the picture of the farmer as despoiled of all his natural rights by the rapacious hand of organized and grasping wealth, and piratical industry, and urge upon the farmer that the only recourse left him from the degradation and despair in which he now finds himself, is to arise as a unit, destroy the whole existing order of things, reconstruct society anew, and the penetrating inference is left that when the era of reconstruction following that of destruction arrives, the speaker is the one

to whom the farmer should look as the divinely chosen agent for that work.

I do not intend to approach this question from either of the two aspects mentioned. In the first place I am not seeking the farmer's vote; I am not a candidate for any office, and if I were I would have too much political sense to be caught in a convention of bankers. Bankers are a hard-headed, unimaginative lot, who are little influenced by fervid oratory or rhetorical pictures of things as they ought to be. Their minds are essentially trained to deal with facts, with things as they are, however unpleasant and unattractive they may be. In fact, the better trained a banker is, the more quickly he wants to know the worst and to prepare himself to cope with the greatest difficulty which the facts may present.

When our forefathers settled this country they found it a vast uninhabited wilderness of apparently inexhaustible resources, and, acting on the appearance of these resources as inexhaustible, they began a settled policy of exploitation calculated in the least possible time to exhaust its resources. The whole nation seems from the beginning to have been seized with a monomania of trying to convert the material resources in the shortest space of time possible into the largest fortunes regardless of the amount of wasteful extravagance and destruction which such a policy entailed upon the sum total of our country's resources. Far-seeing economists and thinkers twenty-five years and more ago, began to point out to the nation in public addresses and written articles the rapidity with which we were approaching the goal of desolation by such a process. But only in the last few years, largely through the instrumentality of one of the most conspicuous and able Presidents of the United States, was this idea brought prominently to the forefront and took an abiding place in the thought of the people, and was crystalized in the phrase, "Conservation of our Natural Resources." The readiness with which the public seized upon this idea is significant of a peculiar characteristic of our Anglo-Saxon people. The conservation of natural resources means a preservation of the property values of the people. It was some years later before the attention of the people was directed towards

the necessity of a conservation of the people themselves in relation to the natural resources. In a word our government first undertook to protect our property values by withdrawing a large part of the public domain from exploitation, and several years after this step had been taken to protect the property values, the government directed its attention towards the protection of the people themselves against their growing poverty as the result of wastefulness by a nation-wide educational campaign in scientific and more efficient agricultural methods.

The older members of the Association who were present doubtless can remember the time when the average yield of wheat and corn from the lands of western Kentucky was from 50 to 100 per cent. greater than it is today; when the machinery and implements now in use in agriculture were unheard of. And yet as inventive skill has lessened the difficulty of agricultural production, the annual yield has lessened almost in proportion. This fact is true of almost the entire country. The once wonderfully productive prairie land of middle Illinois has been so impoverished by unintelligent cultivation during the last sixty years, that the annual yield is little over half what it was when the country was first thrown open to settlement. The working out of the problems of efficiency has always fallen upon the shoulders of the enlightened few. The solution of this problem has been undertaken by the various states, and by the United States, and the solution has been found, but the people have been slow to grasp the work that has been done for them. As the natural fertility of our soil has been exploited and wasted, the people themselves have fallen into careless and wasteful methods, and the economic position of the farmer has been rapidly lowered by reason of his lessening efficiency, until today one of the most tragic pictures in our whole economic system is the steady, inevitable lowering of the position of the agricultural classes.

It is this problem that to my mind makes the subject of this discussion, "The Relation of the Banker to Agriculture," a very live and very vital one. I am speaking particularly of western Kentucky. Agricul-

ture is by far the greatest of all the industries in western Kentucky; in fact, it is the greatest of the nation. The annual production of new wealth from agriculture is far greater than the new wealth produced each year from all the other sources combined. It is greater than the annual yield from mining, manufacturing, and even from transportation added to mining and manufacturing. Western Kentucky is essentially an agricultural community. Probably not less than four-fifths of all the new wealth created each year in western Kentucky comes directly from agriculture. In comparison the manufacturing and mining industries in western Kentucky are inconsiderable. And yet who ever heard of an organization of business men or bankers in any community in western Kentucky for the purpose of promoting, encouraging and fostering more efficient and more intelligent agriculture? In every one of our larger towns we have commercial clubs or boards of trade spending thousands of dollars to induce the location of factories or to support already established factories that are unable to survive. In other words we are spending our money to nurture the growth of an unacclimated industry, and neglecting the opportunity at hand to foster the growth of our greatest industry, for whose success we have within reach every element except the encouragement and teaching necessary for it to attain the maximum. And yet the remedy for the economic disease is prepared and ready to be administered. The solution of the problem has been worked out, and all that is necessary is for enterprise and intelligence to apply it to the affected part of our community.

There never has been a time, and I suppose there never will be a time when the banker will not be one of the conspicuously prominent members of his community. This is said not to flatter a meeting of bankers, because it is my purpose not to flatter you, but to point out to you wherein you have failed to meet the responsibilities of your position. You are conspicuous because you have been chosen by your fellow-citizens to be the custodian and the keeper of that which represents the successful issue of all their commercial struggles and hard-won battles. With you is deposited for safe keep-

ing their surplus wealth, the bread bill of tomorrow, as well as their wealth used each day in the channels of commerce, the fuel that keeps the commercial machine in motion. By a process of commercial selection and competition you have been selected as their trusted custodian because they have confidence in your integrity, and your willingness to serve them as the guardian of their wealth. Responsibility always carries with it a high degree of obligation, and you cannot evade the obligation or the duty by a refusal to recognize it, nor by indifferently ignoring it. Responsibilities are like poor kin; you can destroy the relationship by refusing to recognize them, not by ignoring them—they are there just the same, and if you try it your shabby conduct does not remove the sense of obligation from your conscience, nor avoid your being lowered in the estimation of your neighbors. I do not believe that there is a man before me, nor a banker in western Kentucky who would not gladly and cheerfully assume his part of the responsibility of his position, and give his time, his thought and his money to the meeting of this obligation and the performing of this great social service—a service that has a two-fold reward, first the consciousness of having frankly met a responsibility that attaches to your position, and having performed a service to your community, and secondly, the material reward that will come from making your community a more prosperous one, and of elevating your fellow-citizens economically and financially.

Without pursuing generalities or abstractions any further, I am going to tell you what an organization of business men in Paducah, prominent among whom are the bankers of Paducah, has done in meeting this responsibility in some measure of applying the solution of the question. Paducah has had for many years an open market maintained by the city for the purpose of offering a means to the farmers and particularly to the truck and provision growers of disposing of their wares to the citizens of Paducah. Truck gardening around Paducah had reach the point of an over-production for the local market, with the accompanying lessening of prices, and yet there was not a sufficient amount of the various products raised nor a co-operative organization

in existence for the handling of the surplus stock to ship to the city markets. In order to meet the situation, and to help our friends in the country, some of the members of the board of trade invited a dozen or more representative gardeners and farmers to a meeting in the board of trade rooms for the purpose of discussing an organization for the handling of garden products for the joint account of the growers and shipping them to the city markets. Three or four of the persons invited responded, and the unanimous opinion among them was that such an organization was impracticable, that the growers could not be interested, and that it was not worth while trying. While the matter was still fresh in the minds of the Paducah citizens, it was learned that the Southern Illinois Growers' Association was to have a meeting at Anna, Illinois. This association is about forty years old, and is one of the most successful of all such associations in the country. The board of trade then invited about a half dozen growers from the country as the guests of the board of trade to go to Anna, together with some of the Paducah business men and bankers, for the purpose of seeing the actual work of such an organization. Of course, this invitation was unanimously responded to. When the Board of Trade had something to give away without obligation on the part of its guests, either to spend any money or to do anything except travel and enjoy themselves, it was not difficult to get a meeting. The party went to Anna and there found assembled representatives from all through middle and southern Illinois. They heard addresses from some of the most distinguished agricultural experts in the United States. They saw the farmers who had in cultivation two hundred acres of rhubarb, over one hundred acres of asparagus in single tracts, farmers whose annual income in garden products and berries ran from \$10,000.00 per year upward; they saw owners of orchards whose annual income from their apples amounted to \$50,000.00 per year. They heard farmers in the convention discussing scientific and efficient means of preparation of the soil, of planting, of cultivating, of combating various plant diseases, and using the technical and scientific language of their business

with the ease and understanding with which the banker uses the terms of bookkeeping and accounting. They saw a chart on the wall of the convention room showing that over one million, sixty-six thousand dollars (1,066,000) had been deposited in the banks of Anna alone by members of the Association in the neighborhood of that little town from garden products marketed during the months of June, July, August and September, 1913—one million, sixty-six thousand dollars of new, fresh money, which had never been spent by anybody in Anna before, and had never been in that country before, all drawn directly away from St. Louis, Chicago, Indianapolis, Detroit and other market centers to which that Association shipped the goods of its members. They found that organization equipped with a receiving depot for its members at every shipping point. That the members had learned how to sort and pack their products for the city markets, that the handling, shipping and accounting all done through the Association was at such a small cost that the percentage is negligible; that there were no middlemen, and that the producer got practically the maximum city prices for his goods. They learned that the farmers and truck growers were the most prosperous men in the community, that the banks were loaded with their deposits, and that the farmers themselves had loaned out thousands of dollars at 4 and 5 per cent. interest. The guests of the board of trade instead of staying one day, stayed until the meeting was over, and when they came back they began to spread the news. You all know how news spreads in the country. In four or five days it was all over the country. As soon as it had soaked in, another meeting was called by the Board of Trade for the purpose of taking up the question again. At this meeting the assembly room at the board of trade was crowded. Talks were made by several persons present, and another meeting was arranged for. Then followed a series of meetings before which appeared representatives of the agricultural department of the Illinois Central Railroad, and various other public-spirited and enlightened speakers upon the question of a growers' organization.

It was the good fortune of the Board of Trade at this juncture to have Dr. Fred Mutchler, a representative of the Federal Department of Agriculture, as well as of the State Department, in charge of the work of both in Kentucky, to be present and address one of the meetings. This was an overflow meeting at the court house at which several hundred were present. At the conclusion of this meeting a list of names was taken of those who were willing to express themselves as sufficiently interested in the movement to be identified with it in the event of an organization, but still without obligation on their part to pay anything or do anything. In the meantime, those who were instrumental in starting the movement had made their plans to raise a fund by voluntary subscriptions from the banks and citizens of Paducah, and those of the country who were willing to contribute of from \$4,000.00 to \$5,000.00 per year to be subscribed for not less than three years. Dr. Mutchler asked for a conference of those in charge of the organization, and stated that he was much impressed with the fact that this matter had been taken up by the business men and bankers of the city; that he liked the spirit shown by them of desiring to lend their assistance and experience in organization to agricultural interests of the country; that he believed that if the organization were willing to place its work under the direction of the State and Federal government, that he could get an appropriation from the Federal Department of Agriculture to be applied on the salary of the County Agent, who should have charge of the instruction and general work of the organization. Of course, the organization committee was delighted to have the benefit of the intelligence and experience of Dr. Mutchler, and he was authorized to select any agent that he was willing to recommend for the work, and that such arrangements as he desired would be made for the work to be done under his direction. An appropriation of \$1,200.00 was then obtained from the fiscal court of the county to be applied on the salary of the county agent. This with the \$600.00 paid from the government for the same purpose was more than sufficient to pay the salary of the County Agent. The McCracken County Growers' Association was then organized as a corpora-

tion without capital stock. Any person in the county or city is eligible to membership. Subscriptions are voluntary, and any person subscribing \$1.00 or more is entitled to vote as a member in the selection of the seven directors of the association. The directory for the present is composed of four members elected from the city of Paducah, and three growers from the county. The association was fortunate in being able to select as its President a man who for twenty years was engaged in the wholesale grocery business, and is familiar with the selling and marketing end of the business, and who for the last few years has, after having retired from the grocery business, himself become a grower, and is one of the most successful producers in the country. The association was well under way in the early spring. Its work for the first year will necessarily be preliminary, and fruitful of comparatively small results in a material way, but it has accomplished this much, it has a membership of over 150 growers and producers. It has pledged about 500 acres of garden truck for the present year from its members, and up to the first of May over 50,000 apple trees had been delivered to its members and planted in the county through the association, and which were bought by the association for the members at about one-fourth what its members had heretofore paid to fruit-tree peddlers for the same trees. But more than this, the movement not only has the sympathy and the well wishes of everybody in the city and the county, it has the enthusiasm and determined support of its members, and in a few weeks has broken down the old spirit of distrust, petty jealousy and despair over the hopelessness of the cultivator of the soil really being able to better his condition and to share materially in the welfare of his community.

As I stated to you, I was going to confine myself to the facts, and, therefore, what I am going to say now I am saying not as a prophecy, but I am stating it to you as a fact; that this association during the first year of its existence and by the time the fall market season is over, will have brought into the pockets of its members over \$50,000.00 of new money coming into this community from cities and markets at a distance, and which

would not by any possibility have gotten here except through the association. And inasmuch as I am confident of the continued existence of this association, I believe it no prophecy to measure its success by that of other similar associations, because our people are just as intelligent and just as industrious as those in Southern Illinois, and when shown the way can accomplish just as substantial results, and I believe that I can say not as a prediction, but as a fact, that this association will increase its income each year after the other for the next five or six years, by not less than from seventy-five to one hundred thousand dollars.

We do not claim in McCracken county to have solved anything. What I have told you is a detailed statement of what may be considered one small step in the right direction. The ultimate solution of the question depends upon the continued support and interest of the members of the organization and of the citizens of the city and county. Of this interest I feel little doubt, and it is my firm belief that a few years of progress in the direction in which this movement is started, will have contributed largely to the solution of the agricultural problem in our community.

What has been done in McCracken county can be done in every county in the State. McCracken county is no favorite county. Although the State government has a well equipped agricultural Department and makes a large appropriation for its maintenance, and although the Federal Government has the best equipped agricultural Department in the world, with the largest agricultural appropriation, and the best talent obtainable, and has at hand a solution for nearly every serious agricultural problem, neither the Federal Government nor the State Government are automatic institutions that can be set in motion by inactivity and inert complaining. The benefits right at hand to be used can be had only by seeking those benefits and by displaying a sufficient amount of sustained interest, intelligence, and determination to bring into play the agencies of the State and Nation. When this is done in any community you may be assured that that community will receive its fair consideration. But there are too many communities eager-

ly, anxious and aggressively seeking this assistance for the backward or inert community to expect consideration. This is not a matter that can be handled by the Bankers' Association as a State-wide organization. It is a problem for the individual bankers in each community to interest themselves in. As one of those citizens whose position of responsibility attaches to itself an obligation of social service, I believe the bankers of Kentucky will not be backward in meeting and assuming this responsibility, and rendering what service they can to the material and educational spirit of their communities and their fellow-citizens.

It is to be earnestly hoped that the future history of the uplift and rehabilitation of agriculture in Kentucky will record the fact that the movement was initiated and led by the bankers of Kentucky.

HISTORY OF THE PIG CLUB WORK IN KENTUCKY.

Pig Club work was introduced into Kentucky September, 1914, with the Bureau of Animal Industry cooperating with the Bureau of Plant Industry, and the Kentucky College of Agriculture, as a unit of Farmers' Demonstration Work. In 1915 the following thirteen counties were organized with their county agents cooperating:

S. E. Puckett.....	Christian County
J. Robert Bird.....	Crittenden County
Jas. R. McDanell.....	Gallatin County
P. D. Brown.....	Henderson County
Chas. L. Taylor.....	Hopkins County
F. E. Merriman.....	Jefferson County
Horace E. McSwain.....	Knott County
Robert F. Spence.....	Madison County
P. D. Bushong.....	Metcalfe County
E. H. Faulkner.....	Whitley County
G. A. Smith.....	Pendleton County
O. F. Floyd.....	Woodford County
W. W. Johnson (School Board).....	Boyle County

Six hundred and fifty eager boys and girls became members and agreed to carry out the rules. Some of the members this year could not get a pig; some dropped out; others raised their pig, but turned in no report, but most of them stuck to it with excellent results.

A boys' pig show and contest was held in each county, and ribbons, special and cash prizes were given to the winners by business men and bankers, the initial prize for each county being a free trip to the Farmer Boys' Encampment at the Kentucky State Fair, all expenses paid. This was given by the State Fair to the boy in each county making the highest total score as follows:

(a) Best hog with respect to purpose it was to serve.....	40%
(b) Greatest daily gain on hog.....	15%
(c) Cheapest cost of production.....	25%
(d) Best kept records on feeding and care of the hog.....	20%
Total	100%

Sixteen boys from different counties won this trip at the expense of the State Fair:

Noel Lea.....	Bracken County.....	Brooksville, Ky.
Forrest Minor.....	Boyle County.....	Perryville, Ky.
Wm. Henry Sutton.....	Woodford County.....	Versailles, Ky.
John Clinton Woodward.....	Jessamine County.....	Wilmore, Ky.
Tom Jones.....	Knott County.....	Mallie, Ky.
Ernest Minner.....	Crittenden County.....	Marion, Ky.
Presley W. Ray.....	Metcalf County.....	Edmonton, Ky.
Homer Martin.....	Daviess County.....	Owensboro, Ky.
Wm. Owen Stinnett.....	Hopkins County.....	Madisonville, Ky.
Gordon Nelson, Jr.....	Christian County.....	Hopkinsville, Ky.
Robert Landrum.....	Gallatin County.....	Warsaw, Ky.
Lona Fish.....	Madison County.....	Berea, Ky.
Ray Jones.....	Whitley County.....	Williamsburg, Ky.
Halbert Smith.....	Whitley County.....	Williamsburg, Ky.
Roscoe Ewing.....	Pendleton County.....	Morgan, Ky.
Wallace Courtney.....	Scott County.....	Versailles, Ky.

These boys were given a short course in agriculture, consisting of lectures, judging contests, etc. Not only were the boys present, but eighteen of their pigs were there. Although small in number, the quality of these pigs and the interest of their owners compelled the attention of the visitors to the swine barn to a very large degree. Several hundred dollars in cash and special prizes were offered by the Commissioner of Agriculture

and Swine Record Associations. These were hotly contested for and afterwards most of the hogs were sold to the packers for a premium of 25c per cwt. above the top market.

Gordon Nelson, Jr., a Christian county pig club boy, not only won high honors among the boys, but took the blue ribbon in the junior yearling sow class from the Poland China breeders of several States with his club pig, "Lady Wonderprice." Through the courtesy of the State Fair, boys had their separate classes and were also allowed to enter the farmers' classes.

An illustration of the forcible demonstrations in feeding made by these boys was brought out in the exhibit of Moser Brothers, two pig club boys of Jefferson county. These boys took two pigs from a litter, and the father a third one. The three were in the same pen, the father's pig weighed 95 lbs., and the boys' pigs 215 and 220, respectively. The sons' only cost them 4½ cts. per lb. to make their hogs on a balanced ration, while the father has no idea of the cost of his runt, the product of "corn alone" feeding.

This small demonstration was but a minor part of the valuable work accomplished through the pig club by County Agent Merriman, of Jefferson county. His report shows 15 boys having fed 15 pigs for an average of 88 days, the total initial weight being 1,042 lbs.; final weight 3,058 lbs.; total gain 2,016 lbs., or 1.53 lbs. per pig per day. These hogs were fed balanced rations that cost \$114.90 for the total feeding period, or 5.7c per lb. gain. The initial cost of these hogs at the June market price was \$70.00, making \$184.90 total expenses. Three-fourths of these hogs were sold at \$8.15 per cwt. September 15, 1915. Had the boys all sold their pigs, the total selling price would have been \$249.23, or a total profit of \$64.33 for 15 hogs fed 88 days, which is slightly over \$4.00 per hog. No value here has been put on the manure or the higher prices procured for the feed stuff.

The value of such home demonstration work is made clear in the following letter to Mr. Merriman from the father of one of the boys (the original copy of which can be found in the office of the Louisville Commercial Club) :

St. Matthews, Ky., October 1, 1915.

Mr. F. E. Merriman,
Louisville, Kentucky.

Dear Sir:—

I am writing you to let you know about the big lesson my son Henry and I have learned about hog raising since you started the Boys' Pig Club. Of course, you know I live in the potato section of Jefferson County, and the largest part of my farming consists of raising potatoes.

We were glad to have the boy join the pig club, and purchased a pig at your suggestion on June 26th, which weighed 43 pounds. When you said that we could feed this pig in such a way that it would weigh 170 pounds by the State Fair time—which was some 70 days' time—I did not say anything, but could hardly believe that it was possible, and my wife and I thought that you were talking through your hat.

I have learned a whole lot about feeding a pig, for instead of making 170 pounds, it made 180 pounds; doing more than what you said it would. Although we did not get any silver cups or cash prizes at the State Fair, we feel that we got the largest prize of them all—that of learning how to feed a pig profitably, and we are well satisfied.

I raise a few hogs every year for my own meat, and sometimes have a few to sell the last of November. About this time I get some more pigs around three months old, keeping them until the next year, making one year's time for the pigs to be fed. I have tried all kinds of ways to feed these hogs in order to get them to weigh 250 pounds, and still make a profit. Each year they have always cost me more than I could get for them.

From now on—I am glad to say—I shall have some hogs to sell every six months, and I will feed them the same as we fed the pig in the Boys' Pig Club. From now on I am not going to throw all my corn away, getting little or no profit from it, but shall feed a balanced ration. I feel that this method will make us some money.

Little Henry has not given up because he did not win prizes this year, but is determined to use the experience which he gained this year to win some of the silver cups with next year.

Yours very truly,

(Signed) HENRY REULING.

Almost every county could show the above demonstration.

Next year pig club work is to be taken up with 26 agents, each agent to supervise but 15 or 20 boys. We have already inaugurated a campaign in Knox county for pure-bred hogs and community breeding. The Farmers' State Bank, of Barbourville, has purchased \$200.00 worth of pure-bred hogs, and given them out to pig club boys under contract that they shall remain members of the pig club for two years, feed and care for these hogs under the direction of the county agent, and register all the progeny from their original gilt, unless

sold for immediate slaughter. The boys agreed to give back two choice gilts from the first litter to the bank, who will in turn put these gilts out to two other boys under the same contract, thus not only giving us a chain system of promoting the pure-bred industry, but at the same time distributing but one breed in the county, which we hope will ultimately result in community breeding.

The objects of the club are to stimulate an interest in swine production, and to demonstrate how to raise more, better and cheaper swine by the use of pure-bred stock, balanced rations, and forage crops; and to instruct these boys in a practical way in the management, feeding, sanitation, and prevention of diseases in swine; to instill in them while young the love of animals, which will result in more and better hogs, becoming interested in country life, and to learn the business side of farming.

Small prizes are offered, and may be well given, but every boy is urged to learn and to do all within his power for the betterment of wrong conditions. The winning of prizes is secondary, for that in itself is not of great value, but the energy, learning and faithfulness necessary to win the prize, is of immeasurable importance.

The pig club work as it is being carried on in Kentucky is but an example of what the Government and State colleges are doing in thirteen other states. It is a wonderful work, both for the making of future farmers and the development of the swine industry. The boys entering these contests are required to weigh the pigs at the start of the work, keep careful records of the weights of feed fed, monthly gains the pigs make, cost of gains and net profits. The educational value of such work cannot be overestimated. It should have the support of everyone, and it is to be hoped that some day credit for such work may be given in our rural schools.

OTIS KIRCHER,

Agent in Animal Husbandry, U. S. Department of Agriculture. In charge of Kentucky Pig Clubs.

THE GROWING OF SUNFLOWER SEED.

This Department has had several letters making extensive claims for the possibilities for growing sunflower seed in this State. Knowing that the Fulton County farmers had experimented with this crop to a considerable extent, we wrote to Mr. C. T. Beale, of Hickman, Kentucky, for information as to the success of this undertaking. He writes that in this part of the State, and particularly in Fulton county, the growing of sunflower seed has been given more or less attention during the last two years, with varying degrees of success. While the lands in Kentucky seem well adapted to the growing of this crop, the crop itself has not, as yet, proven very successful or remunerative, and the production of seed thus far amounts to but little in this State. It is claimed for the crop, however, that it can be grown on ordinary corn land, and that while the yield per acre is not materially more than that of corn, when figured on a cash basis, the cost of planting and harvesting is much less and that the crop under favorable conditions will be a good one to adopt in a diversified system of farming. One trouble which has been experienced in Fulton county during the past season, was the effect of the wind. The sunflower, unlike corn, will not rise after being blown down. The seed will remain on the ground, and soon become unfit for the market, and from this cause a great deal of the crop was lost last season.

To grow sunflowers, the soil should be fertile, and of the same nature as the soils usually devoted to corn. The seed should be drilled with a corn-planter in rows four feet apart, and the plants thinned to two feet in the row. The planting may be made from April to July, and the cultivation is practically the same as that of corn.

Occasionally the rivers overflow some of the best bottom lands in western Kentucky at a season too late for the replanting of corn, and then the sunflower plant can be profitably substituted. It does not take quite so long to mature as the corn crop. Where only a limited amount of this crop is raised, it is gathered by simply cutting the heads from the stalks, and beating the seeds

out in wagon bottoms. Where raised on an extensive scale, machines are used for the threshing of these seeds.

Care should be taken in the selection of seed for this crop, as there are varieties of sunflowers which have several heads to the stalk, and others which have only one head. The latter variety is preferable, on account of its lighter weight. The stalks with four or five heads are more easily blown down. It is claimed by some growers of sunflowers that the seed is not damaged by reason of being on the ground for many days, but it has been found in Fulton county that seeds which remain on the ground for several days are unfit for the market.

As an emergency crop, the sunflower will, no doubt, be found of good value, and under the right weather conditions will prove profitable. While it does not rank as one of the staple and dependable crops of western Kentucky, the increased use of sunflower seeds for chicken feed, and as a source of obtaining oil for the manufacture of certain soaps, indicates the possibility of an ultimate demand sufficient to justify more attention to its growth.

PRODUCTION OF HONEY IN KENTUCKY.

By E. E. Barton, Falmouth.

The honey crop is produced by professional bee men, farmers and suburban and village residents throughout the State, and also by gathering the honey of wild bees domiciled in trees and other recesses, where the "robbing" is usually accompanied by destruction of the swarm. No estimate can be made of the amount of wild honey gathered, but a considerable quantity is obtained in this way.

The largest part of the honey crop is produced by keepers of only a few colonies of bees, and much of this is consumed in the immediate locality. However, on account of the great number of small bee keepers, a considerable amount of honey is produced by them in the

aggregate for the outside market. By far the largest yields of honey per colony of bees is obtained by the professional bee man. With modern equipment and proper management of the apiary, a yield of 100 to 200 pounds of surplus honey per colony of bees is obtained during a favorable season, while 25 pounds per colony is about the average for the State. Something like one-half of the commercial crop of honey is from the apiaries of the professional bee men.

According to the census of 1910 one in seven Kentucky farms reported having honey bees, and the average was about five colonies per farm. The State then ranked twelfth in the amount and value of honey produced. Since that date great advancement has been made in the number of colonies, the total honey crop and amount produced per colony, as well as a large increase in value of the investments in bees and equipment. In 1915 the honey crop is estimated at 5,000,000 pounds, with the State ranking third or fourth in amount and value of honey produced.

The largest honey producing section is the hill counties of Northern Kentucky bordering on or near the Ohio River from about Maysville to Carrollton. Seventy-five per cent. of the crop in this section is obtained from sweet clover, about 15 per cent. from fall aster, and the remainder from white clover, alsike, the blossoms of fruits, wild herbs and some forest trees. This section produces about one-half of the State's commercial crop. In 1915 Pendleton county with 5,000 colonies produced 500,000 pounds of honey above what was consumed locally. One-half of this amount was produced in about thirty large apiaries—one apiary alone producing 40,000 pounds during the season, with an average of nearly 200 pounds per colony. The honey crop is marketed in three forms, namely: extracted honey 50%; section honey, 35%; and "Chunk" honey, 15%.

Beeswax is an important commercial product of honey bees. The amount produced varies considerably with the form of honey marketed, as little wax is saved where it is sold as section or "chunk" honey. Some seasons the amount of wax produced is over 50,000 pounds. The rearing of queen bees for breeding pur-

poses is made a specialty in numerous apiaries of the State, and the strains produced here are very highly esteemed by bee-keepers everywhere. The queens are sent through the mails in tiny cages to all parts of the world.

It would be difficult to estimate the investment in honey bees and equipment within the State, as some bees are housed in crudely formed hives or in plain boxes, while most professional bee men have invested in modern patent hives, honey houses, labor-saving machinery and other equipment. These men have an investment of about ten dollars per colony, while with others it varies from two to ten dollars per colony. It would be safe to place the value of honey bees and equipment within the State at several million dollars. This investment and the industry itself has been seriously menaced by the presence of a contagious germ disease of the young bees in the larval stage called "foul brood." It does not affect the quality or usefulness of the honey, but soon depletes the swarm by killing the young brood being reared to take the place of the worker bees as they die. In some localities this disease has effectively been checked, and in some places almost eradicated by the work of the county bee inspectors. Suitable precautions upon the part of bee keepers, and proper inspection and treatment will effectively put an end to this trouble. The value of the industry, and the delicious and wholesome qualities of honey as a food product, would justify every reasonable effort to provide suitable protection in the way of inspection and treatment of bee diseases.

THE DAIRY COW.

By J. J. Hooper, Head Department of Animal Husbandry (Horses, Dairy Cattle, Poultry), Kentucky Agricultural Experiment Station, Lexington, Kentucky.

Everyone should accord the dairy cow premier place among farm animals, as she is the most efficient and profitable animal that a farmer can select. When fed a

hundred pounds of digestible matter, she produces eighteen pounds of human food, while the pig produces fifteen; the hen five, and the sheep and steer only three pounds.

In the round of a year a first-class cow will produce material in her milk sufficient to build up the bodies of three steers, each weighing twelve hundred pounds. The product from the cow is for sale every day, while the carcass of the steer is marketed but once. This serves to make money come to a dairy farm regularly each week or month. The dairy cow is economical in human food production, because her purpose is to produce milk to be fed her young offspring, and she gives of her substance and resources with the same unselfishness and self-abnegation that we find evidenced in the case of the human mother. The steer selfishly places his gain under his hide for future use, when the blasts of winter call for their extra toll of warmth.

Twenty-five years ago the beef cow held full and undisputed domain in our blue grass pastures. Then the little mild-eyed Jersey cow made her debut in Shelby county. Many wise heads were shaken in denoting that this kind of cattle would not do, and it was said that they would surely contaminate the good blood of the fine Shorthorn herds. But wonderful changes were to take place before the very eyes of the breeders of Central Kentucky. The dairy cow by her efficiency and profit has all but supplanted the beef cows that had to be kept a year for a calf, and that calf was the only salable product from the cow. As feed increased in price, it cost more to keep a cow, and as a result the cost of keeping beef cows to produce steers became unprofitable. A few farmers thought they could offset the disadvantage suffered by the beef cow by milking her for all she was worth, and occasionally we find a dual purpose herd where calves and milk are both produced for sale. But the dairy cow is so much more economical in milk production, and produces so much more per week and year and year after year, that she is continuing to supplant the cow that carries beef breeding.

Creameries and butter factories are being established in or near every community in the State, and a

gallon of milk or cream is as marketable now as a bushel of grain. Cows are being imported by the hundreds and thousands every year, and silos are being erected on all sides. Ultimately Kentucky is destined to rival Wisconsin and Illinois as a dairy section.

For the most part our breeders favor Jerseys, but occasionally a herd of Holsteins and Guernseys is to be seen. A good dairy cow will produce a profit of \$30 or more per year, while a feeder is highly gratified if he can net \$10 per head from steers. Years ago the farmers and the hired help balked at milking, and the general hard work incident to dairying, but the profit and the thrifty atmosphere around the dairy farms soon converted the most obstinate to the fact that the dairy cow is the most efficient animal that can come to a farm. It is to be noted that the dairy farm contains the best farm buildings in the neighborhood, and the fields are most productive.

Some farmers can not use the dairy cow because she does not fit in with the operation of their farms, and in other instances farm labor is not fitted to handle a dairy. But many who formerly offered these objections are now adopting the dairy cow.

We have known of many farms that have served as illustrations of thrift and profit, but none illustrate these points better than an eighty-acre farm that we recently visited in Central Kentucky. This farm serves to show how profitable and dependable the dairy cow is, when properly and intelligently handled. It is needless to say only good cows have found a home on this farm of eighty acres. This farm was purchased by the present owner seventeen years ago. The land was very much depleted owing to continued grain cropping. It could not produce a first-class crop of corn, and the neighbors told the purchaser that he could not make a living for his family of two sons and a daughter from it. He has not only made a living but has laid up considerable money in the bank and has lived well. At present he has an automobile for delivering milk to city patrons five miles distant, and another automobile for his family. This indicates that he has used up-to-date machinery, and progressive methods, and has lived better than most people.

The eighty acres are well tilled, and are given heavy applications of manure produced by the thirty-six head of dairy stock and four work animals kept on the place. The other stock consists of three hundred hens which yield a net income of one dollar per hen in the form of fresh eggs which are retailed to regular patrons, and delivered by the driver of the milk wagon. The eggs are sold at current prices quoted by local grocerymen. Three brood sows are kept, and they furnish considerable pork for family use. Six thousand dollars' worth of milk, butter, eggs and pork were sold last year, but this year the sales are to be increased to seven thousand dollars. The cost of operating the farm is deducted from this amount.

At the time of our visit last summer, the farm was devoted to the following crops: one fourteen-acre field of corn and sorghum used for family silage; another field of silage corn and sorghum; forty acres of pasture, and three acres of well-kept orchard which contains beautiful trees that are full of apples of the Stark, York Imperial and Ben Davis varieties. The lawn about the house and barn lots contains three acres.

On June 1st this progressive farmer cut fourteen acres of barley and put it in the silo. The silage from this crop was fed from July 5th to September 1st, and because of the rather small acreage devoted to pasture, the barley silage was useful. The dairyman stated that it raised the milk yield of his cows one gallon to the cow each day, and the chickens were fed some too, and they increased the egg yield. The barley silage was sweet, palatable and relished by the cows as we can personally testify, as we examined it. The grain was in dough stage and the barley contained considerable grain. Corn was planted on the field from which the barley was removed as it is customary on this productive farm to make the land yield a maximum of feed, and the corn made a heavy crop of silage. The fourteen acres furnished sufficient green barley to fill a hundred and twenty-ton silo. The barley, when cut for silage, which was as high as a man's hip, was estimated to contain forty bushels of grain per acre.

This dairyman took a preference to the glazed tile silo, and purchased the blocks for a sixteen by thirty-foot

silo from a local sales company. It was ordered by another farmer, but was not taken by him upon the arrival of the blocks. The blocks cost only \$285, but upon purchasing a second silo, the blocks cost \$332 delivered at the railway station. In erecting the first silo local bricklayers were employed, but they did not prove entirely satisfactory, as in one round they failed to break the joints of the blocks, and in the second they failed to make the blocks complete the round, and filled in with a brick in two places. The blocks were not laid as smoothly and flush as they should have been. In erecting the second silo, the dairyman's son did the work without difficulty, and it was entirely satisfactory. He did a fine job, fitting the tiles in place perfectly, and not bulging the walls at any point. Both of these glazed top silos will be used in the future. The second silo is sixteen by thirty-three feet in size, and the blocks for it cost \$332, while the first silo which is sixteen by thirty feet cost, complete with roof, shute and walls, \$427. The son, who is twenty-five years old, has also built a concrete wall in the cellar of the farm house, and he laid the blocks in the new milk room, which is illustrated in the half-tone printed in connection with this article. It was first planned to build a milk room of twelve by eighteen feet after the blocks had arrived. To make up for the deficiency in blocks, the foundation wall, which was constructed of concrete, was built two feet above ground, and the blocks laid on top of it. The blocks for this glazed tile milk house cost \$37.50 delivered at the railway station. The farmer told us that the shingle roof, the doors and windows, ran the cost up to \$150 for material for the house. Labor of building was additional to this cost.

This dairyman likes the glazed tile construction so well that he has begun the erection of an ice house, which is to be built nine feet above ground, and about five feet into the ground. It will resemble a low silo.

Recently we were asked to present a set of figures relative to the profit that might be expected from a hundred-acre dairy farm. We figured that a progressive man might make fourteen hundred dollars profit from such an acreage in the course of a year. We wondered if we had figured it correctly, taking for granted that the

land was fertile, and the milk was to be sold at sixteen cents a gallon. In our visit to this interesting small farm, we found a farmer doing as well on eighty acres, but getting a higher price for milk. When we visit such farms we are almost convinced that this honest, able, energetic and thrifty farmer was right when he said "Most farmers have too much land and farm it badly."

FORAGE PLANTS.

BY

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The word forage may have a somewhat bookish and scientific sound, but it is a good English word, which the farmer can use to advantage at times in discussing problems with which he deals every day. We understand by it simply feed for stock—corn, oats, hay, silage, pasturage. Any food is forage, either for man or for beast. But we are accustomed to style what we eat ourselves, foods, and what our animals eat, feeds, though in many cases foods are also feeds, and in some it would be difficult to say whether we received most benefit from the food provided us by a forage plant, or from the feed it furnishes our animals. Corn is an example. It is a splendid feed, and an excellent food. Oats is another. Even wheat which we are accustomed to regard as our own special food plant, often provides grazing for stock, and in the form of bran a nourishing feed. So it is impossible to draw a line between forage for man and forage for beast.

Yet we are accustomed to speak of forage as feed for stock, and I shall endeavor in what follows to restrict myself very largely to those plants having value as feed for the animals kept on the farm.

While many plants of widely different plant families furnish some feed, two very distinct families pro-

vide most of the forage used throughout the world. It is questionable, indeed, if we could continue long on this earth if both families were suddenly removed and rendered forever extinct. These families, as you already know, are, first, the great grass family, and second, the equally great clover family.

To bring clearly before you the immense value of the grass family to us, I want to remind you of a few important grasses. Corn, wheat and oats have already been mentioned; they are true grasses. Rice is a typical grass. Rye, barley, all the millets, kaffir corn, sorghum, (the cane from which sugar is made farther south), timothy, blue grass, red-top, Bermuda grass, are all familiar examples of the same family. The bamboo of India and other eastern countries is a most valuable building material, and many of the dwellings, all of them in some sections, are constructed of the stems of these giant grasses. They make beautiful and very durable furniture; also, are employed in making ladders, rafts, arrows, fishing rods, etc., and besides on rare occasions, when they produce seed, furnish man a wholesome food. Bamboo in large sections of the east is the most valuable plant known, and is a true grass.

A more familiar standard of measuring values may help a little further in grasping the importance of grasses to us.

We do not grow much rice compared with eastern countries, the \$16,624,000, at which the 1910 rice crop of the United States was valued, being a relatively insignificant matter when all our crops are considered. Yet rice feeds about one-third of mankind, and the yearly product of Japan, China and India amounts to about 100,000,000 tons.

Let us consider some familiar grass crops of real value in the United States. Our corn crop furnished more food and forage in 1910 than any other crop we grew. It is by far the most important crop grown in this State. The value of the crop on the farm for the whole country was estimated by experts connected with the United States Department of Agriculture at the enormous sum of \$1,523,968,000. Our wheat crop for 1910 was estimated as worth on the farm \$621,443,000.

Our oats reached the value of \$384,716,000. Our rye was valued at \$23,840,000. Our barley was estimated at \$93,785,000. Our hay crop was worth to the farmers of this country \$747,769,000.

Taking all these grasses together, but omitting our sorghum, cane, kaffir corn, and miscellaneous grass crops of which I have seen no estimate, we produced grass forage for man and beast in 1910 to the value of \$3,412,145,000.

In Kentucky alone our corn crop meant to the farmers of the State a value of \$55,793,000. Our hay crop meant \$8,450,000 more, and, including all of which we have estimates and estimating our pasturage as worth as much as our hay, Kentucky produced grass crops in 1910 having a total value to the farmer of \$83,693,000.

We hear a great deal nowadays about our tobacco, but Kentucky's tobacco crop for 1910 did not equal her corn crop alone by \$22,643,910.

TABLE SHOWING VALUE OF GRASS CROPS IN THE UNITED STATES FOR 1910—FROM UNITED STATES CROP REPORTER.

Corn	\$1,523,968,000
Wheat	621,443,000
Oats	384,716,000
Barley	93,785,000
Rye	23,840,000
Rice	16,624,000
Hay	747,769,000
Total	\$3,412,145,000

TABLE SHOWING VALUE OF KENTUCKY FORAGE IN 1910.

Corn	\$55,793,000
Wheat	8,928,000
Oats	1,912,000
Barley	16,000
Rye	144,000
Hay	8,450,000
Pasturage	8,450,000
Total	\$83,693,000

If our grasses are the equivalents of these tremendous sums of money, if they mean the bulk of the profit each year from crops harvested in all countries, if they mean by far the most important part of food supplied

by plants to man and beast, is it not a little surprising that we should know so little about them, that so few of our people should have definite ideas as to what the grass family means to mankind?

Suppose we take a familiar grass and examine it carefully to see how it differs from other plants.

The common oats will serve as well as anything. One of the first features to attract attention when we compare this plant with a sunflower or petunia is that its stem is jointed, and that it is, as in many species of grasses, hollow. Here is a character by which the grasses may be separated from the clovers, and most other plants. The leaves of a grass, again, are ribbon-like or threadlike, and the veins are parallel, never netted, as are those of a maple or clover leaf; and here we have another character by which a grass may be recognized and distinguished from most other flowering plants. The flowers of grasses, to take another feature, are small and not brightly colored. You have but to recall the timothy tops and blue grass tops to get the idea. The flowers have the necessary parts found in the rose and tulip, but they are small, and are ordinarily concealed by the small greenish chaff. Each timothy top and blue grass top when examined with a magnifier is found to bear large numbers of these small flowers hidden among the chaffy protective envelopes, much as the corn ear is hidden by the husks.

Now, the showy flowers like those of clover are more or less dependent on the insects for pollen, and if it is not brought from other plants of the same sort, many of them produce few or no seeds. In the case of the grasses, we say they are wind pollenized, because the pollen grains are carried by the wind and insects have little to do with it. This is why it is so difficult to keep corn and other grasses pure. Pollen from different varieties is widely scattered in the air, and hence we often find red or yellow grains mixed with the white grains of a white variety. So, again, in the case of blue grass it is almost impossible to find fixed varieties because of the wide sowing of the pollen of these plants by the wind.

Bringing all our characters together, we may say that a grass is a plant with a jointed, and generally, hollow stem, narrow parallel veined leaves, known as blades, and small flowers assembled in spike-like heads or loose, widely branched clusters known as panicles. Grasses may mature and die in one season, in which case they are known as annuals, of which corn and Hungarian millet are examples, or they may last from year to year, as in the case of blue grass, when they are known as perennials. They are wind pollenized.

Grasses occur everywhere on the globe where man can live in anything like comfort. They are to be found well up toward the north pole, barley and oats growing as far north as 70° north latitude. The best of grasses for grazing, you will remember, are of rather northerly distribution, or, in other words, cool weather plants, making their best growth during early spring, like our blue grass, and again in fall after the heat of summer is past. As we go southward from Kentucky, the turf-forming grasses become less common, and their place is taken by the tall, rank-growing sorghum, canes, etc., which make their growth during the heated periods of the year.

Kentucky's reputation as an agricultural State is due to her pastures, and to the horses and cattle which her pastures produce. And because of the excellence of the pasturage in some parts of the State, her reputation extends even outside the limits of the United States. Foreign countries not infrequently send men to Blue-grass Kentucky to buy horses and to study our methods of raising such stock.

Yet if Blue-grass Kentucky were omitted as a part of our territory, there would be fully four-fifths of the State left which could scarcely be called a grazing country at all. The making of Blue-grass Kentucky and the reputation of the whole State thus depended very largely on one little grass plant, the *Poa pratensis* of botanies, the Kentucky blue grass of the whole world.

I do not wish to be understood as implying by this that Kentucky blue grass is a native product. This seems to me doubtful. It occurs throughout much of the world, and is claimed to be native to European countries.

But it attains a very great excellence of growth here, and was introduced so early that we have been led to regard it as our own.

To express the value of the forage grown in Kentucky, it may be said that putting all our other crops together and omitting our stock, which is absolutely dependent on forage, yet they will not equal the value of our corn and forage. I am not forgetting that the tobacco crop of Kentucky for 1910 was valued at \$33,149,088.

CLOWERS AND THEIR ALLIES.

I have been dealing thus far with the true grasses, with jointed stems. But any treatment of this subject, however slight, would be very imperfect if the second group of forage plants were omitted. Every farmer worthy of the name, recognizes the value of clover. It has been the dependence of many of them for years.

Clover is no grass. We sometimes call plants of its family legumes, because of the peculiar pods in which many of them produce their seeds. The family, including clovers of various sorts, is a large one; with many other plants, it is made up of red clover, alsike clover, white clover, crimson clover, Japan clover, the sweet clovers, alfalfa, the soy bean, garden bean, cow pea, garden pea, vetches, the peanut, and even some trees well known to you, such as the red bud, black and honey locust, the yellow-wood, and the Kentucky coffee tree.

The stems of these plants are not jointed; the flowers are often brightly colored and large; the leaves are divided into smaller divisions known as leaflets, three in the case of clovers and beans, many in the black locust. They are all but dependent on insects for carrying their pollen, and to encourage these creatures, nature has supplied many of the flowers with a honey-like secretion, the nectar, and apparently to make doubly sure that insects did not overlook this bait, has supplied most of them with a very pleasant fragrance. You will understand better what I mean when you recall the activity of the honey bee about the blossoms of black-locust, of white clover, alfalfa, and sweet clover. Even the soy

bean and cow pea furnish industrious insects much forage at times.

For hay and for grazing, the clovers have a value everywhere. As feed they rank higher than the grasses, though too concentrated for steady feeding alone. Mixed with grasses they furnish as good a ration as can be provided.

The seeds of many members of the group, such as the peas and beans, furnish a very nutritious food for man, the soy bean, for example, providing to the Japanese a variety of dishes, and furnishing beside much of the fodder used for stock in Japan.

But while we should find it difficult to do without this source of food and feed, we could let it go rather than lose the grasses, were it not for a very remarkable peculiarity of the clovers and beans.

Most of them, and probably all, can get nitrogen from the air, and as the true grasses cannot, the latter are dependent on plants of the clover family and on man for this absolutely necessary plant food. The story of how clovers get nitrogen and leave it in the soil for other plants is one of the most curious known to science and to agriculture.

If one of these plants is taken up carefully, so as not to lose many of the fibrous roots, little round, or oval, knots, commonly styled nodules, will be found attached to the roots, and sometimes to the bases of the plants themselves. Under the microscope these knots are found to contain numerous minute germs or bacteria, and these are known to be the cause of the knots, and also the means by which the nitrogen is picked up from air in the soil.

Now nitrogen is a very costly fertilizing material, and yet the farmer has it in his power to get it simply by growing a clover or bean crop. The value of these plants in enriching soil was long known before the explanation of it was furnished. Since the secret was learned it has been found possible to inoculate soils in which the nodules do not occur and thus enable plants of the clover family to do their office there as nitrogen gatherers. Unless the bacteria are present, clovers ex-

haust the nitrogen already in soils exactly as do the grasses and other plants.

In this brief explanation you have the important part taken by the clovers in the rotation of crops. By systematic rotation, including some clover crop, practiced steadily all the time, land can be kept from wearing out, and good crops be harvested every year. In some European countries where farms have been tilled for centuries, better average yields of wheat and oats are now harvested than we get. When we obtain an average of 16 bushels or less, they get an average of 25 to 30. But it would be difficult to plan a rotation worth adopting that did not include both a grass and a clover, the grass to supply vegetable matter, and put the soil in a good physical condition, the clover to supply the most costly, the most quickly removed, the most fugitive, of the necessary fertilizing materials.

We have not yet learned everywhere in Kentucky the supreme importance of forage plants in rotation. Even if we wish to grow tobacco all the time, we cannot afford to do it because of its destructive effect on our land. We cannot grow tobacco without vegetable matter in the soil. In the Burley growing section of the State, we grow the crop now by plowing up pasture, and following it with two tobacco crops. But by a properly managed rotation, a farmer may, if he likes, grow a crop of tobacco on his place every year without pasture of any sort. We have now on the Experiment Farm a series of plots on which we are, in co-operation with the United States Department of Agriculture, practicing different systems of rotation. On one we grow corn every year, adding nothing to the soil. On another we grow corn every year, but fertilize with manure. On others we grow grass and clover, wheat, tobacco; in others, oats, soy beans and tobacco, in many of them depending entirely on the rotations to keep the soil in good condition. These plots have been kept in these different rotations for a good many years, and if there was a decline in fertility it would now be apparent. As a matter of fact, the soil is in good condition, and excellent crops of all sorts are obtained from the land,

But one of the most interesting features of the work thus far is the result with tobacco. For several years past the Burley tobacco from these plots has averaged better than that grown on the Experiment Farm in the usual way, i. e., after pasture, and what is more to the point, the tobacco when placed side by side with the other in the market, sells for a better average price to people who are good judges of tobacco, but know nothing of the history of the crops. The whole secret of this success with tobacco is systematic rotation, alternating it with grass and clover, or with some other member of the clover family. Forage is thus not only valuable in itself, but is essential to the economical and profitable growing of other crops.

Again, when a farmer finds he cannot get help to work all his land, a pasture or meadow is a very convenient way to dispose of part of his holdings. By keeping it in pasture, he can get something from it every year, and yet save himself the necessity of plowing and cultivating frequently. Grazing such land keeps it in excellent condition, too, so that when times change, and a crop is to be grown, he has lost nothing, and finds his land ready to yield better crops than it did when put down in grass. This has been the resource of farmers in countries where help is scarce. It is also an excellent way to save the land and keep winter rains from leaching and washing away the fertilizing materials land contains.

We are thus dependent on the forage plants in more ways than one. They provide the best part of our crops; they feed both man and the domestic animals; they are the chief source of our wealth. They maintain the fertility of our soils.

Having reminded you of their importance and referred very briefly to the reasons why they are important, I may be allowed to go a little farther into the subject and bring it more closely home to you.

PERMANENT PASTURES.

In the best stock raising regions of the world the forage employed is of two general sorts—permanent pasturage and annual forage crops. The permanent

pastures are made up chiefly of grasses and clovers; the annual forage comes from a great variety of plants of many families, but still chiefly from members of the grass family, such as corn and sorghum, with some root crops, pumpkins, rape, etc., some of these sources furnishing variety rather than the essentials. In Kentucky we have one grass that has, perhaps, been depended upon too much for pasturage. Blue grass is an excellent plant for the purpose on good lands, not too wet and not too dry, but on gravelly, clayey and rather poor soils, it does not furnish the grazing needed. It should not be supposed that where blue grass fails us, we are entirely deprived of grazing. Perhaps the soil lacks something blue grass needs, and we can, it may be, provide it. If it is nitrogen, or vegetable matter to render the soil less hard and compact, we have the clovers to help us.

You have probably observed that when the surface of a soil is removed, and the clayey sub-soil is exposed, many plants, among them blue grass; will not grow on it at all. In some regions very few plants of any sort appear on such exposed areas the first year, and these are of slight growth. The second year a fair growth may appear of a miscellaneous assortment of plants, among them some white clover, and in a few years the whole surface may be pretty thickly occupied with clover. What is the explanation of this? Why do the clovers precede the grasses on such soils?

It results from the fact that the deeper layers of soil even when containing most of the necessary plant food, do not contain nitrogen in sufficient quantity, and are too solid to be easily penetrated by the roots of plants. When exposed to the air and frosts their plant food is dissolved, and plants like clover which provide their own nitrogen are soon able to take possession. After them come the grasses and other plants.

This natural process illustrates and points out the procedure necessary for the farmer who wishes to get a permanent meadow or pasture on rather unpromising soils. If he can once get a good growth of some of the clovers—white clover, red clover, cowpeas, soy beans,

Japan clover, or even sweet clover—he has laid the foundation upon which a pasture can be built.

In all our blue grass pastures white clover is to be found. It is the natural associate of blue grass, and sometimes is the more abundant, while, again, during unfavorable weather, it may almost disappear. No doubt, its presence besides furnishing some variety of fare to stock has a more important role in providing nitrogen and thus contributing to the permanence of blue grass. And because of this capacity of the clovers, it is always well to have some of them growing on land occupied by pastures.

The question is sometimes asked: Have we any other grasses besides blue grass suitable for permanent pasture? Yes, we have. On some soils, timothy will do for a time, though not permanent in many soils. Red-top does very well on damp land, and this grass mixed with alsike clover makes a combination for low ground somewhat like that of blue grass and white clover in drier situations. Still another mixture, timothy and alsike clover, will often furnish good grazing on damp land.

One of our very best grasses for permanent pasture is orchard grass. It is one of the most persistent and productive grasses grown in the State. It is true that stock brought up on blue grass does not like it very well, and fine tufts will be left untouched in blue grass pastures. This is a matter of education, however, since it is in some sections of Kentucky depended on for beef cattle. Analysis shows it to compare very favorably as feed with timothy. One planting of orchard grass outlasts a half dozen plantings of timothy, and herein lies the value of orchard grass in comparison. It is a perennial grass. It occupies ground closely. It is productive and hardy, and provides either hay or grazing. In our rotations already referred to, we have in some cases used orchard grass in preference to timothy, my reason for adopting it being the greater certainty of getting a stand quickly. Though this grass requires a good soil, and will not endure soils constantly saturated with water, it is, nevertheless, adapted to a variety of situations and conditions. Our most severe winters do

not hurt it. Drought does not injure it as badly as it does blue grass. It has a peculiar value for growing in shade, where it thrives better, perhaps, than any grass we have. In England it is very commonly sown in orchards because of this peculiarity, and the fact has given it its name, orchard grass.

In the absence of blue grass in some sections of eastern and western Kentucky, farmers there must for the present be content with orchard grass, and other species. Red-top is frequently grown in the west with success. It seems to do better there than at Lexington, because of the fact that the sub-soil is of such character that it holds water better than ours, and red-top thrives with its roots pretty well soaked with water. We have grown the grass in the plots with only moderate success. With a wet season it does very well; at other times, it is not very productive, and runs out in the course of three or four years, like timothy. The hay is good, being moderately fine, and nutritious. In wet places along ditches the grass is often seen growing spontaneously. Its position as a permanent part of our agricultural assets seems to me somewhat uncertain unless it can be greatly improved. It persists chiefly because of lack of something better. One serious objection to it, constantly brought to our attention in the examination of seeds, is the general presence of ergot among the seeds. Certain diseases of stock are attributed to this fungus in hay, and it would not be surprising if we should learn some time that red-top is responsible for some of the little-understood troubles to which stock is subject.

Timothy is a valuable grass for Kentucky, but has always seemed to me not well adapted to our soil, and at any rate much of our hay comes from outside of the State. With a good season, fine growths may be seen in Blue Grass Kentucky, and as good ones in the western part of the State, where, in fact, the soil seems better adapted to the plant. Timothy wants a good deal of water, and a good soil that holds water tenaciously is likely to show a better growth than one from which the water is likely at times to be exhausted. The plant is not sufficiently long-lived here.

Once established, it should last three full years, giving one crop of hay each year, and ought some time to be made to do so by selection.

Much has been said of Canada blue grass, and because of the use of its seeds for adulterating the seeds of Kentucky blue grass, it has a bad reputation in Kentucky. Yet it has its good qualities, one of which is a capacity to take possession of rather poor soils, and hold its own there. It is not very productive, and, when old, is rather wiry, but I think in parts of the State not adapted to ordinary blue grass, it might sometimes be grown with profit.

It is a good binder, because of its manner of spreading by underground shoots, and on embankments and hillsides liable to wash will be found helpful. It grows spontaneously everywhere in Kentucky.

We have a number of other members of the genus *Poa* in Kentucky, but not one of them presents characters that render it a promising subject for improvement with a view to cultivation. Several introduced *Poas* have been tested in our plots, but thus far we have not found one that holds its own, when left to itself, against blue grass and weeds.

We have tested English blue grass, smooth brome-grass, English foxtail, perennial and Italian rye, and the rest, but none of them, excepting the English Blue Grass, known in the books as *Festuca elatior*, seems very promising for our soils.

The rye-grasses are highly valued in England, as is also meadow fox-tail (*Alopecurus pratensis*). They have proved to be neither very productive nor very persistent on the Experiment Farm, and soon give way before blue grass and weeds. They have been tried several times, with the same result, and I think they want a moister atmosphere, and more equable climate than ours.

The tall fescue, English blue grass, already mentioned, covers the ground like orchard grass, and yields about as well, the forage being better liked by stock. I consider this grass, though somewhat coarse, one of the promising ones for the State. The ordinary English blue grass, known in botanies as *Festuca pratensis*,

is a slighter plant of similar appearance, but soon runs out. At the end of three years it has generally been largely gone from the plots. It is, in the books, regarded as a variety of the coarser and more persistent grass, but if the seed we have sown is true to name, and it has been obtained from one of the foremost dealers and importers in the country, the two grasses should certainly rank as distinct species.

Smooth brome grass is very persistent on the Farm, but is uneven in growth and not very productive. It does better in the northwest.

There are two perennial grasses besides those mentioned that ought to be considered for Kentucky. One is a slight fine-bladed, very early grass, known as sheep's fescue. It is one of the most persistent of the grasses I have tested, and this, notwithstanding the fact that its dropped seeds appear never to germinate, and it does not spread by underground shoots. It is a true perennial, and I think may have a value for hilly land of Kentucky for sheep. It is grown for this purpose in Europe. It is a palatable grass. The yield is slight, and it would not do at all for hay.

The second species is tall oats grass, also a true perennial, having persisted in the plots with no apparent diminution in vigor and productiveness for eight years. It is not as coarse if cut at the right time as either timothy or orchard grass. But I am compelled to add that it is not relished by stock—is, in fact, another example of the special vigor with lack of palatability. So it is not, perhaps, to be considered for blue-grass Kentucky. I have kept my eye on it for a good many years in the plots as a possibility for some sections which cannot grow other forage. In appearance, productiveness, and hardiness, it is an almost ideal meadow and pasture plant. Now, why cannot that combination of characters go with palatability?

A number of southern grasses have been tried from time to time by us in the hope that among them was something that would take the place of blue grass in western Kentucky. Bermuda grass was established, after repeated attempts with seed, by using cuttings, and we now have a couple of small plots that were

started several years ago. The grass makes a dense fine growth for lawn, of velvety softness, but becomes brown with the first frosts and remains so until rather late spring. This defect will lead to its rejection wherever blue grass can be grown, but in southwestern Kentucky it is more at home, and some fairly satisfactory growths of it are to be seen in the yards about the Illinois Central Railroad buildings at Fulton, Kentucky. The grass is not productive enough in Kentucky to satisfy our farmers. In the plots and elsewhere in the State, the growth is only from about eleven to fourteen inches high when the plants are in bloom. It is a valuable grass farther south, but will probably never be generally grown in this State. Johnson grass is another southern species grown by me. It is a coarse, tall plant, furnishing fodder relished by stock, but because of its disposition to persist in soils when once established, our farmers are afraid of it. It does not in our soils make the close growth necessary to productiveness. In Kentucky it is regarded as a weed. Farmers sometimes write us asking how it may be got rid of. The best way known to me is close cultivation and winter plowing to throw up the root-stocks by which it spreads so as to expose them to frost, or else, close grazing.

We have been accustomed to place the common red clover at the head of its group, and it has been entitled to that distinction. But at times it has not done well in some parts of Kentucky, and farmers in these sections despair of ever again raising this clover as successfully as it was raised years ago. There is some ground for this discouragement, but I think the difficulty will, like others that have appeared from time to time, be eventually overcome, or run its course, when clover will again thrive on land now clover sick. Undoubtedly some of the difficulty is due to the small beetle described in one of our bulletins. Some of it is the work of bacteria or fungi. Some failures are due to poor seeds. It is certainly not due to lack of nodule bacteria in the soil. There is no difficulty in getting an abundance of nodules on the roots, in fact in some of our experimental work we have found it difficult to keep the nodule bacteria away from them. They are so numerous and so generally

present that it is actually a matter of annoying difficulty to keep soil or other media on which experimental clover is grown, free from the organisms.

Alsike clover has been advocated lately for planting in place of red clover; it grows very well in Kentucky, especially in wet places, but is not as productive as red clover. It lasts only two or three years.

Crimson clover I consider a valuable plant for fall sowing. It matures early in the spring, is as productive as red clover, and has the same effect on the soil. It seems to languish during hot summer weather when sown in the spring, and I would not advise sowing it then. A plot grown on the farm several years ago yielded, June 7, hay at the rate of 2.8 tons per acre.

We have grown most of the other clovers that have been brought to this country—Hungarian, Egyptian, sweet, trefoil and the rest. They have generally failed in one quality or another. One is too coarse; another is not sufficiently productive; stock does not like a third. Trefoil for sheep may prove of value in our mountains. It is a slight plant with a yellow blossom, growing about as high as white clover. The seeds are sometimes imported to be used as an adulterant in red clover seeds. In this way, and by their accidental presence with other seeds, the plant has become widely scattered in the State, and is to be encountered in small quantity almost anywhere in pastures and along roads.

White sweet clover, or Bokhara clover, is the tall plant with white blossoms to be seen growing on neglected land at the edges of cities. It is a good bee plant, and produces a forage resembling alfalfa closely, in general appearance, when young. It is sometimes mistaken for alfalfa, but may be quickly recognized at any stage of growth, by crushing the leaves, when the sweetish odor from which it takes its name is given off. Our animals do not like it. Farther south it is said it is eaten by cattle readily enough.

It is chiefly interesting because of its close resemblance to alfalfa, and the fact that the nodule bacteria on its roots seem to be identical with those causing nodules on alfalfa.

If any one wants to grow this plant he will have no difficulty in doing it. It thrives in very unpromising soils, sometimes on clays that will produce little else. It grows to a height of five or six feet, and produces a good quantity of forage. If one wishes to bring up a clayey soil, and cannot get a more palatable species, he may under some circumstances find it profitable to sow this plant for the humus and nitrogen it will produce.

Sweet clover naturally suggests alfalfa, one of the most valuable of all forage plants, both for the hay it produces, and for its good effect on the soil. If we could grow it everywhere in Kentucky, we could afford to let red clover go. Once established, it is as nearly perennial as any of the clovers. The yield is sometimes far in excess of anything ever secured from red clover, and the quality of the hay is as good, some think even better. I have kept small plots of this plant on the farm for six years, and at times secured hay from them at the rate of from six to ten tons per acre. Three cuttings, and sometimes four, may be taken from the plant when in good condition. But after several years of extraordinary success with it in 1907, it all but failed in the plots, and proved very unsatisfactory in the hands of other people. A farmer from Nelson county who has for years depended on the plant for fattening beef cattle told me in the fall of the year that he had never before had such unsatisfactory experience with it. It appeared to be a result of the wet season partly, and was partly due to attacks of a small leaf hopper (*Empoasca mali*).

But if we can grow alfalfa for periods of six or seven years at a time, this is an improvement on red clover, and we can afford to plow it up and start again, and I sincerely hope Kentucky farmers will not give up trying alfalfa because of its failure during very wet springs. It is well worth struggling for.

There are a few annual leguminous plants that must be considered in any account, however imperfect, of Kentucky forage.

The Russian or sand vetch (*Vicia villosa*) is a trailing plant that does well in Kentucky, often persisting on land spontaneously, from dropped seeds. It is, from its

manner of growth, rather unmanageable for forage, but can be handled by growing it with some grass or grain. It is to be looked upon as a soil improver chiefly, and as a cover crop for orchards and hillsides.

Japan clover (*Lespedeza striata*) is a rather small plant with very fine leafage, which has for a number of years past gradually extended its range in Kentucky, taking care of itself on the most inhospitable of soils along roadsides and in abandoned fields, where it furnishes such abundant and nutritious grazing as to have worked a genuine transformation in the appearance of roaming stock in some sections of the State. The plant is an annual nitrogen gatherer, so that while it is helping the stock of the poor it is also improving some of our poor clayey soils. It is a little tender, and on this account may always be more or less completely restricted to the southern three-fourths of the State. The seeds are hard to collect because of the fact that they are rather few in number, and are scattered along the stems. Bought seeds have not always germinated with me. One can well afford to make an effort to get Japan clover started in his neighborhood. Like white clover and sweet clover, it is adapted to soils that other forage plants do not thrive in, and will in time put them in a condition to grow other things.

THE ESTABLISHMENT OF PERMANENT PASTURES.

In making a choice of these different plants for pasture much must be left to the judgment of the farmer. If his land is inclined to be wet he will use one of several plants adapted to wet lands. If it is high and dry certain others must be employed. The old saying, "The higher the hill the lower the grass," is true largely because the hilltops have had the good soil washed down into the valleys. If hills can be kept clothed, especially in winter, with a cover crop such as rye, vetch, or some grass, they will produce as good grass as grows anywhere. But certain species such as sheep's fescue and trefoil thrive on hills better than red top and blue grass, and should be employed for these situations. Low ground, again, must have the species adapted to a damp

situation, as already noted. Yet it must be found that most low ground produces a better pasture or meadow if it is properly drained. Cattle will not fatten well when kept on a cold wet soil in fall and spring. Too much of their food is expended in keeping their bodies warm. They show the bad effect of a cold wet pasture also in the smaller quantity of milk produced.

This whole subject of caring for pasture land is greatly neglected in this country. Our practice implies that we believe grass will start and do well in any soil without the preparation of any sort of seed bed. It is a mistake. Even when we get a stand the product is not what it should be if the land has been impoverished by other crops and otherwise misused.

The land cannot be prepared too well previous to the sowing of either grass or clover seed. This preparation may be brought about in the course of cultivating some other crop, but it is not best in many cases to trust to this alone. Alfalfa especially requires a good deeply plowed, well pulverized soil. And after it has been so prepared it must be "firmed" by the use of a heavy roller. You have, perhaps, observed such plants taking hold and making a fine growth on old road beds, while in the middle of the field, where the soil has been best prepared, the growth is scant. The young plants suffer from being started in soil that is not continuous with the sub-soil beneath. They may be lifted free by frost if planted in fall, or dried out if planted in spring. The seed bed must be made compact in order to get best results with sowings made for pasture and meadow.

With reference to spring as against fall sowing of grass and clover seeds, I have to say that while in my own experience with experimental plantings of many different forage plants, my best results have come from spring planting, yet fall planting will give good results. In the case of alfalfa, it has been supposed that the young plants escape crowding with annual weeds when it is sown in the fall, the frost soon destroying the weeds. It is desirable to get the young plants well started before the weeds get ahead of them, but this can be done by sowing very early in spring. Some of the best growths of alfalfa we have had on the Experiment Farm were sown

about the 28th of March. Some plantings made at the same season in the fall have never done so well. Still it may be a matter of experience with us. We have done most of our planting of grasses and clovers in spring, and perhaps know better how to start them at that time.

ANNUAL FORAGE.

While permanent meadows and pastures are of very great importance, they must be supplemented in most countries by forage of other sorts. A very large amount of this additional forage comes, as has already been stated, from the grains, while annual grasses, clovers, and many other plants help out when pastures and meadows for any reason fail us. In the southwest an indifferent feed is obtained, as you know, from various species of cactus, some spiny, others not. In Kentucky we have some supplementary forage plants of far greater value.

You doubtless know the old story of the Englishman talking with a Scotchman and remarking, "In England we feed oats to horses, but in Scotland you eat oats yourselves," and to which the Scot replied, "That's why we have such fine men in Scotland and you have such fine horses in England." In America we feed both ourselves and our horses on oats, which, I suppose, explains why we have both fine men and fine horses.

Oats is a valuable food, and one of the best of feeds also for stock. The plant does not show the vigor here that it does in some other States, and unless we can, by selection, find varieties better adapted to our conditions, we shall never be able to compete with the oats-growing States of the Northwest. This is a problem to be worked out by some one. The crop is of the very highest value for horses, and the person who will discover, or produce, a variety that will here average large yields of seed of good nutritive value, will greatly benefit the stock raising interests of Kentucky. I am referring to spring oats, because it is my belief that the chances are better to improve and completely adapt a spring variety to our conditions than it would be to produce a winter oats that will invariably withstand our low winter temperatures. Even as far south as Alabama winter oats is sometimes killed by severe cold. The crop is more likely to suffer

from this cause in Kentucky, though some varieties have done well during favorable winters on our Experiment Farm.

Some as valuable work can be done for us by careful screening of home-grown oats seed so as to discard the imperfect and save only the heavy, as is being done with tobacco. The process is one of selection, and if it were everywhere practiced, coupled with intelligent selection by other procedures, would undoubtedly soon show an increased average yield for the State. Oats is one of the forage plants that should be greatly improved for Kentucky, and be more generally grown in the State.

Rye is another of the cereal group of small grains that has value both as food and as feed. It is very well understood in Kentucky, and is quite generally employed both for stock and as a green manure. It has an established place, I believe, in any system of scientific farming that may finally be adopted for the State.

Barley does well in Kentucky, and was years ago grown quite extensively for malt. I know of no reason why it should not be grown now, if there was a demand for it. It has value for stock, but seems not to have found a place with us not already occupied by as good or better forage.

Corn is the king of forage plants in Kentucky. There is no doubt about this. It is grown in every county in the State. Every part of the plant from the ground up can be utilized for one or another purpose. It is the one really great addition made by America to the cereal group of plants. Both stalk and grain considered, Kentucky is within the region in which the plant attains its best development as a crop. Somewhat farther north the growth is dwarfed by low average temperature and short season. In some of the Gulf States the growth of stalk is excessive, and the grain not of as good quality as it is here and farther north. Kentucky farmers have always recognized the value of this crop and need no coaching in this direction. But there is room for great improvement in strains, by selection based upon a study of the characters that go to make a good yield of high grade grain. An inspection of the corn exhibited at our county and State fairs has shown that the corn consid-

ered best by many exhibitors produced a very long ear with large cob and short, wide seed. The first State Fair at Louisville was notable for the numbers of these long ears shown, some of them measuring fully 17 inches. The length has diminished gradually with each succeeding fair, while the cob has grown smaller and the grain deeper. Much of this change for the better is due to the good work done in farmers' institutes. The reading of Station bulletins has also doubtless helped, and the opportunity to observe and compare really good corn with their own product at the fairs has contributed its share in spreading among our growers right ideas on the subject, and with them improved varieties of corn. Some of the corn shown at our recent fairs would have compared favorably with that shown in the States where this matter of selection has been most carefully and systematically followed. This year we stood third on white dent corn in the National Corn Show at Columbus, Ohio, beating such States as Ohio and Illinois.

There is yet much to do in Kentucky on our corns. Some of the very best varieties in the State are not completely suited to our conditions. Some young fellow with a good farm at his command can make himself a name and help forward the agriculture of his State by devoting his life to this one object of producing a corn for Kentucky of decidedly better quality than any we now have. The enterprise is well worthy of any farmer, and is, I believe, sure to be profitable to the one who undertakes it.

In looking to the improvement of corn it will be necessary not only to select the best ears, as is now the fashion, but also good, well-proportioned, vigorous, productive plants, that will hold their own against unfavorable weather and produce no sterile stalks and no nubbins.

Sorghum is another valuable forage plant, furnishing both food for man and feed for stock. I think its value, for cattle especially, is not as fully appreciated in Kentucky as it ought to be. It has a special value for silage, and yields more such fodder than corn. It should have a place on every dairy farm, at any rate.

I have been very favorably impressed with some of the so-called non-saccharine sorghums, such as yellow millo maize and white millo maize. They produce a greater growth of blade than sorghum, resembling corn in this respect, and possess some of the productiveness of common sorghum. They seem to me, from their habit, well suited to produce large quantities of green fodder and of silage. They have yielded in small plots from 25 to 28 tons of green fodder per acre, making about 14 tons of dry forage. All these sorghums seem to have the advantage of corn in standing drought better, but the fodder is a little harsher.

The sorghums should be recognized as an established feature of our agriculture. We have occasional dry seasons that cut down the corn crop so as to leave the farmer, with stock on his hands, in a precarious condition. He can generally count on the sorghums to come through such dry weather in pretty good condition, and it is always wise on stock farms to have a reserve of sorghum kept as a precaution against failure of the corn crop. The variety in diet it will afford is of itself a desideratum even when the corn crop is abundant.

In non-saccharine sorghums we have giant grasses that furnish no food to man, and since I have opened up this branch of my subject, I may as well consider briefly a few others of importance, pausing now only to call attention to root crops which furnish us food, and are calculated to provide palatable fare for domestic animals. Beets, mangels, turnips, carrots, are a very convenient form in which to preserve fresh vegetable food for stock in the winter. They keep well in either cellar, or buried out of doors, and for the best health of dairy cattle ought to be provided.

Of the millets, we have tested nothing more promising than German millet, which I think has come to stay, though not as much grown now as it will be later. In America it is used only for stock, but it has been grown for food for centuries—seems even to have been one of the grasses gathered by pre-historic man, and is still used for food in eastern countries.

Japan millet shows no qualities to commend it especially. It is closely related to our common barn-yard grass, and has been considered only a variety.

Pearl millet, sometimes called Mand's Wonder Forage Plant, and *Pencilaria* (*Pennisetum typhoideum*) would seem a very wonderful plant indeed if we did not have corn and sorghum. It is not as coarse as corn, and has a head somewhat like that of timothy, but reaching a length of twelve inches. It is an annual, but when cut in our plots made a good second growth.

A small plot from which two cuttings were secured in 1901 yielded dry fodder at the rate of 16.4 tons per acre. The first cutting was made June 17, and the second, September 26. The plant comes from the East, where it is grown extensively for its seeds.

We have had but one other plant in the plots that produced such large quantities of fodder. This is the Mexican forage plant, Teosinte (*Euchlaena luxurians*). It is the nearest relative of corn occurring in America, and is much like it in the character of forage produced. In 1901 we took in a single cutting at the rate of 15.5 tons of dry fodder per acre. The plant produces no seeds here, which puts it at a disadvantage in competing for favor. It is certainly a wonderful plant for green forage, and is easily grown here.

The Canada field pea is much like trailing varieties of the garden pea, and is, I think, no better for forage. It, also, requires some support, and should be grown with oats, or a grass, if it is desired to cut it. It mildews in Kentucky; I think we are too far south for it.

The velvet bean from the far south makes a very surprising growth of vine, but requires a longer season than ours. I have secured well developed pods from it during a long mild fall, but ordinarily it is cut down by frosts before it has bloomed. From what I have seen of it here, I judge it to be a very valuable plant for the Gulf States.

The cowpeas have proved the most easily managed of the trailing beans, and the iron, new era, and gray goose have done best in the plots, producing from 2.5 to 5.4 tons of hay per acre and from 20 to 40 bushels of seed.

After growing these plants for a good many years side by side with soy beans, my preference is for the latter as a forage plant and soil improver. It has a more erect growth and is thus more easily cultivated and

cut, yields more forage and as many seeds. We have at times cut hay from plots at the rate of five or six tons per acre, and the seeds range from about 20 to 40 bushels per acre. When we have learned to handle the seed crop properly, I have no doubt soy beans will grow in favor.

One other forage of this group I consider of much greater importance for Kentucky than is now recognized by farmers, judging by the slight extent to which it is grown. Everywhere north, after corn is cut, one sees scattered over the fields, numbers of yellow pumpkins, which make excellent food for milk cows. I have often wondered why we did not more generally grow such things for the same purpose here. Like the root crops, they are easily kept during the winter, and I believe both should have a place at least on our dairy farms.

When Kentucky has developed the dairy interests of which she is capable, and I think she is moving in this direction now, these crops will probably be recognized here at their real value.

Root crops, such as beets, mangels, carrots and the like have a value as winter feed that should not be overlooked by our people who are interested in dairying and hogs. Europeans have long recognized their value and make much use of them and of such crops as rape. The latter under the name of Dwarf Essex Rape has been grown successfully in this country. It is cabbage so far as its feeding value is concerned, having about the same composition, and thriving in the same sort of soils.

GRASS MIXTURES.

It has always been a favorite idea with writers on agricultural topics to establish on land permanent pastures or permanent meadows, consisting of forage plants that supplement each other in one way and another, and thus keep stock in better condition than will a single plant species. The idea probably originated in England and Ireland, where, from the moisture in the air and soil, and a rather even climate, it seems possible to realize something of the results which we would naturally expect to get from well chosen mixtures. In Kentucky, at any rate, and I think it is true also of others of the States, though perhaps not of all, mixtures recommended by seedmen do not always prove superior to

single grasses or legumes, and considering the high prices charged for special mixtures, it is questionable if our farmers gain anything by sowing most of them. Certainly they are in a position to make cheaper and as good mixtures, just as they can make a fertilizer mixture better adapted to land, once they know what the soil already contains.

Theoretically, mixtures should be much superior to single species. A variety of herbage no doubt helps the digestion of stock. Monotony of fare sometimes prevents the best possible results in feeding, even when the fare consists of the best single ingredient it is possible to provide. At least two plants, a grass and a legume, are very desirable; but from our own experience, it seems unlikely that we shall soon secure an elaborate mixture adapted to our conditions.

The chief difficulty in growing and maintaining mixtures in Kentucky comes from the aggressive disposition of certain grasses when grown in our soil, and their tendency to overshadow and finally suppress those of less persistent and vigorous habit. From experience with plots, I should expect any mixture containing a large per cent. of orchard grass seeds to result finally in a continuous, unmixed growth of orchard grass. Sown with it, perennial rye grass, meadow foxtail (*Alopecurus pratensis*), English blue grass, smooth brome grass, timothy, and the clovers have little chance of continuing long, and I have seen seed mixtures produce in a few years as fine a growth of orchard grass as we could hope to get by sowing the pure orchard grass seeds. We have found only a few grasses that hold their own with orchard grass for any length of time. Tall oats grass lasts as long as any of them. Blue grass itself is disposed to give way before it, if the orchard grass is sown with it in any quantity and gets a fair start.

But blue grass will crowd out and displace many of the introduced grasses, just as orchard grass does. Meadow foxtail, perennial rye grass, timothy, Canada blue grass, red-top, all give ground as it advances, and mixtures containing blue grass, but not orchard grass, and tall oats grass, are very likely in time to result in a continuous growth of Kentucky blue grass.

Because of this disposition of some valuable forage plants to give way and of others to overshadow, it is practically very difficult, if not impossible, to maintain here permanent growths consisting of a great variety of species; and in view of this difficulty it seems at present better practice to grow singly some one of the grasses, or clovers, of proved value for the soil and climate, rather than attempt any very elaborate mixture.

SEEDMEN'S MIXTURES.

Some seedmen's mixtures may be regarded with suspicion because of the well-known temptation to mix left-over stock and sell it for what it will bring. If a part of the seeds fail to germinate because of old age, some of the rest will germinate, and the buyer never knows the difference. Others are no doubt offered in good faith, though probably not in all cases after making practical tests. It is possible that some of the earlier American writers, such as Flint, accepted mixtures that are practicable in England, without testing them here. Flint's mixture recommended for permanent pastures is as follows:

Meadow foxtail (<i>Alopecurus pratensis</i>).....	2 lbs.
Orchard grass	6 lbs.
Sweet-scented Vernal grass	1 lb.
Meadow fescue (<i>Festuca pratensis?</i>).....	2 lbs.
Red-top	2 lbs.
Kentucky blue-grass	4 lbs.
Italian rye grass	4 lbs.
Perennial rye grass	6 lbs.
Timothy	3 lbs.
Rough-stalked meadow grass	2 lbs.
Perennial clover (Red).....	3 lbs.
White clover	5 lbs.
<hr/>	
Total	40 lbs.

The mixture looks very much as if it had originated in England, and I believe, would, if sown in blue grass soil, using our experience as a basis for judgment, result, at the end of three years, in an almost unmixed growth of orchard grass.

His second mixture for permanent pasture contains forty-five pounds of seeds, with the two rye grasses, Italian and Perennial, holding chief place. This mixture is, he says, recommended by a seed firm of Edinburg, as might have been guessed from the important place given

the rye grasses. It seems likely that Flint's first mixture was not a little influenced by this one, since it contains no single species not included by the Scotch seedsmen.

If we are ever to have mixtures adapted to our conditions, it will be necessary to go back to first principles, learning among other things just what species, adapted to our soil and climate, will live in harmony together. Conditions in England, Scotland and Ireland are, it seems, no safe guide for us in this matter.

In 1905, the writer secured from J. M. Thorburn and Company, of New York City, several mixtures advertised in the firm's catalogue, and had them sown in plots on the Experiment Farm for observation. Among the mixtures secured were the following:

"*Meadow Mixture*" No. 1. "On good land, neither too dry nor too wet. Sow 2 bushels (20 lbs.) to the acre." This mixture was given in the catalogue as follows: Red-top, 5 lbs.; meadow foxtail, 1 lb.; perennial sweet vernal, $\frac{1}{2}$ lb.; tall meadow oat grass, 2 lbs.; orchard grass, 3 lbs.; hard fescue, 2 lbs.; sheep's fescue, 2 lbs.; perennial rye grass, 5 lbs.; timothy, 17 lbs.; red clover, 2 lbs.; alsike clover, $\frac{1}{2}$ lb.—40 lbs.

Price \$2.00 per bushel.

On April 17, 1905, two plots were sown with this mixture. The stand was good, and in midsummer, clover constituted about one-fourth; timothy, one-fourth, alsike clover, one-eighth; tall oats grass, one-sixteenth, and orchard grass and a few others, not recognizable at the time, the remaining five-sixteenths. The red clover and timothy appeared again in 1906, but the clover showed signs of failing toward the end of the summer, while orchard grass became conspicuous.

In 1907 the whole plot consisted of orchard grass, except a few scattered tufts of tall oats grass. It will be noticed that 17 pounds of this mixture consisted of timothy, and we should have expected this grass to dominate the growth for a time at least. It did not do so. The orchard grass seed, of which there were only three pounds, finally suppressed everything else except tall oats grass. It would be unsafe to say that this was due entirely to the aggressive character of the orchard grass. The timothy seed may not have been of first-rate quality.

“Thorburn’s Grass Mixture for Railroad Banks, etc.,” was described as “A mixture of grasses with long, interlacing, matting roots, that will bind steep embankments, gravelly, or sandy slopes, etc., preventing wash-outs by rainstorms and covering with permanently green turf. Price per bushel of 22 pounds, \$4.00.

A grass that will take firm hold of loose soils and cover them completely, so as to prevent washing, is greatly needed by railroad companies and by farmers in some localities. Some of the best grasses have a very limited usefulness in this direction, while others of less value for forage, bind and protect embankments very effectively. What is wanted is a hardy grass of rapid growth and vigorous habit. It should spread by underground shoots, since such grasses are the ones which most completely cover the surface and, favored by moisture in the soil, spread at times when grasses dependent on their seeds for dissemination remain at a standstill. Kentucky blue grass is one of the best known species presenting this manner of spreading. Canada blue grass is another species, scarcely less well, though not so favorably known.

For binding poor gravelly soils, it sometimes proves the better of the two. Tall meadow fescue pushes out in all directions in the same way. The western wheat grass, (*Agropyron spicatum*), is very persistent in pushing out under the ground and constantly makes work in our plots by invading the paths. For the south, Bermuda grass has a value of this sort. Ordinary crab grass (*Syntherisma sanguinalis*), though an annual, is an excellent binder, and becomes a great pest in cultivated ground as a consequence, for it grows in both good and poor soils. Johnson grass (sorghum halapense), is persistent and troublesome because of its underground shoots.

If I were making up a mixture for binding embankments, I should certainly employ some, or all, of these grasses, and if I wanted leguminous plants to go with them, sweet clover, Japan clover, and white clover would be my choice.

Thorburn’s mixture sown in April, 1905, gave a good stand, consisting of red-top largely and crab-grass, the latter probably volunteer, as it is a common weed in

the soil, and its seeds can not be found in a reserved sample of the mixture sown. In 1907 the growth in both plots consisted of red-top largely—about four-fifths—I estimate. With this were a few tufts and plants of velvet grass (*Holcus lanatus*), alsike clover, white clover, orchard grass, timothy and smooth brome grass.

From experience such as this, and from observations made for a good many years on the operations of farmers, I have been driven to the conclusion that we can make better mixtures than we can buy, and that the ones calculated to give us most in value for our money and time are very simple mixtures of a few species known to thrive under our conditions.

Timothy, tall oats grass, English blue grass, Kentucky blue grass, red-top, red clover, trefoil, alsike clover and white clover, are the species from which a choice must be made in selecting a mixture for most situations in Kentucky. Two or three of the grasses with one or two of the clovers may be expected to give better results than a large variety. Such grasses as perennial rye grass, meadow foxtail, velvet grass and some others recommended for European meadow, appear to suffer from our rather uneven winter weather.

No doubt as time moves along, we shall learn to make use of some grasses and clovers with which we are unfamiliar, and doubtless also we shall get strains of some of those we do know that will give us better results than we are now getting. When we have reached our best development as an agricultural State we shall doubtless also regularly employ many of the supplementary feeds instead of depending entirely on our grasses and grains. But in the immediate future, I believe we shall make greatest progress by giving careful attention to the improvement of our corn, oats, timothy, orchard grass and clovers, the plants we now have and understand best.

I wish to insist that these are the crops of most importance to Kentucky farmers and to the State. They are the crops which will respond soonest to efforts made for their improvement. Their improvement means more money to Kentucky as a whole than improvement in anything else we grow.

ADDRESS OF HONORABLE A. O. STANLEY ON
SUBJECT OF GOOD ROADS.

Delivered at the Meeting of the Kentucky Good Roads
Association

Held at the 1915 Kentucky State Fair.

Ladies and Gentlemen:

I am deeply grateful to my good friend, Bob McBryde, for his very kind reference to me. We should all be deeply grateful to him for his years of tireless, patient and unrequited toil in behalf of this great movement, without expecting, without receiving any other recompense than the gratitude of his countrymen and the welfare of his country. With tongue and pen he has presented with marked ability every reason which can be assigned for this great work, and he has answered every objection which the ignorant or penurious might advance. The people of Kentucky have yet to learn the debt they owe this great journalist for a great work nobly done.

I am not here today to attempt to entertain you with anything that approaches a formal address. I am not here to make a speech; if I am elected Governor of Kentucky, my time will not be given to saying things, but to doing them. This is in its essence a matter of business as well as sentiment, and to the fiscal side of this problem I shall, in the main, address my few remarks.

You cannot build roads, however advisable it may be, without money. To say that you are in favor of good roads is like saying you are in favor of good health, or good morals, good atmosphere or good looks or good anything else. Anybody not a driveling fool favors good roads just as he favors good health or good weather. We all favor good roads, who have sense enough to travel over them. The question is not whether it is desirable to have better highways in Kentucky, but how we shall obtain them. We all want them if we can afford them, because we must buy and pay for these roads ourselves.

We will receive some aid from the Federal Government, but the Federal Government and the State Government alike tax the people for the money, so at last every dollar that is put in good roads must come directly or indirectly out of the pockets of the people who enjoy them. Then the question to which an intelligent citizenship should first address itself is not shall we donate, but should we invest the money toward this good work? If you go out to get money to build good roads on the same principle that you go to get money to educate the Chinese or save the heathen you will not build many miles of road. To get this money, you must, in a way, take it from the people, with their consent, by taxation. But the people are not going to tax themselves to build the roads unless they are convinced that it is a good investment. And whenever the people find that they are making money by expending money upon the roads, you will get the money just as quickly as you would secure it from a farmer you have convinced that he would make money by buying an addition of 1,000 acres to his farm that is for sale nearby. There is no trouble to induce men to spend money when they are certain or reasonably certain of a safe return. Now, is the expenditure of many thousands of dollars for good roads a safe investment?

MONEY AND RESULTS.

I am separating it from its moral and aesthetic, its sentimental side. I am talking to you about the propriety of expending money for roads as I would talk to a farmer about the spending of money for land, as I would talk to the manufacturer of the propriety of spending money for machinery, as I would talk to the mine owner of spending money for a tipple, or an option upon so many acres of coal land.

A great mistake that farmers have made is in not making a businesslike calculation as to the cost of production, which bears a direct relation to the advisability of constructing good roads. A short time ago, Charles L. Schwab, former president of the United States Steel Corporation, and now president of the Bethlehem Steel Company, the most gifted of all the great industrial masters of finance, made this startling statement: "One-third

of the cost of the production of all steel products is the cost of transportation." And one of the secrets of Schwab's phenomenal success was that he never calculated the cost of anything made of steel from a needle to a thousand tons of armor plate, that he did not calculate the cost of laying it down F. O. B., to the consignee. The farmer does not calculate. He calculates the cost of production in a rough way by taking cost of land, taxes, labor and tools; when he has calculated what it cost him to get in fifty bushels of wheat on his wagon, or a thousand bushels of corn in his bin, completes his calculation. But he has not estimated the cost of that article in its entirety, for no man comes to the bin for his corn, or to the thresher for his grain. Until he has calculated the cost of transportation he has not made an accurate estimate of the real cost of production. What is the actual value of the free public highway? Let us see—four good horses and a wagon, for example—the four horses at \$150 apiece, \$600, and the cost of shoeing, harness, is to be considered, the whole will cost not less than \$1,000; adding in the cost of maintaining these four horses, say at \$8 a month, is \$500 a year, and you have that to add to the original cost. In six years your \$1,000 in horses and wagon is gone, as they will be worn out. The maintenance will cost you not less than \$600 a year—\$2 per day. We may say that the same teams will do double the work over a macadam road than they will do over a dirt road. So that the farmer in the item of four-horse team, wagon and driver has saved at least \$1 per day by the use of macadam roads. When the farmers have calculated the saving in the one item of transportation, the taking of their products to market, leaving out the pleasure of traveling over macadam roads to himself and his family, leaving out the advantages to the children in attending school and his family in attending church, leaving out the features of being closer to market or to mill, on the plain basis of dollars and cents, there is no better investment to the producer than in the making of a cheap and convenient means of bringing the farmers' commodities to the market.

But let us take a broader and a higher view. Every man who cast his ballot in the hope of receiving some

pecuniary or personal benefit either in emoluments of office or some pecuniary advantage is a menace. By that I mean that the man who votes simply to keep up some political organization, the man who votes at the call of a boss, the man who votes for money in hand, is a menace to the liberties of a free people. This Government rests upon the disinterested devotion to high ideals of its citizenship; it is the foundation upon which the republic rests because a majority absolutely rules in this country. And whenever that majority ceases to be honest, this Government will topple like a house of cards.

What has preserved this Government for 150 years or more? I will tell you—The plain citizen seated in a cane-bottom chair on a rag carpet, before an open fireplace, with a Bible on his knees, and his family grouped about him, his head bowed, and simply and reverently asking God to guide him through the night, and arising in the fear of that same God at dawn to take up the simple tasks of the day. He votes with no thought of profit to himself, but for the good of his family and the honor of his country, and the glory of his God. This is the power upon which this republic rests and must forever rest. Now we talk about this simple life, its high ideals, and its noble purpose, and yet there is, in Kentucky, a continual exodus from the country to the town. I make no warfare upon the city. I have lived in towns the most of my life, but what I mean to say is that what we need is more good people on the farms in the country. It will cheapen the cost of living in town. It will bring more customers, and new life and new capital to our great cities. It is an invincible instinct for men to seek the society of their fellows, to gather as we have gathered here today in great multitudes. It is as natural as for partridges to gather in covies in the field, or birds in flocks in the sky. It is essential to the happiness, the mental and moral welfare of mankind, just so much as food or clothing. The thing that has destroyed rural life, the thing that has depopulated fertile lands is the loneliness and isolation of life in the country. Our girls and boys who live in rural districts are literally marooned in the winter, without access to the post-office, the church or the school; to the doctor in time of sickness, or the

store for the bare necessities of life in any other way than on a mule, belly deep in the mire. Our boys and girls simply will not be kept in the rural districts ten miles from any town under such conditions, however much you may talk about the noble life of the country. It is too often the most lonesome existence on earth. If you wish to live in the country and bring up your family around you, if you wish them blessed by the things which are good and sweet in the rural life, then you must give them the pleasant things of life in the city. Build good roads to the city, you will lose none of the seclusion and sweetness of the country. The sunshine and dew and the landscape are still there, the fertile fields and the lowing herds, and the scent of new mown hay, and the silent benediction of the evening still are yours. With good roads and an automobile—if you cannot get an automobile borrow a Ford—the wife and her boys and girls can go to church, they can go to the fair, they can go to places of amusement, they have the advantages of the pleasures of the city, and you have not been deprived of your country home or anything that makes it desirable or lovely. You will never solve the question of “back to the country” until you have made the country more attractive. You cannot keep your family in the country with ten or twenty miles of impassable dirt roads between them and the things they want for nine months in the year.

INCREASE IN PROSPERITY.

The country will be happier, more thickly inhabited, if the roads are improved, and the city will find an increase in prosperity whenever you unite the two by macadam roads.

Both political parties have condemned the contract labor system. Both parties favor employing convicts upon the roads. Now the counties have the right to employ whom they please with the money they raise themselves, and it is a vexed question to what extent the State can force convict labor upon the counties, coming as it must, more or less, in competition with free labor. In Edmonson county, especially, we have an unlimited deposit of rock asphalt, the finest road-making material

known, a material that will cover your macadam roads with waterproofing a thousand times more indestructible than oil; a substance hard, yet elastic, that is as enduring as marble. And yet this vast and priceless deposit today is reached only by dirt roads that are almost impassable. This is a disgrace to Kentucky. I would see, and I hope to see, the labor of convicts, as well as others, employed in the development of these great quarries, and I hope to see this, the greatest road-making material ever known, spread over 5,000 miles of boulevard all over Kentucky from mountains to Mills Point.

I could talk to you for a week upon this subject. Oh, it means so much to Kentucky as a State, and there is much to expect from the development of good roads. No other State in this Union has such a variety and wealth of undeveloped resources; more coal than Pennsylvania; more hardwood than any other Commonwealth between the Mississippi and the Pacific, and more acres of fertile soil than any other state of like area between the two oceans. Our soil produces a greater variety of products than any other on this earth. Why is it that the wealth of the mountains and the wealth of the plains are not developed? It is because the people of the mountains cannot reach the wealth of the plains, and the people of the plains cannot avail themselves of the wealth of the mountains, because of the cost of getting from one to the other. This is eliminated by connecting them by great highways. It will increase the fertility of the soil and the richness of the mines and the vast wealth of the forest.

Upon this movement rests the happiness and the prosperity of the greatest people on earth, the people who live and who expect to die in old Kentucky. God bless her.

For many years there has been a growth of sentiment against the prison contractor reaping large profits from the convict whose liberty has been forfeited to the State for his crime, and there has likewise grown up the sentiment that the profit that may come from the labor of the criminal should inure to the benefit of the whole people rather than to the benefit of a few favored contractors, and for that reason the General Assembly

of Kentucky has submitted to the voters of the State a Constitutional amendment, providing that convicts may be employed in the construction of the highways of the State, so that these highways may be constructed for the benefit of the State, at the lowest possible cost, and that whatever profit is to be derived from the labor of convicts may inure to the benefit of the whole people.

PART FOUR

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STATISTICAL INFORMATION

LIST OF STATE BANKS.

Adair County—	
Farmers Bank.....	Casey Creek
Bank of Columbia.....	Columbia
State Bank.....	Gradyville
Anderson County—	
Farmers' Bank	Glensboro
Citizens' Bank & Trust Co.....	Lawrenceburg
State Bank	Van Buren
Ballard County—	
Bank of Barlow	Barlow
Kevil Bank	Kevil
Bank of LaCenter	LaCenter
Bank of Lovelaceville	Lovelaceville
Barren County—	
People's Bank	Cave City
Bank of Glasgow Junction	Glasgow Junction
Deposit Bank of Hiseville	Hiseville
Bath County—	
Bank of Bethel	Bethel
Farmers' Bank	Owingsville
Farmers' Trust Co.....	Owingsville
Owingsville Banking Co.....	Owingsville
Salt Lick Deposit Bank	Salt Lick
Citizens' Bank	Sharpsburg
Exchange Bank	Sharpsburg
Bell County—	
Citizens' Bank & Trust Co.....	Middlesboro
First State Bank	Pineville
Boone County—	
Boone County Deposit Bank	Burlington
People's Bank	Burlington
Deposit Bank	Florence
Citizens Deposit Bank	Grant
Farmers' Bank	Petersburg
Deposit Bank	Union
Equitable Bank & Trust Co.....	Walton
Walton Bank & Trust Co.....	Walton
State Bank	Verona
Bourbon County—	
Farmers' Bank	Clintonville
Exchange Bank	Millersburg
Farmers' Bank	Millersburg
Deposit Bank	North Middletown
Bourbon Agricultural Bank & Trust Co.....	Paris
Deposit & People's Bank	Paris
Citizens' Home Bank	Little Rock

Boyd County—	
Merchants' Bank & Trust Co.....	Ashland
Boyle County—	
Boyle Bank & Trust Co.....	Danville
First State Bank	Junction City
Bank of Perryville	Perryville
People's Bank	Perryville
Breathitt County—	
Hargis Commercial Bank & Trust Co.....	Jackson
Bracken County—	
Augusta German Bank	Augusta
Farmers' Equity Bank	Brooksville
Foster Banking Company	Foster
Bank of Germantown	Germantown
Farmers' & Traders' Bank	Germantown
Milford Bank	Milford
Breckinridge County—	
Breckinridge Bank	Cloverport
Bank of Cloverport	Cloverport
Bank of Hardinsburg & Trust Co.....	Hardinsburg
Farmers' Bank	Hardinsburg
First State Bank	Irvington
E. H. Shellman & Co.....	Irvington
Bullitt County—	
Lebanon Junction Bank	Lebanon Junction
People's Bank	Mt. Washington
Bullitt County Bank	Shepherdsville
People's Bank	Shepherdsville
Butler County—	
J. M. Carson Banking Co.....	Morgantown
Deposit Bank	Morgantown
Green River Deposit Bank	Rochester
Woodbury Deposit Bank	Woodbury
Caldwell County—	
Fredonia Valley Bank	Fredonia
Calloway County—	
Bank of Kirksey	Kirksey
Lynn Grove Bank	Lynn Grove
Bank of Murray	Murray
Farmers' & Merchants' Bank	Murray
Carlisle County—	
Bank of Arlington	Arlington
Deposit Bank	Bardwell
Bank of Milburn	Milburn
Carroll County—	
Deposit Bank	Ghent
Deposit Bank	Sanders
Deposit Bank	Worthville
Campbell County—	
Bank of Alexandria	Alexandria
Campbell County Bank	Bellevue
Bank of Dayton	Dayton
Central Savings Bank & Trust Co.....	Newport
Citizens' Commercial & Savings Bank.....	Newport
Citizens' Bank	Cold Springs

Carter County—	
Citizens' Bank	Grayson
Commercial Bank	Grayson
Carter County Commercial Bank	Olive Hill
People's Bank	Olive Hill
Casey County—	
People's Bank	Dunnville
Commercial Bank	Liberty
Farmers' Bank	Middleburg
Christian County—	
Bank of Crofton	Crofton
Bank of Hopkinsville	Hopkinsville
City Bank & Trust Co.....	Hopkinsville
Planters' Bank & Trust Co.....	Hopkinsville
Bank of Lafayette	Lafayette
Bank of Pembroke	Pembroke
Clark County—	
People's State Bank & Trust Co.....	Winchester
Winchester Bank	Winchester
Clinton County—	
Bank of Albany	Albany
Citizens' Bank	Albany
Crittenden County—	
Farmers' Bank	Marion
Marion Bank	Marion
Farmers' & Merchants' Bank	Tolu
Cumberland County—	
Bank of Cumberland	Burksville
Bank of Marrowbone	Marrowbone
Davies County—	
Central Trust Co.....	Owensboro
Farmers' & Traders' Bank	Owensboro
Fourth Street Bank	Owensboro
Owensboro Banking Co.....	Owensboro
Bank of Equity	Pleasant Ridge
Utica Deposit Bank	Utica
Farmers' Bank	West Louisville
Bank of Whitesville	Whitesville
Farmers' & Merchants' Bank	Whitesville
Edmonson County—	
Deposit Bank	Brownsville
Bank of Rocky Hill	Rocky Hill
Elliott County—	
Sandy Hook Bank	Sandy Hook
Estill County—	
Farmers' Bank of Estill County	Irvine
W. T. B. Williams & Son	Irvine
Fayette County—	
Bank of Commerce	Lexington
Security Trust Company	Lexington
Union Bank & Trust Company	Lexington
Title Guarantee & Trust Company.....	Lexington
Phoenix and Third Trust Company	Lexington

Fleming County—

Deposit Bank	Ewing
Deposit Bank of Pearce, Fant & Co.....	Flemingsburg
Fleming County Farmers' Bank	Flemingsburg
People's Bank	Flemingsburg
Farmers' Trust Company	Flemingsburg
Deposit Bank	Hillsboro

Floyd County—

Bank of Josephine	Prestonburg
Bank of Wayland	Wayland

Franklin County—

Capital Trust Company	Frankfort
Farmers' Deposit Bank	Frankfort
People's State Bank	Frankfort

Fulton County—

Farmers' Bank	Fulton
Hickman Bank & Trust Co.....	Hickman
Farmers' & Merchants' Bank	Hickman
People's Bank	Hickman

Gallatin County—

Union Bank	Glencoe
Deposit Bank	Sparta
Deposit Bank	Warsaw

Garrard County—

Bank of Bryantsville	Bryantsville
Garrard Bank & Trust Co.....	Lancaster
People's Bank	Paint Lick

Grant County—

Corinth Deposit Bank	Corinth
Farmers' Bank	Corinth
Tobacco Growers' Deposit Bank	Crittenden
Farmers' Bank of Equity	Dry Ridge
Deposit Bank	Mt. Zion
Bank of Williamstown	Williamstown
Grant County Deposit Bank	Williamstown
Deposit Bank	Jonesville

Graves County—

Bank of Fancy Farm	Fancy Farm
Bank of Farmington	Farmington
Bank of Lowes	Lowes
Exchange Bank	Mayfield
Graves County Bank & Trust Co.....	Mayfield
Citizens' Bank	Water Valley
Bank of Wingo	Wingo

Grayson County—

Big Clifty Banking Co.....	Big Clifty
Bank of Caneyville	Caneyville
Bank of Clarkson	Clarkson
Deposit Bank	Leitchfield
Grayson County State Bank	Leitchfield

Green County—

Deposit Bank	Greensburg
People's Bank	Greensburg

Greenup County—

Citizens State Bank	Greenup
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Hancock County—	
Hancock Deposit Bank	Hawesville
Hawesville Deposit Bank	Hawesville
Bank of Lewisport	Lewisport
Hardin County—	
Bank of Cecilian	Cecilian
Citizens' Trust Company	Elizabethtown
Union Bank & Trust Co.....	Elizabethtown
Glendale Banking Co.....	Glendale
Bank of Sonora	Sonora
People's Bank	Stithton
Stithton Bank	Stithton
Davis Banking Co.....	Upton
Farmers' Bank	Vine Grove
Vine Grove State Bank	Vine Grove
West Point Bank	West Point
Harlan County—	
People's Bank	Harlan
Harrison County—	
Berry Deposit Bank	Berry
Farmers' Deposit Bank	Berry
Harrison County Deposit Bank	Cynthiana
Sunrise Deposit Bank	Sunrise
Hart County—	
Canmer Deposit Bank	Canmer
Deposit Bank	Hardyville
Farmers' Deposit Bank	Horse Cave
Hart County Deposit Bank	Munfordville
Henderson County—	
Corydon Deposit Bank	Corydon
Farmers' Bank & Trust Co.....	Henderson
Henderson County Savings Bank.....	Henderson
Ohio Valley Bank & Trust Co.....	Henderson
People's Savings Bank	Henderson
Union Bank & Trust Co.....	Henderson
Deposit Bank	Smith's Mills
Henry County—	
United Loan & Deposit Bank	Campbellsburg
Deposit Bank	Eminence
Farmers' & Drovers' Bank	Eminence
People's Bank	Franklinton
Bank of Lockport	Lockport
Bank of New Castle	New Castle
Deposit Bank of Pleasureville	Pleasureville
Citizens' Bank	Port Royal
Smithfield Bank	Smithfield
Deposit Bank	Sulphur
Farmers' Bank	Turner's Station
Hickman County—	
Bank of Clinton	Clinton
Bank of Columbus	Columbus
Moscow Bank	Moscow
Hopkins County—	
Bank of Dawson	Dawson Springs
Commercial Bank	Dawson Springs
Bank of Earlington	Earlington
People's Bank	Earlington

Hopkins County Bank	Madisonville
Kentucky Bank & Trust Co.....	Madisonville
Planters' Bank	Morton's Gap
Citizens Bank	Nebo
Farmers' Bank	White Plains
Hansom Banking Company	Hansom
Jefferson County—	
Bank of Buechel	Buechel
Jefferson County Bank	Jeffersontown
Bank of Middletown	Middletown
Bank of Prospect	Prospect
Bank of St. Matthews	St. Matthews
Bank of St. Helens	Shively
Fidelity and Columbia Trust Co.....	Louisville
German Bank	Louisville
German Insurance Bank	Louisville
German Security Bank	Louisville
Kentucky Title Savings Bank & Trust Co.....	Louisville
Lincoln Savings Bank	Louisville
South Louisville Savings & Deposit Bank.....	Louisville
Stock Yards Bank	Louisville
Louisville Trust Co.....	Louisville
United States Trust Co.....	Louisville
Jessamine County—	
Citizens' Bank of Jessamine	Nicholasville
Farmers' Exchange Bank	Nicholasville
Wilmore Deposit Bank	Wilmore
Johnson County—	
Paintsville Bank & Trust Co.....	Paintsville
Jackson County—	
Jackson County Bank	McKee
Kenton County—	
Central Savings Bank & Trust Co.....	Covington
Covington Savings Bank & Trust Co.....	Covington
Latonia Deposit Bank	Covington
People's Savings Bank & Trust Co.....	Covington
Western German Savings Bank	Covington
Citizens' Bank	Erlanger
Erlanger Deposit Bank	Erlanger
Bank of Independence	Independence
Farmers' & Merchants' Bank	Ludlow
Ludlow Savings Bank	Ludlow
Knott County—	
Bank of Hindman	Hindman
Larue County—	
Savings Bank of Buffalo	Buffalo
Laurel County—	
Farmers' State Bank	London
Lawrence County—	
Bank of Blaine	Blaine
Lee County—	
Lee County Deposit Bank	Beattyville
People's Exchange Bank	Beattyville
Leslie County—	
Hyden Citizens' Bank	Hyden

Letcher County—

Union Bank	Whitesburg
Bank of McRoberts	Fleming

Lewis County—

Bank of Tolesboro	Tolesboro
Citizens' Bank	Vanceburg
Deposit Bank	Vanceburg

Lincoln County—

Crab Orchard Banking Co.....	Crab Orchard
People's Bank	Hustonville
Deposit Bank	McKinney
Bank of Moreland	Moreland
Waynesburg Deposit Bank	Waynesburg

Livingston County—

Farmers' Bank	Birdsville
Citizens' Bank	Carrsville
Salem Bank	Salem
Smithland Bank	Smithland
Bank of Tiline	Tiline

Logan County—

People's Bank	Adairville
Bank of Auburn	Auburn
G. W. Davidson & Co.....	Auburn
Lewisburg Banking Co.....	Lewisburg
Bank of Russellville	Russellville

Lyon County—

Citizens' Bank	Kuttawa
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Madison County—

Berea Bank & Trust Co.....	Berea
Farmers' Bank	Kirksville
State Bank & Trust Co.....	Richmond
Waco Deposit Bank	Waco

Marion County—

Rolling Fork Bank	Bradfordsville
People's Bank	Gravel Switch
Bank of Raywick	Raywick

Marshall County—

Bank of Benton	Benton
Bank of Marshall County	Benton
Bank of Birmingham	Birmingham
Calvert Bank	Calvert City
Bank of Gilbertsville	Gilbertsville
Hardin Bank	Hardin

Martin County—

Inez Bank	Inez
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Mason County—

Citizens' Bank	Dover
Equitable Trust Co.....	Dover
Bank of Mayslick	Mayslick
Farmers' & Traders' Bank	Maysville
Standard Bank	Maysville
State Trust Co.....	Maysville
Union Bank & Trust Co.....	Maysville
Farmers' Bank	Sardis

McCracken County—

Citizens' Savings Bank	Paducah
Merchants' Trust & Savings Bank	Paducah
Paducah Banking Co.....	Paducah

McCreary County—

Pine Knot Banking Co.....	Pine Knot
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McLean County—

McLean County Bank	Beech Grove
Bank of Calhoun	Calhoun
Citizens' Deposit Bank	Calhoun
Island Deposit Bank	Island
Farmers' & Merchants' Bank	Livermore
Sacramento Deposit Bank	Sacramento

Meade County—

Farmers' Deposit Bank	Brandenburg
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Mercer County—

Citizens' Bank	Burgin
Union Bank	Cornishville
State Bank & Trust Co.....	Harrodsburg
Farmers' Bank	Salvisa
Farmers' Trust Co.....	Harrodsburg

Metcalf County—

Farmers' & Merchants' Bank	Edmonton
People's Bank of Metcalfe County	Edmonton
Bank of Summershade	Summershade

Monroe County—

Bank of Fountain Run	Fountain Run
Gamaliel Bank	Gamaliel
People's Bank	Tompkinsville
Deposit Bank of Monroe County	Tompkinsville

Montgomery County—

Exchange Bank of Kentucky	Mt. Sterling
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Morgan County—

Commercial Bank	West Liberty
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Muhlenberg County—

Deposit Bank	Bremen
Gish Banking Co.....	Central City
Farmers' State Bank	Greenville
Citizens' Bank	Drakesboro
Citizens' Banking Co.....	South Carrollton

Nelson County—

Farmers' Bank & Trust Co.....	Bardstown
People's Bank	Bardstown
Wilson & Muir	Bardstown
Citizens' Bank	Bloomfield
Muir & Wilson	Bloomfield
Boston Banking Co.....	Boston
Bank of Fairfield	Fairfield
Farmers' Bank	Chaplin
Bank of New Haven	New Haven
People's Bank	New Hope

Nicholas County—

Deposit Bank	Carlisle
Farmers' Bank	Carlisle
Moorefield Deposit Bank	Moorefield

Ohio County—	
Deposit Bank	Beaver Dam
Farmers' Bank	Centertown
Deposit Bank	Dundee
Bank of Fordsville	Fordsville
Bank of Hartford	Hartford
Citizen's Bank	Hartford
Deposit Bank	McHenry
Deposit Bank	Rockport
Oldham County—	
State Bank	Crestwood
Oldham Bank & Trust Co.	Lagrange
People's Bank	Lagrange
State Bank	Pewee Valley
Owen County—	
Deposit Bank	Gratz
First State Bank	Monterey
Citizens' Bank	New Liberty
People's Bank	Owenton
Farmers' Bank	Wheatley
Owsley County—	
Owsley County Deposit Bank	Booneville
Pendleton County—	
Deposit Bank	Butler
Citizens' Bank	Falmouth
Pendleton Bank	Falmouth
Farmers' Bank	Morgan
Perry County—	
Perry County State Bank	Hazard
Pike County—	
First State Bank of Elkhorn City	Praise
Powell County—	
Powell County Deposit Bank	Stanton
Pulaski County—	
First State Bank	Eubanks
People's Bank	Science Hill
Citizens' Bank	Somerset
Rockcastle County—	
Citizens' Bank	Brodhead
Bank of Mt. Vernon	Mt. Vernon
People's Bank	Mt. Vernon
Rowan County—	
State Bank	Morehead
People's Bank	Morehead
Russell County—	
Bank of Jamestown	Jamestown
Bank of Russell Springs	Russell Springs
Robertson County—	
Farmers' & Traders' Bank	Mt. Olivet
Robertson State Bank	Mt. Olivet
Scott County—	
Farmers' Bank & Trust Co.	Georgetown
Deposit Bank	Sadieville
Farmers' Bank	Sadieville
Citizens' Bank	Stamping Ground

Shelby County—

People's Bank	Bagdad
Deposit Bank	Cropper
Bank of Finchville	Finchville
Bank of Mt. Eden	Mt. Eden
Bank of Shelbyville	Shelbyville
Citizens' Bank	Shelbyville
Farmers' & Traders' Bank	Shelbyville
People's Bank & Trust Co.....	Shelbyville
Shelby County Trust & Banking Co.....	Shelbyville
Bank of Simpsonville	Simpsonville
Citizens' Bank	Waddy

Simpson County—

McElwain-Meguiar Bank & Trust Co.....	Franklin
Simpson County Bank	Franklin

Spencer County—

Bank of Taylorsville	Taylorsville
People's Bank	Taylorsville

Taylor County—

Bank of Campbellsville	Campbellsville
Farmers' Deposit Bank	Campbellsville

Trigg County—

Cadiz Bank	Cadiz
Trigg County Farmers' Bank	Cadiz
Bank of Cerulean	Cerulean
Bank of Golden Pond	Golden Pond

Trimble County—

Bedford Loan & Deposit Bank	Bedford
Farmers' Bank	Milton

Todd County—

Bank of Allensville	Allensville
Bank of Elkton	Elkton
Farmers' & Merchants' Bank	Elkton
Bank of Guthrie	Guthrie
Farmers' & Merchants' Bank	Guthrie
Bank of Kirkmansville	Kirkmansville
Bank of Trenton	Trenton
Planters' Bank	Trenton
Planters' Trust Company	Trenton

Union County—

Bank of Union County	Morganfield
People's Bank & Trust Co.....	Morganfield
Bank of Sturgis	Sturgis
Farmers' Bank	Uniontown
Bank of Waverly	Waverly

Warren County—

Bowling Green Trust Co.....	Bowling Green
Potter-Matlock Trust Co.....	Bowling Green
Warren State Bank	Bowling Green
Oakland Bank	Oakland
Deposit Bank	Smith's Grove
Farmers' Bank	Smith's Grove
Bank of Woodburn	Woodburn

Washington County—	
Farmers' Bank	Mackville
People's Deposit Bank	Springfield
State Bank	Springfield
Central Bank	Willisburg
Wayne County—	
Monticello Banking Company	Monticello
Webster County—	
Blackford Bank	Blackford
Webster County Bank	Clay
Bank of Dixon	Dixon
Deposit Bank	Poole
Citizens' Bank	Providence
Providence Banking Co.	Providence
Deposit Bank	Sebree
Farmers' & Merchants' Bank	Slaughterville
Whitley County—	
Bank of Williamsburg	Williamsburg
Farmers' Bank & Trust Co.....	Williamsburg
Wolfe County—	
Farmers' & Traders' Bank	Campton
Hazel Green Bank	Hazel Green
Woodford County—	
Citizens' Bank	Midway
Commercial Bank	Midway
Farmers' Bank	Mortonsville
J. Amsden & Co.....	Versailles
Harris-Seller Banking Co.....	Versailles
Woodford Bank & Trust Co.....	Versailles

NATIONAL BANKS.

FURNISHED BY THE COMPTROLLER OF THE CURRENCY.

Adairville—First National Bank of Adairville.
 Ashland—Second National Bank of Ashland.
 Ashland—Ashland National Bank of Ashland.
 Augusta—Farmers' National Bank of Augusta.
 Barbourville—First National Bank of Barbourville.
 Barbourville—Bank of John A. Black of Barbourville.
 Bardwell—First National Bank of Bardwell.
 Berea—Berea National Bank.
 Bowling Green—American National Bank of Bowling Green.
 Brooksville—First National Bank of Brooksville.
 Burnside—First National Bank of Burnside.
 Campbellsville—Taylor National Bank of Campbellsville.
 Cannel City—Morgan County National Bank of Cannel City.
 Carlisle—First National Bank of Carlisle.
 Carrollton—First National Bank of Carrollton.
 Carrollton—Carrollton National Bank.
 Catlettsburg—Catlettsburg National Bank.
 Catlettsburg—Kentucky National Bank of Catlettsburg.
 Cave City—H. Y. Davis National Bank of Cave City.
 Central City—First National Bank of Central City.
 Clay—Farmers' National Bank of Clay.

Clay City—Clay City National Bank.
Clinton—First National Bank of Clinton.
Columbia—First National Bank of Columbia.
Corbin—First National Bank of Corbin.
Corbin—Whitley National Bank of Corbin.
Covington—First National Bank of Covington.
Covington—Citizens' National Bank of Covington.
Covington—German National Bank of Covington.
Cynthiana—Farmers' National Bank of Cynthiana.
Cynthiana—National Bank of Cynthiana.
Danville—Citizens' National Bank of Danville.
Danville—Farmers' National Bank of Danville.
Dry Ridge—First National Bank of Dry Ridge.
Eddyville—First National Bank of Eddyville.
Elizabethtown—The First National Bank of Elizabethtown.
East Bernstadt—First National Bank of East Bernstadt.
Frankfort—National Branch Bank of Kentucky.
Frankfort—State National Bank of Kentucky of Frankfort.
Fulton—First National Bank of Fulton.
Fulton—City National Bank of Fulton.
Georgetown—First National Bank of Georgetown.
Georgetown—Georgetown National Bank.
Glasgow—First National Bank of Glasgow.
Glasgow—Citizens' National Bank of Glasgow.
Glasgow—Farmers' National Bank of Glasgow.
Glasgow—Trigg National Bank of Glasgow.
Greenup—First National Bank of Greenup.
Greenville—First National Bank of Greenville.
Harlan—First National Bank of Harlan.
Harrodsburg—First National Bank of Harrodsburg.
Harrodsburg—Mercer National Bank of Harrodsburg.
Hazard—First National Bank of Hazard.
Henderson—Henderson National Bank.
Hodgenville—Farmers' National Bank of Hodgenville.
Hodgenville—LaRue National Bank of Hodgenville.
Hopkinsville—First National Bank of Hopkinsville.
Horse Cave—First National Bank of Horse Cave.
Hustonville—National Bank of Hustonville.
Jackson—First National Bank of Jackson.
Jenkins—First National Bank of Jenkins.
Lancaster—Citizens' National Bank of Lancaster.
Lancaster—National Bank of Lancaster.
Latonía—First National Bank of Latonia.
Lawrenceburg—Anderson National Bank of Lawrenceburg.
Lawrenceburg—Lawrenceburg National Bank.
Lebanon—Citizens' National Bank of Lebanon.
Lebanon—Farmers' National Bank of Lebanon.
Lebanon—Marion National Bank of Lebanon.
Lexington—Second National Bank of Lexington.
Lexington—Fayette National Bank of Lexington.
Lexington—First and City National Bank of Lexington.
Lexington—Phoenix and Third National Bank of Lexington.
London—National Bank of London.
Louisa—First National Bank of Louisa.
Louisa—Louisa National Bank.
Louisville—First National Bank of Louisville.
Louisville—American Southern National Bank of Louisville.
Louisville—Citizens' National Bank of Louisville.
Louisville—Louisville National Banking Company.

Louisville—National Bank of Commerce of Louisville.
Louisville—National Bank of Kentucky.
Louisville—Union National Bank of Louisville.
Ludlow—First National Bank of Ludlow.
Madisonville—Farmers' National Bank of Madisonville.
Manchester—First National Bank of Manchester.
Mayfield—First National Bank of Mayfield.
Mayfield—Farmers' National Bank of Mayfield.
Mayfield—City National Bank of Mayfield.
Maysville—First National Bank of Maysville.
Maysville—Bank of Maysville National Banking Association.
Maysville—State National Bank of Maysville.
Middlesboro—National Bank of Middlesboro.
Monticello—Citizens' National Bank of Monticello.
Morganfield—Morganfield National Bank.
Mount Sterling—Montgomery National Bank of Mount Sterling.
Mount Sterling—Mount Sterling National Bank.
Mount Sterling—Traders' National Bank of Mount Sterling.
Newport—German National Bank of Newport.
Newport—Newport National Bank.
Nicholasville—First National Bank of Nicholasville.
Owensboro—First National Bank of Owensboro.
Owensboro—National Depository Bank of Owensboro.
Owensboro—United States National Bank of Owensboro.
Owenton—First National Bank of Owenton.
Owenton—Farmers' National Bank of Owenton.
Paducah—First National Bank of Paducah.
Paducah—City National Bank of Paducah.
Paintsville—Paintsville National Bank.
Paris—First National Bank of Paris.
Pikeville—First National Bank of Pikeville.
Pikeville—Pikeville National Bank.
Pineville—Bell National Bank of Pineville.
Prestonsburg—First National Bank of Prestonsburg.
Princeton—First National Bank of Princeton.
Princeton—Farmers' National Bank of Princeton.
Providence—Union National Bank of Providence.
Richmond—Citizens' National Bank of Richmond.
Richmond—Madison National Bank of Richmond.
Richmond—Southern National Bank of Richmond.
Russell—First National Bank of Russell.
Russellville—Citizens' National Bank of Russellville.
Russellville—National Depository Bank of Russellville.
Salyersville—Salyersville National Bank.
Scottsville—First National Bank of Scottsville.
Scottsville—Allen County National Bank of Scottsville.
Sebree—First National Bank of Sebree.
Somerset—First National Bank of Somerset.
Somerset—Farmers' National Bank of Somerset.
Springfield—First National Bank of Springfield.
Stanford—First National Bank of Stanford.
Stanford—Lincoln County National Bank of Stanford.
Sturgis—First National Bank of Sturgis.
Whitesburg—First National Bank of Whitesburg.
Wickliffe—First National Bank of Wickliffe.
Williamsburg—First National Bank of Williamsburg.
Wilmore—First National Bank of Wilmore.
Winchester—Citizens' National Bank of Winchester.
Winchester—Clark County National Bank of Winchester.

POPULATION OF KENTUCKY CITIES

AS SHOWN BY UNITED STATES CENSUS 1910.

Ashland	8,688	10,350
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FIRST-CLASS.

	1910 U. S. Census	1915 Estimation by Mayor
Louisville	223,928	276,500

SECOND-CLASS.

Lexington	35,099	*41,166
Covington	53,270	60,000
Newport	30,309	32,000
Paducah	22,760	30,000

THIRD-CLASS.

Owensboro	16,011	18,000
Henderson	11,452	15,000
Frankfort	10,465	11,500
Bowling Green	9,173	12,500
Middlesboro	7,305	9,000
Hopkinsville	9,419	10,320

FOURTH-CLASS.

Shelbyville	3,412	4,750
Maysville	6,141	7,500
Richmond	5,340	6,500
Winchester	7,156	10,000
Dayton	6,979	10,595
Paris	5,859	8,000
Catlettsburg	3,520	5,000
Danville	5,420	7,000
Mt. Sterling	3,932	4,500
Georgetown	4,533	4,500
Versailles	2,268	2,700
Harrodsburg	3,147	3,800
Bellevue	6,683	6,950
Cynthiana	3,603	4,000
Mayfield	5,916	7,250
Lebanon	3,077	3,575
Ludlow	4,163	4,456
Nicholasville	2,935	3,000
Pineville	2,161	4,100
Madisonville	4,966	6,000
Princeton	3,015	3,500
Fulton	2,575	4,000
Lawrenceburg	1,723	3,000

*Conservative.

Russellville	3,111	3,350
Carrollton	1,906	3,300
Central City	2,545	5,000
Corbin	2,589	4,750
Whitley City	157	700
Franklin	3,063	3,500
Barbourville	1,633	2,000
London	1,638	2,000
Providence	2,084	3,250
Morganfield	2,725	3,200
Pikeville	1,280	2,500
Somerset	4,491	5,000
Murray	2,089	3,100

FIFTH-CLASS.

Lancaster	1,507	1,800
Cadiz	1,005	1,250
Jackson	1,346	2,500
Hazard	537	3,800
Grand Rivers	(Not given)	460
Greenville	1,604	2,000
Louisa	1,356	1,625
Columbus	970	950
Glasgow	2,316	2,500
West Covington	1,751	1,707
Earlington	3,931	3,950
Hickman	2,736	4,000
Cloverport	1,403	1,850 to 2,000
Bardstown	2,126	2,200
Augusta	1,787	2,000
Stanford	1,532	1,850
Williamsburg	2,004	2,050
Clinton	1,497	1,650
Midway	937	1,200
Flemingsburg	1,219	1,600
Elkton	1,228	1,800
Falmouth	1,180	1,600
Vanceburg	1,145	1,240
Carlisle	1,293	2,500
Uniontown	1,356	1,500
Campbellsville	269	1,500
Hawesville	1,002	1,100
Eminence	1,274	1,540
Eddyville	1,442	1,442
Leitchfield	1,053	1,500
Owingsville	942	1,000
Marion	1,627	2,500
Sebree	1,500	2,000
Clay	1,098	2,400
Wickliffe	989	1,200
Morehead	1,105	1,500
Bardwell	1,087	1,600
Sturgis	1,467	2,100
Dawson Springs	1,350	1,600
Millersburg	799	1,100
Calhoun	742	750
Springfield	1,329	2,000
Corydon	942	1,450

Hartford	976	1,050
Morton's Gap	1,266	1,425
Livermore	1,220	1,400
Beattyville	1,360	1,400
Owenton	1,024	1,250
Scottsville	1,327	1,800
Olive Hill	1,132	2,768
Burnside	1,117	1,200
Prestonsburg	1,120	2,500
Warsaw	900	900
Monticello	1,338	1,475
Berea	1,510	1,700
Lagrange	1,152	1,512
Guthrie	1,096	1,500
Russell	1,038	1,500
Hustonville	384	500
Elizabethtown	1,970	2,668
Drakesboro	1,126	1,200
Tompkinsville	639	950
Irvine	272	2,100

LEGAL WEIGHT PER BUSHEL IN KENTUCKY ON VARIOUS ARTICLES.

Section 4821 of the Kentucky Statutes provides that the following shall be the legal weights in Kentucky and said weights shall constitute a bushel of each article named:

Wheat, 60 pounds.
 Shelled corn, 56 pounds.
 Corn in the ear, 70 pounds, November 1st to May 1st.
 Corn, 68 pounds, May 1st to November 1st following.
 Rye, 56 pounds.
 Oats, shelled, 32 pounds.
 Barley, 47 pounds.
 Irish potatoes, 60 pounds.
 Sweet potatoes, 55 pounds.
 White beans, 60 pounds.
 Castor beans, 45 pounds.
 Clover seed, 60 pounds.
 Timothy seed, 45 pounds.
 Flax seed, 56 pounds.
 Millet seed, 50 pounds.
 Peas, 60 pounds.
 Bluegrass seed, 14 pounds.
 Buckwheat, 56 pounds.
 Dried apples, 24 pounds.
 Dried peaches, 39 pounds.
 Onions, 57 pounds.
 Bottom onion sets, 36 pounds.
 Salt, 50 pounds.
 Stone coal, 76 pounds.

The term coal includes anthracite, cannel, bituminous and other mined coal.

Bran, 20 pounds.

Plastering hair, 8 pounds.

Turnips, 60 pounds.

Unslaked lime, 35 pounds.

Corn meal, 50 pounds.

Fine salt, 55 pounds.

Hungarian grass seed, 50 pounds.

Ground peas, 24 pounds.

Orchard grass seed, 14 pounds.

English bluegrass seed, 14 pounds.

Hemp seed, 44 pounds.

SILOS IN KENTUCY BY COUNTIES.

The number of silos in this State has increased very rapidly in the last two years. An effort has been made to ascertain as nearly as possible the number and classification of silos in each county, and while it is not claimed that this table is absolutely correct, the estimates have been made by one or more persons living in the county in each instance. There are approximately four thousand silos in Kentucky at the present time, where there were a little over two thousand two years ago. This increase at the rate of one thousand per year is very gratifying to those interested in the agricultural development of the State:

COUNTY	Wood	Concrete	Tile	Miscellaneous	Total
Adair	15	.....	.....	.....	15
Allen	4	2	.....	.....	6
Anderson .....	.....	.....	.....	20	20
Ballard	9	5	.....	.....	14
Barren	100	.....	.....	.....	100
Bath	16	1	.....	.....	17
Bell	4	.....	.....	.....	4
Boone	67	2	1	.....	70
Bourbon	12	18	6	.....	36
Boyd	14	1	2	1	18
Boyle	15	50	.....	.....	65
Bracken	27	7	.....	.....	34

COUNTY	Wood	Concrete	Tile	Miscellaneous	Total
Breathitt .....	.....	.....	.....	.....	.....
Breckinridge	15	.....	.....	.....	15
Bullitt	100	5	.....	.....	105
Butler	2	.....	3	.....	5
Caldwell	15	.....	.....	.....	15
Calloway	8	.....	.....	.....	8
Campbell	75	.....	.....	.....	75
Carlisle	2	2	.....	.....	4
Carroll	10	2	.....	.....	12
Carter	2	1	.....	.....	3
Casey	6	.....	.....	.....	6
Christian	175	25	1	.....	201
Clark	12	8	.....	.....	20
Clay .....	.....	.....	.....	.....	.....
Clinton	3	.....	.....	.....	3
Crittenden	25	5	.....	3	33
Cumberland	8	.....	.....	.....	8
Daviess	105	5	4	1	115
Edmonson .....	.....	.....	.....	.....	.....
Elliott .....	.....	.....	.....	.....	.....
Estill	1	.....	.....	.....	1
Fayette	180	105	15	.....	300
Fleming	77	3	3	2	85
Floyd .....	.....	.....	.....	.....	.....
Franklin	49	31	.....	.....	80
Fulton .....	.....	.....	.....	11	11
Gallatin .....	.....	.....	.....	15	15
Garrard .....	.....	.....	.....	.....	.....
Grant	31	.....	.....	.....	31
Graves	10	2	.....	.....	12
Grayson	70	.....	.....	.....	70
Green .....	.....	1	.....	.....	1
Greenup	16	.....	.....	.....	16
Hancock	10	.....	.....	.....	10
Hardin	30	20	15	10	75
Harlan .....	.....	.....	.....	.....	.....
Harrison	50	16	3	4	73
Hart	10	.....	.....	.....	10
Henderson	14	30	5	.....	49
Henry	48	2	.....	.....	50
Hickman	6	.....	.....	.....	6
Hopkins	5	2	3	.....	10
Jackson .....	.....	1	.....	.....	1
Jefferson	450	4	2	.....	456
Jessamine	40	3	2	5	50
Johnson	1	.....	.....	.....	1
Kenton	40	2	.....	5	47
Knott	2	.....	.....	.....	2

COUNTY	Wood	Concrete	Tile	Miscellaneous	Total
Knox	.....	.....	.....	.....	.....
Larue	5	.....	.....	.....	5
Laurel	.....	.....	.....	.....	.....
Lawrence	4	6	.....	1	11
Lee	.....	.....	.....	1	1
Leslie	.....	.....	.....	.....	.....
Letcher	.....	.....	.....	.....	.....
Lewis	25	.....	.....	.....	25
Lincoln	200	100	.....	.....	300
Livingston	5	2	.....	.....	7
Logan	21	5	1	.....	27
Lyon	2	3	.....	.....	5
Madison	20	5	1	.....	26
Magoffin	.....	.....	.....	.....	.....
Marion	10	10	.....	.....	20
Marshall	.....	.....	.....	.....	.....
Martin	.....	.....	.....	.....	.....
Mason	75	5	1	.....	81
McCracken	14	17	2	.....	33
McCreary	.....	.....	.....	.....	.....
McLean	15	5	.....	.....	20
Meade	30	5	.....	.....	35
Menifee	.....	.....	.....	.....	.....
Mercer	38	1	.....	.....	39
Metcalfe	5	.....	.....	4	9
Monroe	1	.....	.....	.....	1
Montgomery	50	.....	3	.....	53
Morgan	.....	.....	.....	.....	.....
Muhlenberg	5	4	.....	.....	9
Nelson	45	6	4	.....	55
Nicholas	30	2	.....	.....	32
Ohio	4	.....	2	.....	6
Oldham	120	5	4	.....	129
Owen	12	.....	.....	.....	12
Owsley	.....	.....	.....	.....	.....
Pendleton	100	.....	.....	5	105
Perry	.....	.....	.....	.....	.....
Pike	3	.....	.....	.....	3
Powell	2	.....	.....	.....	2
Pulaski	3	6	.....	1	10
Robertson	3	3	1	.....	7
Rockcastle	2	.....	.....	.....	2
Rowan	.....	.....	.....	.....	.....
Russell	.....	.....	.....	.....	.....
Scott	20	25	.....	.....	45
Shelby	200	10	2	.....	212
Simpson	12	5	2	.....	19
Spencer	45	.....	.....	.....	45

COUNTY	Wood	Concrete	Tile	Miscellaneous	Total
Taylor	3	6	.....	1	10
Todd	15	2	2	2	21
Trigg	7	5	.....	1	13
Trimble	8	1	1	.....	10
Union	70	35	1	.....	106
Warren	100	50	1	5	156
Washington	17	10	.....	.....	27
Wayne	2	13	.....	.....	15
Webster	21	.....	.....	.....	21
Whitley	1	.....	.....	.....	1
Wolfe	1	.....	.....	.....	1
Woodford	50	20	1	.....	71
Total					4,332

DEPARTMENT OF PUBLIC ROADS.

OFFICE FORCE.

R. C. Terrell, Commissioner of Public Roads.

BRIDGE DEPARTMENT.

R. Wiley, Bridge Engineer.
 Prof. W. J. Carroll, Assistant Bridge Engineer.
 E. G. Collins, Draftsman.
 Howard Williams, Draftsman.
 C. P. Schneider, Draftsman.
 Samuel D. Lykens, Stenographer.

ROADS DEPARTMENT.

R. H. Reese, First Assistant Highway Engineer.
 R. Y. Hollingsworth, Draftsman.
 L. O. Taylor, Accountant.
 J. M. Kendall, Chief Clerk.
 Carroll Speer, Blue Print Assistant.
 Miss Marguerite Noonan, Stenographer.
 Mrs. Frank W. Freeman, Stenographer.

DIVISION ENGINEERS.

District No. 1.....	Walter F. Brooks
District No. 2.....	J. A. Whitaker
District No. 3.....	J. F. Grimes
District No. 4.....	Walter E. Rowe
District No. 5.....	Lewis T. Haney
District No. 6.....	(Head Office)
District No. 7.....	M. D. Ross
District No. 8.....	R. E. Toms
District No. 9.....	W. L. McDyer
District No. 10.....	T. B. Webber

STATE ROAD INSPECTORS ON DUTY SEPTEMBER 7, 1915.

W. A. Brownfield	G. B. Jeffries
J. A. Higgins	W. F. Downing
W. R. Tipton	C. C. Crabbe
H. N. Claggett	C. H. Schwartz
R. L. Ehrlich	Wm. A. Obenchain
J. E. Robertson	Roy J. Soursley
G. R. Allison	A. W. Davies
F. H. Yancey	W. C. Stone
Samuel Bailey	T. Freeman
John S. Thornton	Louis P. Kennedy
J. G. Estes	Chas. W. Lovell
P. A. McGovern	T. M. Foster
J. B. Burton	H. L. Prather
M. P. Welch	B. T. Moynahan
A. J. Bright	R. L. Curtis
Arthur S. Patrick	H. C. Alexander
Wm. Addams	Hugh Crozar
A. L. Chambers	Geo. O. Harding
K. C. Lee	Townsel Combs
Clarence Gough	Sherry B. Smith
Beecher Combs	R. L. Wiley
E. J. Henry	Vernon P. Ligon
F. M. Talliaferro	O. H. Taylor
L. W. Hardin	E. M. Arnold
Lee Talliaferro	S. H. McChord

COUNTY ROAD ENGINEERS—1915.

Adair.....	J. N. Coffey
Allen.....	J. W. Crowe
Anderson.....	M. C. Champion
Ballard.....	R. I. Birney
Barren.....	J. C. Greer
Bath.....	W. H. Rogers
Bell.....	J. H. Bailey
Boone.....	C. W. Goodridge
Bourbon.....	B. F. Befford
Boyd.....	W. E. VanHorn
Boyle.....	Will P. Caldwell
Bracken.....	Omer Myers
Breathitt.....	J. O. Crawford
Breckinridge.....	R. M. Basham
Bullitt.....	W. C. Herps
Butler.....	A. J. Bradley

Caldwell.....	J. E. Pilant
Calloway.....	J. D. Houston
Campbell.....	J. E. Ratcliff
Carlisle.....	Hays Moore
Carroll.....	Jas. L. Booth
Carter.....	Jno. E. Thornberry (Judge)
Casey.....	L. J. Cochran
Christian.....	J. H. Dillman
Clark.....	G. J. Hunt
Clay.....	D. Y. Lyttle (Judge)
Clinton.....	J. P. Garrett (Judge)
Crittenden.....	M. A. Wilson
Cumberland.....	R. D. Bass
Daviess.....	J. W. Spurrier
Edmonson.....	Jno. A. Logan (Judge)
Elliott.....	S. L. Green (Judge)
Estill.....	James Winn
Fayette.....	R. W. Davis
Fleming.....	A. P. Darnall
Floyd.....	T. B. Akers
Franklin.....	A. D. Calvert
Fulton.....	Paff Hawkins
Gallatin.....	W. P. Crouch
Garrard.....	J. O. Bogie
Grant.....	W. H. Beverly
Graves.....	Hollie Ford
Grayson.....	Ed. Butler
Green.....	P. F. Marshall
Greenup.....	R. M. Scott
Hancock.....	F. W. Friel
Hardin.....	R. P. Franks
Harlan.....	W. F. Howard
Harrison.....	J. R. Poindexter
Hart.....	B. F. Bacon
Henderson.....	S. H. Kimel
Henry.....	E. K. Watkins
Hickman.....	H. C. Brummel
Hopkins.....	I. B. Earle
Jackson.....	J. D. Spurlock (Judge)
Jefferson.....	J. Russell Gaines
Jessamine.....	C. S. Woodward
Johnson.....	A. E. Auxier
Kenton.....	E. C. Mills
Knox.....	C. B. Parrott
Knott.....	E. W. Richie
Larue.....	Jacob Strous
Laurel.....	W. L. Brown (Judge)
Lawrence.....	B. J. Calloway
Lee.....	Green Kilburn (Judge)
Leslie.....	R. L. Hixon
Letcher.....	I. N. Lewis
Lincoln.....	J. L. McKee
Lewis.....	I. W. Sanders
Livingston.....	R. S. Paris
Logan.....	E. L. Traughber
Lyon.....	T. J. Rogers
Madison.....	J. G. Baxter
Magoffin.....	W. J. Patrick
Marion.....	J. A. Burton

Marshall.....	W. A. Fields
Martin.....	L. P. Kirk
Mason.....	C. T. Moore
McCracken.....	J. R. Thompson
McLean.....	W. H. Ballentine
McCreary.....	J. E. Williams
Meade.....	S. L. Morgan
Menifee.....	C. L. Whitt
Mercer.....	A. T. McGlone
Metcalfe.....	R. B. DeMumbrum
Monroe.....	W. S. Harlan
Montgomery.....	W. F. Crooks
Morgan.....	W. B. Allen
Muhlenberg.....	S. O. Sears
Nelson.....	T. P. Stoner
Nicholas.....	J. W. Williams
Ohio.....	T. H. Benton
Oldham.....	S. E. DeHaven
Owen.....	W. C. Jacobs
Owsley.....	A. B. Seale
Pendleton.....	H. H. Shoemaker
Perry.....	S. M. Boggs
Pike.....	H. H. Stallard
Powell.....	J. E. Burgher
Pulaski.....	W. C. Cundiff
Robertson.....	N. B. Massey
Rockcastle.....	J. W. Marler
Russell.....	A. M. F. Hall
Rowan.....	J. W. Riley
Scott.....	J. E. Prather
Shelby.....	G. M. Middleton
Simpson.....	Otho Haydon, Jr.
Spencer.....	I. F. Jewell
Todd.....	A. B. Wilkins (Judge)
Taylor.....	Fred Faulkner
Trigg.....	G. S. Dunning
Trimble.....	W. L. Harmon
Union.....	Lee Thomas
Warren.....	M. H. Crump
Washington.....	G. C. Donahue
Wayne.....	A. J. Cress
Webster.....	J. O. Tolbert
Whitley.....	H. F. Davis
Wolfe.....	E. J. Creech
Woodford.....	W. H. Edwards, Jr.

LIST OF FIRMS FROM WHOM ACID PHOSPHATE
MAY BE OBTAINED IN CARLOAD LOTS.

The American Agricultural Chemical Company.....	Cincinnati, O.
The Armour Fertilizer Works.....	Nashville, Tenn.
The Cincinnati Phosphate Company.....	Cincinnati, O.
Continental Fertilizer Company.....	Louisville, Ky.
Duncan & Bro.....	Lagrange, Ky.

The Empire Guano Company.....	Nashville, Tenn.
The Evansville Packing Company.....	Evansville, Ind.
Federal Chemical Company.....	Louisville, Ky.
The Groves Company.....	Cincinnati, O.
W. A. Guenther & Sons.....	Owensboro, Ky.
Hopkins Fertilizer Company.....	New Albany, Ind.
International Agricultural Corporation.....	Nashville, Tenn.
The Jarecki Chemical Company.....	Cincinnati, O.
Jones Fertilizer Company.....	Louisville, Ky.
The Kaufman Fertilizer Company.....	Cincinnati, O.
Louisville Fertilizer Company.....	Louisville, Ky.
Mt. Pleasant Fertilizer Company.....	Mt. Pleasant, Tenn.
Read Phosphate Company.....	Nashville, Tenn.
Southern Fertilizer Company.....	Louisville, Ky.
Swift & Co.....	National Stock Yards, Chicago, Ill.
Tennessee Chemical Company.....	Louisville, Ky.
Tuscarora Fertilizer Company.....	Nashville, Tenn.
Virginia-Carolina Chemical Company.....	Cincinnati, O.
The Wing Seed Company.....	Mechanicsburg, O.
Robins Jones Company.....	Nashville, Tenn.

KENTUCKY SCHOOLS HAVING AGRICULTURAL COURSES.

County.	Name of School.	Principal.
Adair.....	Columbia Graded & High School.....	W. M. Wilson
Anderson.....	Anderson County High School.....	Mrs. C. W. Kavanaugh
Ballard.....	Wickliffe Graded School.....	H. E. Karr
Ballard.....	Ballard County High School.....	W. H. Sugg
Ballard.....	Barlow Graded School.....	J. B. Ward
Ballard.....	Bandana High School.....	H. P. Roberts
Ballard.....	Lovelaceville High School.....	Edgar Stephens
Ballard.....	Blandville High School.....	S. D. Gunn
Boone.....	Burlington High School.....	J. H. Caywood
Boyle.....	Bate School (Danville).....	J. W. Bate
Breckinridge.....	Hardinsburg High School.	
Breckinridge.....	Cloverport Graded School.	
Breckinridge.....	Irvington Graded School.	
Bullitt.....	Shepherdsville School.....	J. H. Sanders
Bullitt.....	Lebanon Junction School.....	W. A. Whitlow
Campbell.....	County High School (Alexandria).....	Cynthia E. Reiley
Carroll.....	Carrollton High School.....	J. W. Way
Clinton.....	Albany High School.....	C. E. Smith
Daviess.....	(All schools in this county have course in agriculture)	
Franklin.....	Bridgeport High School.....	M. C. Redwine
Franklin.....	Forks of Elkhorn High School.....	Mrs. C. W. Bell
Franklin.....	Peaks Mill High School.....	B. W. Qualls
Franklin.....	Bald Knob High School.....	A. T. Morgan
Fulton.....	Fulton High School.....	J. C. Cheek
Fulton.....	Jordan Consolidated School.....	F. Irvine
Gallatin.....	Warsaw High School.....	A. L. Ashcraft
Gallatin.....	Glencoe High School.....	Robert Sheriff
Graves.....	Sedalia High School.....	J. S. Brown

County.	Name of School.	Principal.
Graves.....	Water Valley High School.....	L. E. Hurt
Greenup.....	Greenup High School.....	Annie M. Davidson
Greenup.....	South Portsmouth High School.....	T. C. Lantz
Greenup.....	Siloam High School.....	Mrs. Lucy Fitch
Greenup.....	Oldtown High School.....	Agnes Baker
Greenup.....	Letitia High School.....	Maggie Alley
Hancock.....	Beechmont High School (Hawesville).....	Ira L. Arnold
Hancock.....	Lewisport County High School.....	Mrs. Cora Whittinghill
Harrison.....	Berry Graded School.....	L. E. Sharon
Harrison.....	Oddville County High School.....	W. B. Elder
Harrison.....	Cynthiana Graded School.....	R. I. Cord
Harrison.....	Roseview High School.....	John P. Garrard
Hart.....	Horse Cave High School.....	D. D. Donahue
Hart.....	Munfordville High School.....	Edgar Saunders
Henderson.....	Barrett Manual Training High School (Henderson).....	Arkley Wright
Henry.....	Eminence Graded High School.....	J. B. Sibley
Henry.....	New Castle Graded High School.....	L. S. Rhoades
Hickman.....	Clinton County High School.....	H. W. Puckett
Hickman.....	Fulghum High School.....	A. M. Wilson
Hickman.....	Beelerton High School.....	Leslie Brown
Hickman.....	Oakton Graded School.....	Add Tartar
Hickman.....	Spring Hill Graded School.....	Velma Samuel
Hickman.....	Clinton Colored High School.....	U. S. Poston
Hickman.....	Columbus Graded School.....	Irvie Brown
Jackson.....	Blanton Flat School.....	Logan Miller
Jackson.....	Lincoln Hall Academy.....	Isaac Messler
Jackson.....	McKee Academy.....	Rev. Worthington
Lawrence.....	Kentucky Normal College (Louisa).....	W. M. Byington
Logan.....	Olmstead High School.....	W. M. Caudill
Logan.....	Auburn High School.....	J. D. Spears
Logan.....	Lewisburg High School.....	G. P. Smith
Logan.....	Adairville High School.....	E. H. Ellis
Madison.....	Union High School.....	B. M. Williams
Madison.....	Waco High School.....	J. R. Robinson
Madison.....	Kirksville High School.....	Harris B. Akin
Marion.....	Lebanon Graded School.....	J. R. Sterett
Mason.....	Mayslick School.....	E. L. Dix
Mason.....	Minerva School.....	J. A. Caldwell
Mason.....	Dover School.....	C. K. Dameron
Mason.....	Lewisburg School.....	Laura Crosby
Mason.....	Sardis School.....	Howard Orme
Mason.....	Rectorville School.....	Bayard McCann
Mason.....	Orangeburg School.....	C. E. Turnipseed
McCreary.....	Whitley City Graded & High School.....	Homer Kress
McCreary.....	Pine Knot School.....	R. W. Jethra
Mercer.....	Harrodsburg School.....	J. G. Prather
Muhlenberg.....	Greenville Graded School.....	C. C. Hayden
Muhlenberg.....	Central City School.....	J. R. Kirk
Oldham.....	Lagrange Graded School.....	W. L. Dawson
Owen.....	Owenton Graded School.....	B. L. Vallandigham
Owen.....	Gratz School.....	J. D. Hearn
Owen.....	New Liberty School.....	J. N. Witt
Owen.....	Sparta School.....	L. B. Wadsworth
Owen.....	Wheatley School.....	Sue Arnold
Cwsley.....	Booneville School.....	G. E. Hancock
Pendleton.....	Falmouth School.....	G. H. Wells
Pendleton.....	Butler School.....	E. E. Bratcher

County.	Name of School.	Principal.
Powell.....	Stanton College.....	J. C. Hanley
Robertson.....	Mt. Olivet High School.....	A. P. Prather
Rockcastle.....	Mt. Vernon Graded School.....	J. S. Irvine
Rockcastle.....	Livingston Graded School.....	G. J. Wilson
Rockcastle.....	Brodhead School.....	J. L. Pilkenton
Rockcastle.....	Brown Memorial (Mt. Vernon).....	Mrs. A. B. Stewart
Scott.....	Yates School.....	Nell Lucas
Scott.....	Great Crossing School.....	A. M. Shelton
Scott.....	Newtown School.....	E. W. Williams
Shelby.....	Shelbyville School.....	Prof. Hesson
Shelby.....	Simpsonville School.....	H. D. Copeland
Shelby.....	Finchville School.....	I. C. Reubelt
Shelby.....	Waddy School.....	E. J. Paxton
Shelby.....	Bagdad School.....	M. McGowan
Spencer.....	Taylorville Graded School.....	D. J. Wright
Todd.....	Sharon Grove School.....	Mollie Lindsay
Todd.....	Keelings School.....	Lucy Fairly
Todd.....	Pea Ridge School.....	Pearl Miller
Todd.....	Adams School.....	Kathleen Thompson
Todd.....	Kirkmansville School.....	H. G. Watson
Trimble.....	Bedford High School.....	J. H. Payne
Warren.....	Smith's Grove.....	W. P. White

AGRICULTURAL AND LIVE STOCK ASSOCIATIONS OF KENTUCKY.

For the convenience of those interested, we publish below a list of the officers of such of the Agricultural and Live Stock Associations as have been reported to this Department:

KENTUCKY STATE UNION.

(A. S. of E.)

President, R. E. I. Ray.....	Stithton
Vice President, M. W. Carver.....	Greenville
Secretary-Treasurer, S. B. Robertson.....	Calhoun
State Organizer, Robert Garrison.....	Bowling Green

BOARD OF DIRECTORS.

H. M. Pirtle.....	Hartford
W. D. Osborn.....	Meadow
Louis Webb.....	Russellville
W. E. Bibb.....	Sacramento
M. W. Carver.....	Greenville

KENTUCKY STATE GRANGE.

Master, D. N. Lafferty.....	Cynthiana
Lecturer, Mrs. Estella VanDeren.....	Cynthiana
Treasurer, J. W. Conner.....	Union
Secretary, Mrs. Mabel G. Sayre.....	Hebron

EXECUTIVE COMMITTEE.

Ben J. Padack.....	Hebron
G. O. Hafer.....	Burlington
J. W. Snodgrass.....	Cynthiana
L. H. Voshell.....	Union
D. B. Dobbins.....	Richwood

BURLEY TOBACCO COMPANY.

President, Clarence LeBus.....	Lexington
Vice President, A. L. Ferguson.....	Lexington
Secretary, John W. Hall.....	Lexington
Assistant Secretary, Bessie Osborne.....	Lexington

EXECUTIVE COMMITTEEMEN.

Fred Stucy.....	Ghent
U. G. Saunders.....	Lexington
A. L. Ferguson.....	Georgetown
C. H. Berryman.....	Lexington
C. C. Patrick.....	Lexington
S. A. Shanklin.....	Helena Station
Lister Witherspoon.....	Versailles

KENTUCKY CORN GROWERS' ASSOCIATION.

President, R. M. Squires.....	Lexington
Vice President, Chas. Caldwell.....	Danville
Treasurer, A. H. Gilbert.....	Lexington
Secretary, T. R. Bryant.....	Lexington

DISTRICT VICE PRESIDENTS.

First District, S. M. Bradley.....	Morehead
Second District, J. W. Duncan.....	Nicholasville
Third District, W. B. Threlkeld.....	Uniontown

WARREN COUNTY STRAWBERRY GROWERS' ASSOCIATION.

President, A. C. Meador.....	Bowling Green, R. No. 1
Vice President, M. D. Alexander.....	Bowling Green, R. No. 1
Secretary-Treasurer, James M. Elkin.....	Bristow, R. No. 1
Manager, H. D. Graham.....	Bowling Green

DIRECTORS.

R. M. Covington.....	Bowling Green
J. B. Scumpter.....	Bowling Green
Geo. A. Collet.....	Bowling Green
J. B. Graham.....	Bowling Green, R. No. 1

BEEKEEPERS' ASSOCIATION.

President, H. C. Clemons.....	Boyd
Vice President, J. P. Martine.....	Louisville, 206 E. Jefferson
Secretary, H. Garman (Prof.).....	Lexington

KENTUCKY POULTRY ASSOCIATION.

President, Harris Lehman.....	Midway
Secretary, J. Gaylord Blair.....	Louisville
Treasurer, C. C. Loomis.....	St. Matthews

VICE PRESIDENTS.

First Vice President, Geo. E. Schulz.....	Louisville
Second Vice President, J. C. Neff.....	Richmond
Third Vice President, J. T. Milligan.....	Stithton
Fourth Vice President, W. B. Jenkins.....	Glendale
Fifth Vice President, B. D. Hill.....	Hopkinsville
J. W. Newman, Commissioner of Agriculture.....	Frankfort
Dr. Jos. H. Kastle, Director of Experiment Station.....	Lexington

EXECUTIVE COMMITTEE.

First District, W. E. Cochran.....	Paducah
Second District, C. E. Carpenter.....	Owensboro
Third District, R. L. Willmoth.....	Rineyville
Fourth District, Eugene J. Straus.....	Louisville
Fifth District, Mrs. Walter Kenney.....	Paris
Sixth District, W. W. White.....	Newport
Seventh District, R. A. Chiles.....	Mt. Sterling

KENTUCKY BRANCH AMERICAN POULTRY ASSOCIATION.

President, C. C. Loomis.....	St. Matthews
First Vice President, W. B. Buford.....	Nicholasville
Second Vice President, J. J. Hooper.....	Lexington
Secretary, J. Gaylord Blair.....	Louisville
Treasurer, Mrs. Walter Kenny.....	Paris

EXECUTIVE COMMITTEE.

W. E. Johnson.....	Lexington
Mrs. J. R. Gibson.....	Richmond
L. L. Haggin.....	Lexington
John Steers.....	Dry Ridge
Harris Lehman.....	Midway

LIVE STOCK ASSOCIATIONS.

KENTUCKY TROTTING HORSE BREEDERS' ASSOCIATION.

President, Ed. A. Tipton.....	Lexington
Vice President, R. C. Estill.....	Lexington
Vice President, John R. Hagyard.....	Lexington
Treasurer, First and City National Bank.....	Lexington
Secretary, J. W. Williams.....	Lexington

DIRECTORS.

J. D. Grover,	R. C. Stoll,
A. B. Coxe,	John R. Allen,
David M. Look.	

KENTUCKY DAIRY CATTLE CLUB.

President, C. M. Phillips.....	Shelbyville
Vice President, R. D. Collins.....	Lexington
Secretary-Treasurer, J. J. Hooper.....	Lexington

EXECUTIVE COMMITTEE.

J. A. Stanley.....	Shelbyville
Oscar Ewing.....	Louisville
W. D. Nichols.....	Lexington
Z. W. Lee.....	Cynthiana
W. R. Spann.....	Shelbyville

KENTUCKY DUROC JERSEY ASSOCIATION.

President, Alfred Hite.....	Lyndon
Vice President, E. S. Mayes, Jr.....	Springfield
Secretary-Treasurer, James McKee.....	Versailles

EXECUTIVE COMMITTEE.

William Harris.....	Morganfield
Charles Wheeler.....	Buechel
Alfred Hite.....	Lyndon

KENTUCKY STATE BERKSHIRE ASSOCIATION.

President, J. Lewis Letterle.....	Harrods Creek
Vice President, O. F. Troutman.....	Nicholasville
Secretary-Treasurer, G. G. Johnson.....	Georgetown

EXECUTIVE COMMITTEE.

S. S. Ormsby.....	Anchorage
J. W. Case.....	Hutchison
A. P. Shropshire.....	Muir
T. Wilmott.....	Hutchison

KENTUCKY BEEF CATTLE ASSOCIATION.

President, Chas. H. Berryman.....	Lexington
Vice President, Jonas Well.....	Lexington
Secretary-Treasurer, E. S. Good.....	Lexington

EXECUTIVE COMMITTEE.

J. W. Newman.....	Frankfort
J. W. Bales.....	Richmond
Samuel Clay.....	Paris
F. C. Giltner.....	Eminence
Chas. Caldwell.....	Danville
Henry Moxley.....	Shelbyville
Thos. Keith.....	Maysville
John E. Brown.....	Shelbyville
Dwight Pendleton.....	Winchester

KENTUCKY SHEEP BREEDERS' ASSOCIATION.

President, Robert S. Blastock.....	Donerail
Vice President, E. E. Wood.....	Georgetown
Secretary-Treasurer, E. S. Good.....	Lexington
Assistant Secretary-Treasurer, Miss Lillian Headley.....	Lexington

EXECUTIVE COMMITTEE.

James A. McKee.....	Versailles
T. J. Bigstaff.....	Mt. Sterling
R. H. Stevenson.....	Lexington
J. B. Coleman.....	Visalia
B. Macklin.....	Forks of Elkhorn

MISCELLANEOUS ORGANIZATIONS.

THE KENTUCKY GOOD ROADS ASSOCIATION.

(Kentucky Division of the National Highway Association.)

President, Col. Robert J. McBryde, Jr.....	Louisville
First Vice President, Harry A. Sommers.....	Elizabethtown
Second Vice President, Clayton S. Hitchins.....	Hitchins
Secretary, Robert C. Terrell.....	Frankfort
Treasurer, Frank M. Gettys.....	Louisville
State Director, Robert E. Woods.....	Louisville

TRUSTEES.

Col. Robert J. McBryde, Jr.....	Louisville
Robert C. Terrell.....	Frankfort
Frank M. Gettys.....	Louisville
John J. Saunders.....	Louisville
Guthrie Wilson.....	Bardstown
Harry A. Sommers.....	Elizabethtown
Joseph F. Bosworth.....	Middlesboro
Edward McAfee.....	Vanarsdell
Robert B. McGregory.....	Sebree
James N. Farmer.....	Somerset
Claxon S. Hitchins.....	Hitchins
Tevis Carpenter.....	Scottsville
Will Ward Duffield.....	Harlan

COUNSEL,

Pendleton Beckley..... Louisville

DEPOSITORY.

Union National Bank..... Louisville

STATE HORTICULTURAL SOCIETY.

President, Fred Mutchler..... Lexington

Secretary-Treasurer, C. W. Mathews..... Lexington

VICE PRESIDENTS.

Boone County—W. H. Clayton..... Hebron

Fayette County—L. E. Hillenmeyer..... Lexington

Hardin County—Jno. T. Milligan..... Stithton

Henderson County—C. E. Sugg..... Henderson

Jefferson County—F. E. Merriman..... Louisville

Lawrence County—Jay H. Northup..... Louisa

Powell County—Fred R. Blackburn..... Stanton

Rockcastle County—C. D. Smith..... Conway

Rowan County—H. Van Antwerp..... Farmers

Trimble County—Jno. H. Richardson..... Bedford

Warren County—Morgan Hughes..... Bowling Green

Woodford County—Mrs. J. M. Garrett..... Fort Garrett

CREAMERIES IN KENTUCKY.

County	Name of Creamery	Town
Bell	Asher Creamery	Pineville
Boone	Clover Leaf Creamery	Burlington
Boone	Union Creamery	Union
Caldwell	J. E. Crider	Fredonia
Campbell	George B. Mook Creamery	Newport
Christian	Peter Fox's Sons	Hopkinsville
Fayette	Centralia Creamery Co.	Lexington
Fleming	Sugar Loaf Creamery	Flemingsburg
Henderson	Henderson Pure Milk Company	Henderson
Jefferson	National Ice Cream Co.	Louisville
Jefferson	D. H. Ewing & Son	Louisville
Jefferson	American Butter & Cheese Co.	Louisville
Jefferson	E. K. Mack Creamery	Louisville
Jefferson	Carrither's Creamery	Louisville
Jefferson	Dixie Butter Co.	Louisville
Laurel	The London Creamery Co.	London
Lincoln	Stanford Creamery Co.	Stanford
Mason	Crescent Creamery Association	Rectorville
Mason	Dover Creamery Association	Dover
Mason	Model Creamery Co.	Maysville
McCracken	Crystal Creamery Co.	Paducah
Oldham	M. A. Stoess Creamery	Crestwood
Pendleton	Butler Creamery Co.	Butler
Pendleton	H. M. Owen Creamery Co.	Falmouth
Pendleton	Merchants' Ice Cream Co.	Butler
Taylor	Campbellsville Creamery Co.	Campbellsville
Union	Peerless Cream Co.	Morganfield

BULLETINS ISSUED BY THE DEPARTMENT OF
AGRICULTURE, FRANKFORT, KENTUCKY.

1. Rules for Corn, Potato and Tomato Clubs, 1912.
2. Home Economics Club.
3. Industrial Kentucky.
4. Labor Laws, 1912.
5. Rules for Corn, Potato, Tomato and Poultry Clubs 1913.
6. Use of Ground Limestone.
7. Poultry Raising in Kentucky.
8. Hog Cholera and Its Control.
9. Boys' Corn Clubs in Kentucky, 1912.
10. Catarrhal Fever in Horses.
11. Feeding and Care of Babies.
12. Labor Laws, 1914.
13. Directory of Breeders of Pure Bred Livestock.
14. Laws Governing State Live Stock Sanitary Board of Kentucky.
15. Workmen's Compensation Law.
16. Suggested Outlines for Study of Home Economics.
Rules and Regulations State Live Stock Sanitary Board of
Kentucky.
Horticultural Society Reports.
State Farmers' Institute Reports.

LIST OF LOOSE LEAF TOBACCO WAREHOUSES
IN KENTUCKY, REPORTING MONTHLY TO
THE DEPARTMENT OF AGRICULTURE,
FRANKFORT, KENTUCKY.

Burley Tobacco Co.....	Augusta
Farmers Loose Leaf Tobacco Warehouse Co.....	Augusta
Planters Loose Leaf Tobacco Warehouse Co.....	Augusta
Farmers Loose Leaf Tobacco Warehouse Co.....	Bloomfield
Farmers Tobacco Warehouse Co.....	Bowling Green
Independent Loose Leaf Tobacco Warehouse Co.....	Bowling Green
Warren Co. Loose Leaf Tobacco Warehouse Co.....	Bowling Green
Burley Tobacco Co.....	Brooksville
Burley Tobacco Co.....	Carlisle
Farmers Loose Leaf Tobacco Warehouse Co.....	Carlisle
Peoples Loose Leaf Tobacco Warehouse Co.....	Carlisle
Burley Tobacco Co.....	Carrollton
Carrollton Tobacco Warehouse Co.....	Carrollton
The Wood Tobacco Warehouse Co.....	Carrollton
Burley Tobacco Warehouse Co.....	Cynthiana
Cynthiana Tobacco Warehouse Co.....	Cynthiana
Farmers Tobacco Warehouse Co.....	Cynthiana
Peoples Tobacco Warehouse Co.....	Danville
Burley Tobacco Warehouse Co.....	Dry Ridge
Burley Tobacco Co.....	Eminence
Farmers Loose Leaf Tobacco Warehouse Co.....	Eminence

Growers Tobacco Co.....	Eminence
Burley Tobacco Co.....	Falmouth
Falmouth Loose Leaf Tobacco Warehouse Co.....	Falmouth
Burley Tobacco Co.....	Flemingsburg
Growers Tobacco Warehouse Co.....	Flemingsburg
Fordsville Loose Leaf Tobacco Warehouse Co.....	Fordsville
Burley Tobacco Co.....	Frankfort
Franklin Tobacco Co.....	Frankfort
Growers Tobacco Warehouse Co.....	Frankfort
Simpson County Loose Leaf Tobacco Warehouse Co.....	Franklin
Farmers Tobacco Warehouse Co.....	Glasgow
Planters Loose Leaf Tobacco Warehouse Co.....	Glasgow
Glencoe Tobacco Warehouse Co.....	Glencoe
Glen Dean Loose Leaf Tobacco Warehouse Co.....	Glen Dean
Greensburg Loose Leaf Tobacco Warehouse Co.....	Greensburg
Breckinridge Loose Leaf Tobacco Warehouse Co.....	Hardinsburg
Farmers Loose Leaf Tobacco Warehouse Co.....	Harrodsburg
Mercer Loose Leaf Tobacco Warehouse Co.....	Harrodsburg
Butler & Jackson.....	Hopkinsville
R. E. Cooper & Co.....	Hopkinsville
R. E. & W. D. Cooper.....	Hopkinsville
Hancock Warehouse Co.....	Hopkinsville
Peoples House.....	Hopkinsville
M. H. Tandy & Co.....	Hopkinsville
Thompson Loose Leaf Floor.....	Hopkinsville
J. P. Thompson & Co.....	Hopkinsville
Burley Tobacco Co.....	Horse Cave
Peoples Loose Leaf Tobacco Warehouse Co.....	Horse Cave
Marion County Tobacco Warehouse Co.....	Lebanon
Burley Tobacco Co. (812 S. Broadway).....	Lexington
Fayette Tobacco Warehouse Co.....	Lexington
Farmers Home Tobacco Warehouse Co.....	Lexington
Growers Tobacco Warehouse Co.....	Lexington
Independent Tobacco Warehouse Co.....	Lexington
Headley Tobacco Warehouse Co.....	Lexington
Lexington Tobacco Warehouse Co.....	Lexington
Peoples Tobacco Warehouse Co.....	Lexington
The New Silas Shelburne Warehouse Co.....	Lexington
Jefferson Tobacco Warehouse Co.....	Louisville
Louisville Tobacco Warehouse Co.....	Louisville
Main Street Tobacco Warehouse Co.....	Louisville
Pickett Warehouse (Bridges & Co.).....	Louisville
Tenth Street Tobacco Warehouse Co.....	Louisville
Turner Tobacco Warehouse Co.....	Louisville
T. M. Ballard & Co.....	Mayfield
Lewis Tobacco Warehouse Co.....	Mayfield
Ligon Brps.....	Mayfield
Amazon Warehouse Co.....	Maysville
Central Warehouse Co.....	Maysville
Farmers & Planters Warehouse Co.....	Maysville
Farmers Tobacco Warehouse Co.....	Maysville
Growers Warehouse Co.....	Maysville
Home Warehouse Co.....	Maysville
Independent Loose Leaf Tobacco Co.....	Maysville
Maysville Tobacco Society.....	Maysville
Burley Tobacco Co.....	Mt. Sterling
Farmers Tobacco Warehouse Co.....	Mt. Sterling
A. R. Robertson.....	Mt. Sterling
Whitehall Loose Leaf Tobacco Warehouse Co.....	Mt. Sterling

Equity Home Warehouse Co.....	Owensboro
Green River Tobacco Growers Assn.....	Owensboro
Lancaster Loose Leaf Tobacco Co.....	Owensboro
Owensboro Tobacco Warehouse Co.....	Owensboro
Burley Tobacco Co.....	Owenton
Bourbon Tobacco Warehouse Co.....	Paris
Paris Tobacco Warehouse Co.....	Paris
Burley Tobacco Co.....	Pleasureville
Home Loose Leaf Tobacco Warehouse Co.....	Richmond
Madison Tobacco Warehouse Co.....	Richmond
Farmers Loose Leaf Tobacco Warehouse Co.....	Shelbyville
Globe Tobacco Warehouse Co.....	Shelbyville
Shelby Loose Leaf Warehouse Co.....	Shelbyville
Farmers Warehouse Co.....	Springfield
Springfield Loose Leaf Tobacco Warehouse Co.....	Springfield
Washington County Warehouse.....	Springfield
Vanceburg Loose Leaf Tobacco Warehouse Co.....	Vanceburg
Citizens Loose Leaf Tobacco Warehouse Co.....	Vine Grove
Burley Tobacco Co.....	Williamstown
Planters Loose Leaf Tobacco Warehouse Co.....	Winchester
R. A. Scobee Loose Leaf Tobacco Warehouse Co.....	Winchester
Winchester Tobacco Warehouse Co.....	Winchester

COMMISSIONERS OF AGRICULTURE
1876—1916.

1876—1880	Winston J. Davis.....	Christian County
1880—1884	C. F. Bowman.....	Boyle County
1884—1888	Jno. F. Davis.....	Shelby County
1888—1892	C. Y. Wilson.....	Barren County
1892—1896	Nicholas McDowell.....	Boyle County
1896—1900	Lucas Moore.....	Washington County
1900—2 months	J. W. Throckmorton.....	Fayette County
1900—1904	I. B. Nall.....	Jefferson County
1904—1908	Hubert Vreeland.....	Jefferson County
1908—1912	M. C. Rankin.....	Henry County
1912—1916	J. W. Newman.....	Woodford County
1916—1920	Mat S. Cohen.....	Fayette County

LIVE STOCK STATISTICS FOR KENTUCKY BY COUNTIES.
The following Statistics are taken from United States Government Census of 1910.

COUNTY	CATTLE		HORSES		MULES		Jack Stock		SWINE		SHEEP		POULTRY	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Adair	7,824	\$162,482	4,420	\$391,327	2,263	\$241,519	36	\$5,515	12,640	\$56,765	6,729	\$21,397	72,069	\$36,773
Allen	8,001	165,341	3,101	303,455	3,384	392,336	63	5,057	13,505	70,811	7,433	23,861	84,418	39,010
Anderson	6,431	197,236	3,635	330,924	559	53,796	33	7,020	6,635	43,626	24,938	108,427	58,849	32,977
Ballard	5,321	127,105	4,179	456,787	2,966	377,878	11	5,260	23,364	144,212	1,597	6,046	60,823	28,374
Barren	12,863	317,997	5,861	601,533	5,058	648,388	92	14,113	14,763	103,593	12,684	44,731	124,617	69,238
Bath	10,585	339,554	4,533	464,297	2,096	243,067	42	9,850	10,321	38,158	12,790	56,086	92,775	53,046
Bell	4,831	98,759	655	61,924	723	86,608	5	450	6,449	23,612	2,439	6,174	25,132	11,173
Boone	9,429	286,455	4,044	387,551	602	73,810	8	1,900	16,670	121,002	29,053	141,203	83,251	50,406
Bourbon	17,533	726,906	6,357	736,634	2,117	272,651	58	12,720	24,861	199,337	60,195	268,063	92,025	56,545
Boyd	7,631	188,049	1,241	119,800	211	23,650	1	200	2,706	21,323	2,663	9,694	30,434	15,074
Boyle	7,960	292,397	2,094	311,663	1,459	170,495	137	27,765	11,079	85,578	15,337	72,207	53,762	36,751
Bracken	6,045	186,172	4,275	418,754	161	15,870	8	1,645	6,207	47,652	3,358	13,441	74,555	40,157
Breathitt	9,161	205,697	1,339	126,301	1,040	126,613	11	1,260	14,354	61,357	5,900	18,318	56,275	19,251
Breckinridge	10,259	224,559	5,615	515,497	3,391	382,364	30	7,240	17,364	109,473	18,546	70,846	110,770	56,827
Bullitt	5,362	130,324	3,022	254,178	1,182	124,405	19	2,575	9,994	64,446	5,731	20,560	52,700	27,546
Butler	7,560	154,904	3,498	309,467	3,094	341,876	38	5,615	13,205	63,399	7,367	21,262	86,335	41,238
Caldwell	7,589	156,956	3,123	321,954	2,616	291,965	63	4,060	11,671	62,605	5,097	18,170	54,196	25,845
Calloway	8,064	176,653	5,720	598,359	3,899	449,613	56	8,100	15,511	71,893	4,336	13,365	100,343	45,472
Campbell	7,646	254,552	3,666	414,321	245	28,007	3	1,000	5,224	37,686	3,951	19,664	79,133	46,841
Carlisle	4,480	97,811	3,791	393,637	1,805	208,924	42	4,940	16,560	87,665	4,331	17,714	52,928	25,555
Carroll	4,308	132,497	2,701	274,320	625	72,141	25	2,970	5,927	43,592	9,009	45,263	51,519	32,431
Carter	11,492	274,621	3,402	323,285	1,460	169,735	38	6,658	6,643	47,164	2,801	9,152	78,795	37,828
Casey	7,175	158,763	3,661	328,934	1,808	206,621	35	5,460	9,166	45,546	11,354	43,448	70,662	36,317
Christian	11,596	272,114	5,016	539,083	6,617	814,435	63	11,120	29,087	155,939	7,862	29,316	107,696	48,071
Clark	16,443	560,118	4,295	423,466	2,055	264,681	49	11,525	16,046	124,826	26,893	170,078	90,025	55,940
Clay	9,891	198,511	1,480	134,272	1,748	211,326	10	1,456	13,902	57,058	7,288	21,989	62,737	26,183
Clinton	4,087	77,074	1,419	122,717	1,094	126,325	39	4,528	6,112	23,035	2,853	6,826	33,199	15,714
Crittenden	8,224	169,385	4,249	398,816	2,608	284,520	57	9,020	16,506	85,394	7,955	28,098	68,434	32,506
Cumberland	4,830	98,094	1,985	154,922	1,430	143,893	31	1,991	9,083	36,260	3,775	9,100	40,924	19,044

LIVE STOCK STATISTICS FOR KENTUCKY BY COUNTIES—Continued.
The following Statistics are taken from United States Government Census of 1910.

COUNTY	CATTLE		HORSES		MULES		Jack Stock		SWINE		SHEEP		POULTRY	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Daviess	10,206	251,711	8,431	826,674	4,010	468,763	36	7,320	18,642	122,413	7,265	27,470	139,230	69,878
Edmonson	5,899	125,966	2,258	211,332	1,151	130,450	27	2,925	6,822	33,424	4,736	14,688	48,566	23,376
Elliott	6,493	167,603	1,826	166,425	769	95,310	20	1,645	5,145	35,734	2,708	8,254	51,020	22,741
Estill	6,441	160,659	2,105	184,697	1,013	120,859	20	3,212	8,026	52,977	2,414	8,426	57,862	26,862
Fayette	14,490	634,310	8,638	2,351,278	2,735	381,316	109	16,640	18,434	157,391	25,547	137,413	98,476	61,540
Fleming	12,526	382,956	7,255	715,667	1,214	132,459	174	29,218	17,200	134,849	18,446	78,289	132,127	76,932
Floyd	10,707	223,964	2,086	185,048	1,154	139,825	7	2,350	17,950	72,266	5,642	13,242	71,845	29,816
Franklin	7,558	232,782	4,240	420,707	1,004	120,342	13	4,375	8,982	66,057	15,198	68,444	62,174	32,754
Fulton	5,206	104,976	2,413	293,131	2,421	318,762	12	2,100	15,897	95,116	6,852	26,806	42,391	22,181
Gallatin	2,519	77,767	1,760	155,332	482	57,982	1	500	4,165	27,608	7,422	30,473	28,073	15,887
Garrard	9,537	266,250	4,398	439,043	1,793	220,620	34	8,025	13,341	101,091	15,557	63,847	94,717	49,597
Grant	8,131	244,183	4,819	475,793	638	64,014	17	3,280	11,173	69,828	30,725	147,128	80,002	47,676
Graves	12,763	303,245	9,851	1,051,222	6,064	686,976	78	12,555	24,748	154,999	8,020	30,382	150,527	75,607
Grayson	11,468	237,238	5,841	501,577	2,746	288,577	33	6,501	17,854	95,886	15,766	49,602	123,909	65,889
Green	6,598	145,062	2,997	266,970	2,753	304,771	30	8,365	7,651	49,374	4,938	16,223	59,853	33,633
Greene	8,300	198,035	2,301	220,162	1,383	165,335	13	1,185	4,509	34,139	955	2,998	65,732	31,021
Hancock	3,895	95,606	2,598	259,910	1,021	120,500	4	1,025	5,857	37,138	3,543	13,082	50,707	25,583
Hardin	16,106	369,175	7,761	688,644	2,933	323,021	65	12,315	26,993	176,043	27,524	101,619	145,012	75,138
Harlan	5,188	97,825	688	61,360	807	104,612	5	345	8,205	26,484	4,381	10,915	32,675	11,507
Harrison	12,026	380,324	7,246	689,314	1,815	120,192	67	19,180	19,002	124,530	53,050	236,084	129,034	80,669
Hart	10,463	247,792	4,586	435,744	2,825	332,163	39	7,587	10,625	65,731	10,164	34,521	96,715	51,113
Henderson	8,760	209,578	5,452	602,775	4,904	606,834	28	4,850	26,292	147,422	4,673	15,282	101,932	47,081
Henry	6,478	278,715	5,667	534,108	1,333	164,129	16	5,750	14,003	96,039	17,486	83,114	88,949	46,371
Hickman	6,066	134,563	3,727	404,519	2,870	364,833	34	3,160	21,754	141,610	8,578	37,409	63,720	32,890
Hopkins	10,699	217,864	5,693	562,132	4,415	492,174	74	9,035	18,776	89,401	7,010	23,077	88,968	45,604
Hopkins	6,205	135,795	1,672	152,796	1,214	151,905	9	1,240	5,828	31,702	6,348	19,407	42,392	17,375
Jefferson	11,129	369,200	7,062	793,461	2,748	334,880	33	4,491	13,700	100,861	7,411	35,764	115,867	67,144
Jessamine	6,593	205,408	3,483	358,402	1,432	176,488	17	5,600	12,199	79,127	15,808	75,114	59,804	33,132

Johnson	8,539	207,173	1,917	176,141	1,169	143,313	34	4,635	7,846	47,190	3,435	9,883	61,015	29,676
Kenton	6,787	225,940	3,137	315,298	270	27,116	5	3,200	5,201	36,667	12,253	58,221	69,491	40,898
Knott	6,535	128,792	834	75,625	781	97,682	8	4,325	12,594	39,776	5,312	11,130	61,820	12,078
Knox	9,614	172,074	1,787	149,814	1,958	224,000	42	6,135	9,135	38,447	4,020	9,254	66,072	26,247
Larue	6,389	157,614	3,670	342,205	1,634	193,232	41	9,100	10,004	67,689	8,690	33,811	59,659	33,398
Laurel	9,853	196,115	2,505	227,107	1,568	178,749	12	1,330	7,865	38,592	6,798	18,453	59,167	24,538
Lawrence	16,457	363,037	3,134	288,337	962	112,252	16	2,260	9,039	61,739	5,912	17,859	99,232	41,917
Lee	3,536	82,338	931	85,787	434	49,393	10	420	4,270	22,939	1,802	5,101	27,408	10,489
Leslie	5,140	104,854	555	50,767	611	71,672	1	125	8,364	25,340	3,530	8,285	22,821	7,139
Letcher	6,243	109,037	933	81,430	1,069	129,966	3	500	10,199	27,434	4,823	10,704	43,772	12,339
Lewis	7,716	225,683	3,737	372,569	724	77,490	13	2,965	5,187	44,457	3,241	13,084	85,020	42,575
Lincoln	12,774	352,096	5,722	483,977	2,126	237,122	110	23,595	11,632	76,700	22,356	94,609	89,404	44,406
Livingston	8,406	174,063	3,491	337,636	2,591	289,708	25	3,360	17,590	101,709	7,573	25,628	70,782	33,094
Logan	11,240	261,769	6,028	619,957	5,686	666,506	107	16,375	21,517	121,834	13,007	53,377	112,638	57,157
Lyon	5,517	102,105	1,658	154,049	1,742	184,594	16	2,500	9,964	47,387	1,741	5,272	39,665	17,207
McCracken	5,742	158,085	4,286	467,559	2,263	267,784	58	7,110	10,355	66,430	1,773	6,817	70,848	34,920
McLean	5,397	116,685	4,055	405,552	1,697	200,973	16	2,132	12,526	74,330	4,760	17,025	58,817	30,163
Madison	25,143	718,215	7,949	743,141	2,843	332,716	115	21,370	22,051	168,854	18,681	75,203	169,280	89,199
Magoffin	8,016	181,654	1,730	157,979	1,486	176,715	14	1,330	9,339	43,680	4,198	11,397	52,698	24,366
Marion	8,912	247,956	5,399	550,217	2,426	266,340	184	46,755	13,876	99,826	19,077	77,947	73,080	40,997
Marshall	6,803	150,357	4,262	412,249	2,982	322,732	23	4,210	15,606	73,615	4,490	12,788	96,003	39,465
Martin	3,480	71,561	436	37,490	321	35,967	1	500	3,616	16,780	1,132	2,436	17,292	5,437
Mason	10,854	365,970	5,465	635,400	689	78,936	11	2,700	22,818	151,427	17,005	72,596	118,918	59,452
Meade	5,476	123,024	3,591	310,503	1,257	300,728	39	7,965	11,266	66,699	12,614	48,780	74,574	37,376
Menifee	2,957	73,449	1,075	99,408	349	39,700	8	620	2,934	23,957	1,832	6,491	23,459	11,182
Mercer	9,018	268,796	5,335	570,148	1,421	164,555	33	9,325	18,659	123,378	39,598	172,554	92,869	61,564
Metcalfe	5,042	113,596	2,495	227,167	2,072	243,339	32	4,800	6,067	31,119	5,126	16,476	52,738	26,869
Monroe	5,828	125,303	2,564	222,290	2,306	266,503	74	4,990	11,868	53,313	4,829	13,988	64,185	32,287
Montgomery	13,541	487,753	3,916	419,973	1,158	154,911	65	16,000	10,537	96,096	14,970	62,056	65,010	38,963
Morgan	8,960	220,529	2,637	248,453	1,392	172,545	15	2,580	7,453	47,166	5,099	16,288	67,370	26,899
Muhlenberg	11,689	317,162	5,557	473,667	1,908	209,495	40	16,405	13,555	119,856	6,025	19,812	71,175	36,906
Nelson	7,371	239,205	4,864	511,061	654	63,519	84	28,705	11,019	83,959	36,518	173,754	95,421	57,891
Nicholas	10,485	225,278	7,188	636,775	3,121	337,419	27	3,575	13,778	83,204	11,867	38,666	115,793	61,283
Ohio	5,681	166,862	2,460	249,205	1,156	141,445	14	6,125	9,188	72,481	17,455	73,556	44,403	29,469
Oldham	8,349	237,226	6,525	642,603	1,130	128,788	44	10,971	9,153	63,432	35,070	155,821	89,351	49,757
Owen	4,393	95,086	1,021	95,967	779	99,195	9	1,550	5,256	24,898	3,251	9,791	30,678	10,939
Pendleton	10,001	283,682	5,457	537,796	285	23,475	28	7,063	9,362	62,043	18,917	86,540	100,546	56,894

LIVE STOCK STATISTICS FOR KENTUCKY BY COUNTIES—Continued.
The following Statistics are taken from United States Government Census of 1910.

COUNTY	CATTLE		HORSES		MULES		Jack Stock		SWINE		SHEEP		POULTRY	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
	Perry	5,941	125,031	646	55,795	746	90,125	3	450	11,625	34,660	4,495	10,108	34,459	10,479
Pike	15,541	283,183	1,957	171,994	1,894	229,361	9	1,451	25,173	93,933	8,619	19,275	111,786	42,079
Powell	3,566	85,810	1,134	99,610	353	40,420	14	1,760	4,812	27,413	1,172	4,111	25,733	11,633
Pulaski	14,985	301,128	5,300	460,137	3,373	370,952	81	11,800	14,194	70,812	15,919	48,917	148,601	74,565
Robertson	3,345	102,043	2,121	223,875	102	8,077	4	2,000	2,393	23,042	11,686	58,765	47,148	25,187
Rockcastle	6,041	185,949	2,403	224,912	1,108	120,416	14	2,925	6,429	37,054	4,597	17,087	60,542	28,400
Rowan	3,443	93,455	960	86,195	589	69,615	9	1,100	2,705	20,261	1,401	4,694	27,172	13,660
Russell	4,227	88,111	2,461	201,935	1,398	155,649	49	5,891	8,091	31,091	4,590	11,496	51,995	26,608
Scott	11,694	396,798	5,779	581,104	1,649	189,625	72	20,260	19,090	132,688	52,491	246,312	96,863	54,887
Shelby	16,501	694,732	6,823	655,788	2,332	302,117	69	16,021	24,335	173,444	34,078	159,141	112,301	65,670
Simpson	5,910	141,001	3,283	371,335	2,690	338,596	57	12,175	11,176	71,647	6,344	27,677	61,667	31,786
Spencer	7,108	192,106	3,424	317,395	951	111,933	24	6,200	9,353	62,808	17,750	79,391	64,554	36,307
Taylor	5,474	121,913	3,482	326,023	1,685	183,147	40	6,340	7,463	43,421	3,576	13,273	53,921	29,811
Todd	6,616	153,261	2,850	392,709	4,292	517,896	42	4,672	15,453	88,049	5,350	22,402	58,073	29,424
Trigg	7,535	141,127	2,749	265,280	3,661	387,527	55	7,915	16,242	75,026	7,022	21,868	66,878	26,953
Trimble	3,570	95,016	3,126	272,475	4,982	53,450	14	5,150	3,761	26,208	3,992	17,663	51,742	29,751
Union	11,139	290,277	5,026	528,634	4,093	552,358	20	2,300	36,095	290,438	4,505	17,533	76,746	42,915
Warren	14,102	348,693	6,220	629,010	5,099	663,236	112	16,115	25,398	171,333	15,131	61,481	130,925	71,564
Washington	10,324	286,858	6,628	666,804	1,795	193,933	32	19,205	14,990	102,893	37,098	159,234	117,560	60,057
Wayne	10,037	202,032	2,890	253,694	2,153	253,694	23	3,450	14,270	57,907	10,701	28,086	73,330	34,220
Webster	6,267	146,700	5,007	503,622	2,446	284,173	269	35,705	17,975	102,666	4,533	15,718	45,973	35,973
Whitley	12,130	211,609	1,887	154,276	2,355	259,151	33	2,665	10,377	38,291	7,023	15,082	71,566	27,507
Wolfe	5,301	123,505	1,486	138,149	659	83,863	7	1,290	5,663	34,823	4,140	13,347	36,169	12,752
Woodford	6,468	251,775	3,866	432,655	1,534	230,733	14	6,510	13,547	102,732	20,326	101,773	52,315	29,657

CROP STATISTICS FOR KENTUCKY BY COUNTIES.
The following Statistics are taken from United States Government Census of 1910.

COUNTY	CORN		OATS		WHEAT		HAY		POTATOES		TOBACCO	
	Acres	Bushels	Acres	Bushels	Acres	Bushels	Acres	Tons	Acres	Bushels	Acres	Pounds
Adair	37, 319	689, 512	1, 478	19, 374	7, 897	70, 119	8, 893	6, 879	378	31, 878	2, 274	1, 872, 505
Allen	34, 899	733, 137	6, 038	64, 206	2, 541	22, 352	9, 824	7, 546	117	12, 931	4, 520	3, 109, 301
Anderson	13, 156	375, 923	1, 374	17, 884	3, 450	31, 080	7, 265	6, 479	130	12, 520	3, 036	2, 296, 879
Ballard	37, 327	1, 083, 806	492	8, 247	10, 166	148, 932	6, 793	7, 672	44	3, 476	6, 675	5, 547, 967
Barren	53, 439	1, 132, 820	6, 113	74, 795	9, 118	89, 635	15, 497	13, 260	282	24, 243	10, 746	8, 652, 046
Bath	23, 246	727, 445	1, 096	15, 120	3, 056	33, 248	5, 456	6, 102	193	16, 333	5, 562	5, 557, 379
Bell	11, 734	190, 788	307	1, 953	7	53	1, 631	2, 067	554	37, 904	16	3, 102
Boone	16, 995	638, 987	1, 310	32, 181	2, 891	33, 031	13, 880	14, 037	776	76, 719	3, 304	3, 537, 996
Bourbon	29, 550	1, 202, 542	820	19, 840	13, 523	189, 463	11, 167	12, 578	215	28, 549	7, 390	9, 079, 904
Boyd	9, 521	237, 776	925	13, 950	694	6, 948	2, 334	2, 383	418	37, 973	67	45, 155
Boyle	16, 987	768, 734	706	12, 006	11, 986	196, 942	7, 359	8, 686	240	28, 141	1, 474	1, 590, 668
Bracken	12, 378	397, 540	389	7, 142	1, 989	18, 758	7, 904	8, 662	356	34, 118	6, 681	6, 485, 420
Breathitt	28, 547	527, 960	656	4, 456	5	70	1, 801	1, 491	832	50, 323	57	15, 758
Breckinridge	54, 262	1, 048, 235	2, 308	26, 924	11, 881	117, 073	9, 913	8, 227	377	27, 216	9, 687	7, 820, 731
Bullitt	21, 264	566, 932	1, 213	15, 816	3, 032	34, 836	8, 021	8, 296	312	29, 557	845	660, 531
Butler	43, 553	607, 823	1, 778	17, 205	1, 527	12, 779	8, 381	7, 308	353	25, 247	2, 615	1, 715, 709
Caldwell	29, 996	622, 666	191	2, 920	4, 654	59, 194	6, 995	7, 953	135	10, 292	5, 014	3, 690, 656
Calloway	45, 955	969, 256	553	7, 406	3, 072	34, 821	12, 999	10, 694	148	17, 844	10, 268	7, 140, 705
Campbell	9, 774	265, 032	3, 009	66, 957	2, 294	27, 879	12, 592	19, 627	1, 818	155, 095	931	827, 907
Carlisle	25, 175	717, 165	363	5, 706	9, 077	119, 284	8, 298	8, 556	108	4, 346	2, 159	1, 618, 333
Carroll	9, 894	316, 805	609	12, 476	1, 210	12, 860	4, 633	6, 029	191	13, 089	3, 872	3, 557, 922
Carter	30, 884	657, 738	1, 943	20, 795	1, 024	9, 103	5, 813	5, 613	641	50, 849	5, 495	3, 724, 857
Casey	28, 843	647, 783	998	15, 273	4, 243	31, 802	6, 902	5, 784	488	39, 328	2, 042	1, 724, 023
Christian	64, 104	1, 570, 784	1, 500	24, 208	46, 900	732, 692	18, 152	20, 307	214	18, 634	19, 271	14, 129, 592
Clark	20, 597	842, 710	617	9, 655	5, 384	76, 698	5, 441	5, 978	269	28, 596	4, 418	5, 152, 813
Clay	33, 983	633, 315	860	5, 513	231	1, 206	6, 230	4, 108	740	66, 384	132	98, 138
Clinton	19, 357	295, 129	697	6, 669	4, 009	35, 146	4, 874	5, 253	187	21, 466	13	10, 970
Crittenden	45, 780	986, 682	309	4, 332	1, 520	19, 296	10, 862	10, 083	298	18, 801	9, 044	2, 903, 924

CROP STATISTICS FOR KENTUCKY BY COUNTIES—Continued.
The following Statistics are taken from United States Government Census of 1910.

COUNTY	CORN		OATS		WHEAT		HAY		POTATOES		TOBACCO	
	Acres	Bushels	Acres	Bushels	Acres	Bushels	Acres	Tons	Acres	Bushels	Acres	Pounds
Cumberland	23,251	500,734	536	3,372	1,375	10,216	2,796	3,162	121	12,750	642	533,199
Daviess	59,762	1,694,399	955	16,735	14,572	262,024	18,523	20,737	627	43,267	18,910	16,322,970
Edmondson	20,917	403,469	1,186	10,871	1,217	9,248	4,328	4,470	286	23,080	991	550,512
Elliot	24,264	398,586	1,722	16,686	1,198	7,846	3,639	3,089	373	31,096	1,000	68,316
Estill	21,533	548,558	515	5,937	63	387	3,495	3,194	246	24,832	295	234,099
Fayette	28,480	1,227,357	1,324	30,894	19,041	302,097	12,090	14,231	1,230	136,072	5,690	7,155,087
Fleming	30,013	1,017,485	1,542	25,855	7,440	91,063	13,451	13,346	438	44,116	7,394	7,573,662
Floyd	29,582	626,669	374	2,654			3,245	2,311	934	61,163	51	23,200
Franklin	17,021	512,012	1,415	21,985	3,467	31,346	8,258	8,681	427	46,746	5,191	4,247,008
Fulton	26,987	890,103	766	14,920	11,296	166,888	4,782	6,353	90	6,316	665	635,643
Gallatin	7,019	233,178	510	8,941	723	6,939	3,754	4,140	148	11,716	2,172	1,970,501
Garrard	24,448	948,368	832	11,345	10,164	124,413	6,380	6,404	84	7,750	3,461	3,563,086
Grant	16,598	621,556	1,551	31,462	1,732	15,903	14,332	16,012	279	27,157	5,668	5,267,329
Graves	70,259	1,716,958	822	11,555	9,686	108,569	19,365	17,918	202	17,591	18,506	13,352,333
Grayson	56,076	896,213	3,165	31,694	9,100	79,897	9,307	7,141	329	33,938	3,419	2,998,331
Green	28,404	511,445	1,414	13,880	4,849	42,200	6,026	4,570	95	9,329	4,605	3,202,444
Greenup	23,486	489,739	762	10,082	1,192	16,514	4,870	4,766	879	73,399	2,360	1,755,358
Hancock	20,631	516,183	752	11,320	4,691	64,191	5,532	5,372	341	23,046	4,865	4,086,829
Hardin	59,566	1,358,202	3,796	51,371	19,315	216,446	13,532	13,262	514	38,577	2,884	2,167,977
Harlan	14,956	254,148	132	740	42	390	1,447	1,451	351	24,438	25	4,519
Harrison	23,474	911,932	988	13,830	6,666	80,186	13,117	13,689	372	34,372	8,306	8,028,382
Hart	37,441	683,839	1,037	12,659	3,548	30,600	5,085	5,207	181	14,509	8,106	6,273,573
Henderson	72,822	2,073,092	571	9,707	12,538	226,948	11,231	12,754	291	22,828	13,019	10,164,005
Henry	20,166	708,123	2,215	47,664	1,839	15,037	10,766	10,821	156	18,995	8,504	4,392,667
Hickman	35,007	1,091,797	677	11,745	17,559	269,921	10,220	10,822	93	7,824	2,423	7,911,251
Hopkins	52,165	1,035,000	510	10,151	4,683	63,291	17,813	20,277	444	35,859	10,199	7,367,492
Jackson	20,506	325,174	1,898	12,223	175	1,003	5,285	2,497	363	34,383	42	18,983
Jefferson	31,200	947,024	2,277	45,932	9,493	147,835	20,555	23,498	9,255	1,195,631	269	263,200

Jessamine	17, 209	640, 611	1, 429	25, 874	18, 682	285, 630	6, 756	7, 004	308	30, 431	3, 362	5, 659, 694
Johnson	25, 195	466, 214	1, 468	9, 721	36	153	4, 292	4, 150	632	48, 782	28	18, 254
Kenton	9, 445	303, 126	1, 116	26, 844	413	4, 951	10, 487	13, 180	1, 218	118, 486	1, 683	1, 636, 639
Knott	18, 325	372, 111	57	422	9	46	738	681	396	31, 686	27	12, 071
Knox	29, 909	476, 677	988	5, 712	31	250	6, 946	5, 390	801	56, 757	34	20, 370
Larue	26, 513	550, 633	22, 522	31, 258	11, 558	122, 564	4, 924	4, 434	297	24, 125	1, 795	1, 375, 684
Laurel	27, 262	510, 316	2, 411	17, 923	1, 092	6, 878	14, 110	8, 976	941	76, 325	137	79, 427
Lawrence	37, 257	735, 391	2, 097	18, 608	1, 706	13, 731	4, 332	4, 248	1, 027	83, 702	462	306, 362
Lee	12, 773	259, 005	913	5, 646	96	680	775	683	223	18, 570	33	20, 101
Leslie	15, 633	276, 778	40	333	5	301	242	242	538	35, 860	5	1, 703
Letcher	17, 224	303, 136	144	1, 165	30	191	1, 911	1, 634	386	28, 320	6	3, 851
Lewis	23, 760	519, 433	1, 305	21, 188	1, 025	12, 937	7, 202	6, 490	820	67, 711	5, 949	4, 682, 548
Lincoln	23, 930	924, 978	1, 686	32, 827	9, 716	136, 537	12, 580	14, 434	274	25, 642	2, 927	2, 807, 458
Livingston	40, 180	982, 200	591	9, 658	1, 895	27, 567	9, 003	8, 953	348	20, 721	1, 088	757, 627
Logan	53, 853	1, 188, 216	3, 380	51, 616	24, 514	321, 353	16, 052	14, 988	132	12, 724	11, 927	9, 329, 967
Lyon	21, 708	517, 106	521	6, 792	1, 907	24, 861	3, 649	3, 763	101	7, 227	2, 466	2, 036, 727
McCracken	29, 372	726, 771	340	5, 182	3, 223	39, 158	9, 986	9, 904	249	17, 290	3, 651	2, 734, 146
McLean	30, 184	617, 500	466	6, 819	3, 921	52, 677	9, 856	10, 213	241	15, 552	6, 066	4, 809, 880
Madison	45, 426	1, 539, 385	1, 704	23, 067	6, 652	84, 636	8, 782	9, 168	481	46, 777	5, 068	6, 068, 924
Magoffin	27, 305	479, 316	312	1, 801	81	455	3, 684	2, 893	560	35, 719	27	11, 749
Marion	26, 523	799, 177	4, 348	65, 178	4, 090	48, 464	10, 038	9, 897	293	32, 853	3, 033	3, 071, 025
Marshall	39, 807	866, 230	696	9, 203	3, 388	39, 045	9, 925	9, 369	170	16, 470	7, 123	4, 860, 242
Martin	9, 643	173, 866	64	557	.....	.....	3, 131	944	386	28, 627	21	8, 292
Mason	22, 831	1, 024, 161	201	3, 803	8, 497	122, 620	9, 951	10, 981	334	35, 860	8, 489	8, 778, 129
Meade	24, 953	541, 655	1, 635	18, 055	7, 107	69, 155	5, 773	4, 630	196	15, 054	1, 941	1, 603, 848
Menifee	12, 128	210, 747	952	7, 378	359	2, 205	2, 927	1, 839	262	17, 795	112	82, 487
Mercer	21, 510	786, 737	1, 475	25, 227	17, 152	230, 969	9, 925	10, 150	219	26, 316	2, 761	2, 845, 685
Metcalfe	23, 594	395, 238	2, 170	20, 780	3, 931	29, 469	5, 334	3, 787	114	11, 805	5, 031	2, 703, 739
Monroe	30, 785	543, 206	3, 181	26, 852	5, 754	40, 674	7, 008	5, 989	264	23, 820	1, 273	821, 323
Montgomery	16, 889	585, 634	673	12, 930	1, 110	13, 519	6, 343	6, 840	203	16, 293	4, 187	4, 733, 743
Morgan	32, 780	622, 332	1, 773	15, 204	466	3, 251	7, 324	5, 213	743	52, 443	3, 770	84, 736
Muhtenberg	39, 970	613, 675	633	7, 309	2, 857	29, 688	11, 907	11, 610	322	27, 908	3, 770	2, 814, 997
Neelson	35, 086	1, 096, 037	3, 593	49, 553	10, 064	110, 487	11, 101	11, 492	381	31, 448	2, 094	1, 830, 991
Nicholas	14, 357	557, 546	408	6, 901	3, 278	38, 868	6, 292	6, 775	174	17, 345	5, 002	5, 573, 003
Ohio	55, 373	840, 649	1, 456	15, 479	5, 624	56, 932	16, 246	13, 717	523	40, 312	7, 800	5, 578, 821
Oldham	14, 804	482, 143	2, 269	46, 481	3, 535	44, 285	6, 538	6, 081	290	29, 107	1, 515	1, 216, 170
Owen	21, 590	723, 139	1, 555	27, 625	1, 552	11, 364	11, 039	10, 349	285	28, 412	10, 913	9, 448, 000
Owsley	15, 516	291, 324	1, 246	8, 353	174	1, 147	2, 451	1, 453	250	26, 029	30	20, 378

CROP STATISTICS FOR KENTUCKY BY COUNTIES—Continued.
The following Statistics are taken from United States Government Census of 1910.

COUNTY	CORN		OATS		WHEAT		HAY		POTATOES		TOBACCO	
	Acres	Bushels	Acres	Bushels	Acres	Bushels	Acres	Tons	Acres	Bushels	Acres	Pounds
Pendleton	19,233	588,755	1,523	30,852	3,306	31,240	12,568	16,948	428	44,768	6,489	5,943,519
Perry	19,539	351,471	190	1,190	.....	.....	1,221	836	590	41,517	30	6,120
Pike	43,183	862,681	909	5,693	3	30	5,849	4,346	1,823	114,725	36	24,477
Powell	12,268	259,176	272	24,000	40	370	1,880	2,050	148	13,350	168	107,534
Pulaski	58,060	889,010	5,026	57,072	10,948	92,553	12,352	10,895	1,172	104,843	118	76,842
Robertson	7,083	286,653	85	1,175	1,203	13,120	2,787	2,874	76	7,517	2,951	2,796,264
Rockcastle	24,777	430,176	1,021	9,748	2,618	26,511	4,842	3,615	428	34,442	179	118,593
Rowan	13,350	244,708	862	6,806	133	1,029	2,452	1,607	353	26,823	127	76,419
Russell	27,220	451,408	277	2,521	5,311	43,084	4,636	3,841	227	22,093	127	88,362
Scott	24,202	912,229	1,532	31,188	10,740	124,925	12,161	12,668	453	48,688	8,196	8,841,238
Shelby	31,584	1,133,885	1,840	33,337	12,862	95,346	21,236	25,464	280	31,282	9,035	9,314,692
Simpson	25,957	550,653	4,842	72,781	14,362	186,326	7,029	7,577	95	8,493	4,810	3,828,161
Spencer	15,992	500,924	895	15,080	4,484	35,039	6,880	6,560	186	12,983	4,133	3,487,263
Taylor	25,193	457,181	2,439	34,105	4,419	51,135	8,544	6,793	133	11,720	2,623	1,759,769
Todd	36,563	817,835	1,417	29,353	20,468	304,056	9,532	9,831	101	9,230	9,749	7,185,371
Trigg	36,900	904,672	259	4,396	6,933	82,032	6,105	6,223	149	11,904	7,368	5,478,854
Trimble	11,831	326,148	1,572	34,740	2,791	33,848	3,004	3,278	201	16,056	4,560	4,249,495
Union	69,012	2,306,415	1,910	34,979	25,322	444,799	13,988	16,672	135	9,534	4,437	3,261,055
Warren	61,938	1,381,442	12,166	170,613	8,156	121,023	17,284	16,175	364	31,715	6,599	5,252,497
Washington	23,116	751,900	3,509	55,469	6,809	68,193	10,120	9,338	272	29,199	6,924	6,649,782
Wayne	36,052	548,248	2,214	23,437	5,132	53,200	6,277	6,013	593	49,809	16	12,084
Webster	41,992	959,343	416	6,510	3,908	57,631	9,450	9,382	115	6,123	10,512	7,263,239
Whitley	35,505	474,601	2,333	12,466	138	466	10,696	7,857	1,225	83,560	41	9,097
Wolfe	19,291	351,658	1,349	8,287	275	1,821	4,124	3,133	331	24,189	31	19,772
Woodford	16,359	690,034	838	15,293	20,532	297,448	8,192	8,779	602	62,814	6,193	7,091,394

GOVERNMENT CROP REPORT.

Washington, D. C., December 16.—A summary of estimates of crop production and prices for the State of Kentucky and for the United States, compiled by the Bureau of Crop Estimates (and transmitted through the Weather Bureau), U. S. Department of Agriculture, is as follows:

Crop production in the State this year aggregates in quantity about 19 per cent. more than last year. Prices on December 1 average 12 per cent. lower than a year ago, making total value of crop production, on this basis, about 5 per cent. more than last year. The estimates are based upon those crops whose values in the last complete crop census represented 82 per cent. of the value of all crops.

For the United States production this year aggregates in quantity about 9 per cent. more than last year. Prices December 1 average 1 per cent. lower than a year ago, making total value of crop production on this basis about 8 per cent. more than last year; these estimates are based upon crops whose value in the last complete crop census represented 82 per cent. of the value of all crops grown, and may be regarded as representative of all crops.

Estimates for important crops are given below:

CROPS	KENTUCKY			UNITED STATES	
	Acreage	Production	Price Dec. 1	Production	Price Dec. 1
Corn, bu .....1915	3,800,000	114,000,000	56	3,054,535,000	57.5
.....1914	3,650,000	91,250,000	64	2,672,804,000	64.4
Wheat, bu. ....1915	900,000	9,900,000	105	1,011,505,000	92.0
.....1914	760,000	12,540,000	103	891,017,000	98.6
Oats, bu .....1915	210,000	5,460,000	48	1,540,362,000	36.1
.....1914	175,000	3,675,000	53	1,141,060,000	43.8
Barley, bu. ....1915	6,000	180,000	77	237,009,000	51.7
.....1914	5,000	142,000	77	194,953,000	54.3
Rye, bu. ....1915	24,000	288,000	94	49,190,000	83.9
.....1914	22,000	301,000	95	42,779,000	86.5
Buckwheat, bu. ....1915	.....	.....	.....	15,769,000	78.7
.....1914	.....	.....	.....	16,881,000	76.4
Flaxseed, bu. ....1915	.....	.....	.....	13,845,000	\$1.74
.....1914	.....	.....	.....	13,749,000	\$1.26
Rice, bu. ....1915	.....	.....	.....	28,947,000	90.6
.....1914	.....	.....	.....	23,649,000	92.4
Potatoes, bu. ....1915	51,000	6,426,000	55	359,103,000	61.6
.....1914	50,000	2,250,000	84	409,921,000	48.7
Sweet Potatoes, bu. ....1915	10,000	1,050,000	70	74,295,000	62.0
.....1914	10,000	1,050,000	77	56,574,000	73.0
Hay, tons .....1915	875,000	1,225,000	\$12.50	85,225,000	\$10.70
.....1914	750,000	712,000	\$16.00	70,071,000	\$11.12
Tobacco, lbs. ....1915	440,000	356,400,000	7.8	1,060,537,000	9.1
.....1914	400,000	364,000,000	8.4	1,034,679,000	9.8
Cotton, bales .....1915	.....	.....	.....	11,161,000	11.2*
.....1914	.....	.....	.....	16,135,000	6.8*
Sugar Beets, tons .....1915	.....	.....	.....	6,462,000	5.54
.....1914	.....	.....	.....	5,585,000	5.45

*Per pound.

GOVERNMENT LIVE STOCK REPORT FOR
KENTUCKY.

Washington, D. C., January 18, 1916.—A summary of estimates of numbers and values of live stock on farms and ranges on January 1 for Kentucky and for the United States, compiled by the Bureau of Crop Estimates, and transmitted through the Weather Bureau, U. S. Department of Agriculture, is as follows:

HORSES.

State—Number, 434,000, compared with 443,000 a year ago and 447,000 five years ago. Value per head, \$90, compared with \$95 a year ago and \$108 five years ago.

United States—Number, 21,200,000, compared with 21,195,000 a year ago and 20,277,000 five years ago. Value per head, \$101.60, compared with \$103.33 a year ago and \$111.46 five years ago.

MULES.

State—Number 229,000, compared with 231,000 a year ago and 236,000 five years ago. Value per head \$102, compared with \$106 a year ago and \$122 five years ago.

United States—Number 4,560,000, compared with 4,479,000 a year ago and 4,323,000 five years ago. Value per head, \$113.87, compared with \$112.36 a year ago and \$125.92 five years ago.

MILCH COWS.

State—Number, 406,000, compared with 390,000 a year ago and 406,000 five years ago. Value per head, \$44.80, compared with \$45.50 a year ago and \$36.50 five years ago.

United States—Number, 22,000,000, compared with 21,262,000 a year ago and 20,823,000 five years ago. Value per head, \$53.90, compared with \$55.33 a year ago and \$39.97 five years ago.

OTHER CATTLE.

State—Number, 570,000, compared with 543,000 a year ago and 591,000 five years ago. Value per head \$30.80 compared with \$30.40 a year ago and \$20.90 five years ago.

United States—Number, 39,500,000, compared with 37,067,000 a year ago and 39,679,000 five years ago. Value per head, \$33.49 compared with \$33.38 a year ago and \$20.54 five years ago.

SHEEP.

State—Number, 1,160,000, compared with 1,229,000 a year ago and 1,404,000, five years ago. Value per head, \$4.90, compared with \$4.20 a year ago, and \$4.11 five years ago.

United States—Number, 49,200,000, compared with \$49,956,000 a year ago and 53,633,000 five years ago. Value per head, \$5.17, compared with \$4.50 a year ago and \$3.91 five years ago.

SWINE.

State—Number, 1,710,000, compared with 1,582,000 a year ago and 1,626,000 five years ago. Value per head, \$6.50, compared with \$7.20 a year ago and \$7.20 five years ago.

United States—Number, 68,000,000, compared with 64,618,000 a year ago and 65,620,000 five years ago. Value per head, \$8.40, compared with \$9.87 a year ago and \$9.37 five years ago.

PART FIVE.

**WORK OF THE STATE LIVE STOCK SANITARY
BOARD OF KENTUCKY.**

REPORT OF DR. S. F. MUSSELMAN, STATE VETERINARIAN.

Pursuant to an Act of the General Assembly of the Commonwealth of Kentucky creating the State Live Stock Sanitary Board and defining its duties, which became effective June 16, 1914, I was elected the State Veterinarian, and am the first State Veterinarian whose entire time has been devoted to the control and eradication of contagious and infectious diseases among our live stock. It is also my object to improve the quality and increase the quantity of the live stock of this State. I must say that this has been up-hill work, as I have not had at all times the entire co-operation of the live stock owners, because of the fact that my intentions were misunderstood. The State Live Stock Sanitary Board is to the live stock industry what the State Board of Health is to the people. No records are available, which will show results of contagious diseases in the past, and I can not, therefore, say whether or not the past year has been unusual in this respect. Eliminating our losses caused by foot and mouth disease, I am impressed with what in my opinion is a heavy but preventable loss from outbreaks of other contagious and infectious diseases among our live stock. It is my intention to make known to the public how a great many of these diseases can be prevented, and I am not inclined to believe that there are many live stock owners, who will not take advantage of an opportunity to protect their live stock from attacks of disease, when it is shown how these attacks may be prevented. The rules and regulations adopted by the State Live Stock Sanitary Board of Kentucky will, if complied with, likely prevent the entrance into the State of animals affected with contagious or infectious disease. The railroads have been a very great assistance in this particular work.

INTER-STATE SHIPMENTS OF LIVE STOCK.

As accurate records have only been kept during the last eighteen months, a comparative statement cannot be made, which would show the increase or decrease in the shipments of live stock into and from Kentucky. Kentucky is by nature as well adapted to the raising of live stock as any other State, and we should lead rather than fall to the ninth position. It is a pleasing fact to know that within the last few years quite a number of farmers in Kentucky have made considerable progress in breeding pure-bred live stock. It has been demonstrated conclusively by these gentlemen that this pays better than the grade stock, even if the offspring is fed for marketing purposes. Fortunes have been spent in improving this industry, and quite a few of our breeders have gone to foreign countries for the purpose of securing animals to strengthen blood lines and to increase the value of animals. Official health certificates are required for the shipment of pure-bred live stock into this State from all other States. These certificates are not required when animals are brought into the State for immediate slaughter, or are consigned to the Bourbon Stock Yards at Louisville, where Federal inspection is maintained, because such animals are inspected and certified by Federal officials before leaving the yards. Within the last year shipments of live stock have been made from Kentucky into almost every State in the Union, notwithstanding the fact that a great many States were under Federal quarantine during the epizootic of foot-and-mouth disease. Records of animals moving inter-state for immediate slaughter were kept only during our quarantine, when we were required to issue health certificates on all live stock moving inter-state for any purpose. A great many shippers object to having their animals inspected when shipments are attempted, but each State has its own regulations and the shippers by this time should be acquainted with these regulations, and should for their own safety be glad to have their animals inspected so that they might know the shipment contains only healthy animals. It is to be hoped that in the near future shippers and breeders of live stock will look upon this matter from the viewpoint

of officials in control of live stock sanitation. It is also necessary to have the complete co-operation of the railroads, as infected railway cars frequently transmit contagious and infectious diseases.

A tabulated report of the shipments of live stock into and out of Kentucky, for which we have received health certificates, follows:

ANIMALS SHIPPED INTO KENTUCKY.

CATTLE			Horses	Mules	Jacks	SHEEP		HOGS	
Dairy and Breeding	Stockers and Feeders	Slaughter				Registered	Stock	Registered	Slaughter
2,047	16,333	9,332	3,082	1,914	19	113	15,334	243	1,790

ANIMALS SHIPPED FROM KENTUCKY.

CATTLE			Horses	Mules	Jacks	SHEEP		HOGS	
Dairy and Breeding	Stockers and Feeders	Slaughter				Registered	Stock	Registered	Slaughter
1,684	3,972	9,244	2,813	5,750	131	197	2,281	430	21,258

It is a deplorable fact that the Kentucky dairies have to go out of the State to buy their cows, as the above table shows that 363 more cattle for dairy and breeding purposes were shipped into Kentucky than were shipped out, and I am exceedingly sorry to note that we cannot supply our own feeders, as 16,333 animals were shipped into the State for that purpose, and only 3,972 were shipped from the State. Our records of cattle for slaughter are not complete because of the fact that great numbers of animals were taken from the Bourbon Stock Yards, the only yards in Kentucky having Federal inspection, direct to the packing and slaughtering houses in Jefferson County, Kentucky, for which we have no certificates. Nine thousand three hundred and thirty-two (9,332) cattle were brought into Kentucky for slaughter from other States, while during our quarantine 9,244 were taken from the State. Most of this number were fat cattle, that were shipped out during the winter of 1914-15, when certificates were required for all cattle for any purpose. A great many horses shipped into the State were

for the purpose of reshipping to the European countries engaged in war. Reports show that the mule business in Kentucky is still quite good, and that quite a number of mules are raised in this State. To prove this, only 19 jacks and jennets were shipped into Kentucky against 131 that were shipped out. We have no record of the number of lambs shipped from Kentucky during the past season, but on account of the high prices obtained at that time, and as Louisville is known to be the largest lamb market in this country, I feel safe in saying that a greater number of lambs was shipped than ever before. Quite a number of young fat ewes were also included in this market, and to replenish their herds 15,334 stock sheep were shipped into this State and only 2,281 were shipped out. Only 113 pure-bred sheep were shipped into Kentucky, and 197 were shipped out, proving that our sheep breeders have not been inactive. One thousand seven hundred and ninety (1,790) hogs were shipped into Kentucky for slaughter, while twenty-one thousand two hundred and fifty-eight (21,258) were shipped from the State. This of course does not cover all the shipments either into or out of the State, but whatever the entire number amounts to, the hog industry is at least fair. The pure-bred breeders have shipped 430 hogs into other States, while only 243 have been brought into Kentucky. Nearly all of the latter were shipments of one or two boars or gilts for the purpose of starting a pure-bred herd. Considerable progress has been made along this line, as the feeding of pure bred hogs has been much more profitable than the feeding of the cross breeds. I believe that within the next two years the breeding of pure-bred hogs will increase at least one hundred per cent, provided we are not visited with another epizootic as dangerous as foot-and-mouth disease has been. I might make this same prediction in regard to the cattle industry. A great amount of educational work has been done and our farmers are taking advantage of the instructions given them, and I see no reason why Kentucky should not surpass every other State in the breeding of thoroughbred cattle and hogs. We have the cheapest and best food for about seven or eight months of the year, viz., blue grass, and our climate is not too severe for live stock.

CONTAGIOUS AND INFECTIOUS DISEASES.

I think it wise that this report should contain a description of the contagious and infectious diseases most commonly found among our live stock, and of the methods employed in their prevention and control. The most important of these and the one which has caused heavier losses in Kentucky's live stock than all others combined, is foot-and-mouth disease.

FOOT-AND-MOUTH DISEASE.

For information concerning the 1914-1915 outbreak of foot-and-mouth disease, you are referred to Bulletin No. 17 issued by the Department of Agriculture of Kentucky, which we believe covers the subject thoroughly. This bulletin was issued for general distribution, so that those who will read it will become thoroughly acquainted with some facts that are not generally known.

We are in possession of authentic statistical data concerning this disease in a number of foreign countries, which prove conclusively that there is only one effective method of dealing with it, viz.: Eradication at any cost. This method has been faithfully followed and the results obtained are little short of miraculous when due consideration is given to our unpreparedness for combating such a crisis. Very few veterinarians in the United States were familiar with the disease, which fact certainly caused delay in the early diagnosis, thereby allowing the disease to spread to at least twenty States other than the one in which the initial outbreak occurred. Another serious hindrance to the work of eradication was the fact that very few States were financially prepared to pay their half of the losses; even the Federal Department of Agriculture was short of funds and it was necessary that the unfortunate losers await an act of Congress.

It is estimated by scientists that the value of animals recovering from foot-and-mouth disease is depreciated to the amount of from seven to twenty dollars per head. This estimate was made without taking into consideration the value of the animals that died from the

disease. Taking the lowest estimate, \$7.00, Germany alone is said to lose \$20,000,000.00 annually. The United States has about seven times as many cloven hoofed animals as Germany, which shows that our losses would reach \$140,000,000.00 annually, if we should allow foot-and-mouth disease to become widespread over our ranges.

Our losses were light, very light, when due consideration is given to the fact that many of our live stock owners and dealers did not believe that foot-and-mouth disease was serious and would not give us the hearty cooperation in the beginning that they did after they had learned something of the nature of the disease and the great economical losses caused by its presence in our midst.

Following is a tabulated report of the losses in Kentucky:

REPORT OF FOOT-AND-MOUTH DISEASE ERADICATION IN KENTUCKY.

County	NUMBER OF ANIMALS DESTROYED.							
	Herds	Cattle	Hogs	Sheep	Goats	Appraised value	Value property destroyed	Burial expense
Bullitt	8	81	86	116	..	\$4,255.50	\$121.50	\$193.16
Hardin	22	318	182	.....	..	14,734.25	515.44	645.00
Henry	1	10	.....	.....	..	450.00	.....	18.00
Jefferson	30	1,965	383	.....	1	83,792.55	337.61	616.10
Jessamine	2	60	46	.....	..	2,328.00	.....	64.00
Larue	2	32	.....	.....	..	1,761.00	100.00	53.00
Meade	1	5	.....	.....	..	150.00	.....	17.00
Oldham	2	104	145	100	..	6,472.10	82.00	97.26
Scott	2	39	14	.....	..	4,663.00	.....	120.00
Shelby	1	35	.....	.....	..	1,404.75	.....	122.24
Woodford	14	302	66	.....	..	13,553.40	35.00	269.40
Totals	85	2,951	858	216	1	\$133,564.55	\$1,191.55	\$2,233.16

Total number counties	11
Total number animals destroyed	4,026
Total appraised value	\$133,564.55
Total value property destroyed	\$1,191.55
Total burial expense	\$2,233.16

In view of the above facts alone, we know that our efforts have been justified, and our success has been our reward.

This disease is known to be the most highly contagious of all diseases of live stock and may be transmitted in more ways than any other. The tabulation following, which was prepared July 29, 1915, will show how this disease was spread according to information secured direct from the owners of diseased herds by the veterinary inspectors engaged in the work of eradication.

METHODS OF INFECTION.
 The following table shows the number of herds slaughtered in each State, together with the methods by which infection was transmitted.

SOURCE OF INFECTION.	METHODS OF INFECTION.																Total.						
	Connecticut.	Delaware.	Dist. of Col.	Illinois.	Indiana.	Iowa.	Kansas.	Kentucky.	Maryland.	Massachusetts.	Michigan.	Montana.	N. Hampshire.	New Jersey.	New York.	Ohio.		Pennsylvania.	Rhode Island.	Virginia.	Washington.	W. Virginia.	Wisconsin.
1. Through animals brought direct from infected public stock yards for slaughter, feeding, breeding or dairy purposes.....	2	2	0	89	19	9	0	26	19	25	29	4	0	21	45	94	289	19	4	1	0	10	707
2. Through animals brought from infected stables or lots of local dealers.....	21	0	0	20	4	0	0	12	14	17	2	0	1	0	15	25	121	9	3	0	18	3	285
3. Through direct contact with neighboring infected herds, by pasture, boring infected animals, or animals not confined.....	4	6	1	115	8	13	0	31	8	6	9	25	0	2	9	28	65	13	0	0	0	2	346
4. Through infected railway cars.....	0	0	0	9	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	15
5. From creameries.....	0	0	0	25	0	0	0	0	0	0	21	0	0	0	33	2	86	0	0	0	0	2	169
6. From vaccination with infected hog cholera virus.....	0	0	0	94	5	2	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	121
7. Through persons: a. Through neighborhood visiting, exchanging work, etc..... b. Through local practitioners or dairy inspectors.....	3	0	1	147	14	9	3	8	5	13	2	0	1	15	21	25	119	4	0	0	2	5	402
c. By stock buyers, peddlers, etc.....	0	0	0	10	1	0	0	1	2	3	0	0	0	0	0	0	24	0	0	0	0	0	41
8. Through dogs, poultry, birds, etc.....	0	0	1	9	0	3	0	5	8	0	0	0	0	0	0	4	8	15	0	0	0	1	66
9. Through infected public highways.....	0	0	0	92	0	7	1	0	1	3	2	0	0	0	12	4	9	7	0	0	0	11	146
10. Through contaminated streams or drinking water.....	0	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	0	24
11. Through infected feed or garbage.....	0	0	0	1	0	0	2	0	0	1	0	0	0	0	0	3	12	0	0	0	0	0	19
12. Other known sources of infection.....	0	0	0	7	1	0	0	0	1	2	0	0	0	6	1	1	19	1	0	0	0	0	22
13. Sources of infection unknown.....	2	1	0	140	67	5	0	6	1	12	206	3	1	6	6	9	130	1	0	0	1	6	603
Total.....	33	12	3	768	120	48	61	84	56	98	272	32	3	50	130	222	304	59	8	1	22	40	3,021

Item 4 should doubtless contain a number of cases under Item 1.

Item 7 presents one of the most interesting features of the entire outbreak. Out of 3,021 infected herds, 509 were infected through virus carried on the bodies, shoes, and clothing of persons.

Under Item 13, it will be noticed that 6 herds in Kentucky were infected through unknown sources, but at least half of this number could certainly be credited to Item No. 4.

The following quotations clipped from various sources might be of interest to our readers:

"Nothing short of complete subordination of every stock owner's individual interests to the good of the State will eradicate the scourge of the foot-and-mouth disease which again is devastating Illinois farms. The State Board of Live Stock Commissioners has ample precedent, American and foreign, for its declaration, that, aside from the killing of infected herds, no effective means of stamping out the disease is known. Consideration of sentiment or individual's financial concern should not stand in the way of absolute obedience to the seemingly harsh rule that infected herds must be exterminated, and that quickly. Of course, those who suffer losses should be compensated."—(Hoard's Dairyman, Oct. 15, 1915.)

"The paralyzing effect upon the traffic in live stock which results from the outbreak and necessary quarantine, which must be established to control the disease, and which must extend over a long period, must also be considerable from an economical standpoint during the prevalence of the contagion.

"In the previous outbreaks of 1902 and 1908, which occurred in the United States, the expenditure of the U. S. Government in the eradication of the disease amounted to about \$300,000 in each instance. Between the three outbreaks, including the present one, there were six year intervals, and by distributing this expenditure over the intervening period, the total amount per year would be only \$50,000, which is very small when compared with the losses which would result if the disease had been allowed to spread over a considerable area of the country."—(Foot and Mouth Disease and Its Eradication, by Dr. J. R. Mohler.)

"Investigation to fix responsibility for the handling of diseased animals is all very well, but there is plenty of time for that. Our job now is to stop the disease from spreading further. And it is a man's job.

"The Legislature should immediately appropriate ample funds, give the veterinarians full authority, and set them at work."—(Wallace's Farmer, Des Moines, Iowa.)

"In many places animals affected by it are killed, because it costs more to cure and then fatten the animal than it is worth. In this country it always has been the policy to kill the affected animals as soon as the diagnosis was made. Following this policy, we have succeeded so far in preventing the disease from securing a permanent foothold."—(Foot-and-Mouth Disease, by Dr. W. A. Evans.)

"Whatever may be said of the original blunders leading to the spread of the disease, whatever bungling has attended the handling

of the case to date, however sound may be the arguments against purely veterinary domination for the future, there is but one thing to do now, and that is to finish this job of house-cleaning, and do it quickly and so thoroughly that confidence can be absolutely restored. So long as birds and insects have wings, a so-called quarantine foot and mouth farm is going to serve as a justification for maintaining trade restrictions that are deadly in their strangling of live stock commerce."—(Breeder's Gazette, October 7, 1915.)

"The United States has had six epidemics of the disease prior to the present one, in 1870, 1880, 1884, 1902, 1908 and 1914, all of which were quickly stamped out by the method of immediate slaughter and burial of all infected and exposed animals and cleaning and disinfecting the premises. THE UNITED STATES IS THE ONLY NATION THAT HAS ADOPTED THE SLAUGHTER METHOD FROM THE START, AND THE ONLY ONE THAT HAS EVER SUCCEEDED IN COMPLETELY STAMPING OUT THE DISEASE.

Not only is it an expensive and useless undertaking to attempt an efficient farm quarantine and cure, but in addition to that expense, even when attempted under the best of such conditions, the cost of the disease, on account of loss in the condition of the surviving animals after apparent recovery, is far greater than the loss from death outright, and there is no recovery of expenses and damages from either State or nation.

"On the other hand if the infected and exposed animals are appraised and killed by the authorities, the owner recovers their value as sound animals together with all expenses of their burial and disinfection of his premises and for all loss because of sheds, hay or other property destroyed on account of the disease."—(Facts Concerning Foot and Mouth Disease, by The Live Stock Exchange National Bank of Chicago, Illinois.

"The ignorant man can learn only from his own experience; the intelligent man will profit from the experience of others. The experience of Great Britain and the European countries shows in the clearest possible way that there is but one satisfactory way to handle foot-and-mouth disease, and that is to stamp it out by the immediate destruction of infected animals and the thorough disinfection of infected premises. Quarantine under farm conditions is impossible.

"Our practice should be to kill, bury, disinfect."—(Wallace's Farmer, Oct. 22, 1915.)

"It would not seem possible that any reader of The Gazette could be imposed upon by 'sure cure' foot and mouth fakirs, but it may be just as well to warn against the seductions of those who—for a price of course—are willing to sell valuable recipes or nostrums claimed to be infallible in the 'cure' of this infectious disease. We don't know how many of these are being offered. Probably none of the venders has the nerve to ask any reputable agricultural newspaper to carry an advertisement of his wares, but the United States mails are being used to exploit the farming community through the medium of circulars. We have brought the attention of the authorities to one particularly likely candidate for stripes in this business."—(Breeder's Gazette, April 1st, 1915.)

"Right here public opinion in the United States has a chance to stand behind drastic but effectual official measures and take a lesson from Germany's sorrow. At some time in her history Germany hesitated in dealing with the foot-and-mouth disease and today she loses \$20,000,000 worth of cattle annually. Denmark's loss is also tremendous. Even scientific and government ruled Germany can't find a way to choke out this plague, now that it has its grip set. The United States is even a greater stock raising country and stands to

lose much more, unless the government is given a free hand to stamp out the isolated sores as they have come to the surface."—(The Chicago Daily Tribune, Sept. 24, 1915.)

"Loeffler's conclusions relative to virus carriers are as follows:

"Regular supervision of such farms is indispensably required.

"One of the most important results of the researches concerning foot-and-mouth disease, is, that the fact has been doubtlessly ascertained that, just as in numerous human infectious diseases, some of the recovered animals will remain carriers and continue the spreading of the virus.

"It seems that the number of such animals is limited.

"How long such animals can spread the virus has not yet been ascertained. According to present experiences, even seven months after the end of the epizootic, new infections have been caused by them.

"As yet no method is known to distinguish the virus spreaders.

"Infected animals are to be placed under observation for at least seven months. They must not be offered for sale and should be kept separated from healthy animals."—(Address of Veranus A. Moore, N. Y. State Veterinary College, Ithica, N. Y., at the Foot and Mouth Disease Conference, Chicago.)

When foot-and-mouth disease is prevalent it might be well to comply with the following suggestions, which are made by the Bureau of Animal Industry, together with the State Board, Live Stock Commissioners of Illinois, and supplied to Illinois farmers:

"Kill all flies possible. Flies follow horses from infected premises to town, and from there are carried away on other horses to other farms. When an infected herd is slaughtered the flies that have followed them go to other animals in nearby pastures. Make flytraps out of sugar barrels or kegs and set them about the barn and feedlots. Bait the traps with a mixture of cider, vinegar and sugar.

"Locate your pasture as far away as possible from your neighbor's pasture and away from railroads and public highways.

"Keep your cattle away from your neighbor's fences.

"Keep your line fences in good repair.

"Do not feed skimmed milk procured from public creameries.

"Don't buy feed in second hand bags.

"Don't graze your live stock on public highways.

"If you hear of any disease on farms upstream, move your animals back immediately from the stream.

"Keep your dogs tied.

"Don't allow your cats to leave the premises.

"Confine your pigeons instead of attempting to shoot them. At this time of the year pigeons fly far when scared from shooting. If scared away they may carry the infection to some herd or bring it back home when they return several days later.

"Bury or burn immediately all animals that die on the farm, and thus avoid attracting crows and buzzards.

"Stay away from public gatherings; don't mingle with the crowd that usually collects in town on Saturday afternoons.

"Postpone Sunday visiting until there is no more foot-and-mouth disease in the neighborhood.

"Post notices at your gates requesting visitors to stay out; don't allow live stock buyers, junk peddlers, gypsies, or tramps to enter your premises. Don't allow fishing, hunting, or nut gathering on your premises. Don't allow anybody to enter your premises except for good and sufficient reasons."

The following is a tabulated report of the work of eradication in the 1914-1915 outbreak of foot-and-mouth disease in every State to July 15, 1915, which is self-explanatory. Following the report is an additional tabulation of an outbreak in Illinois due to the use of anti-hog cholera serum contaminated with foot-and-mouth virus. This outbreak was discovered on August 8, 1915, and continued almost constantly until November 26th, at which time this additional report was made. Several herds, however, have been slaughtered since November 26th, which will increase the total slightly. This report is supplied by the United States Department of Agriculture from records received from their inspectors in charge in the different states.

REPORT OF ANIMALS SLAUGHTERED AND STATISTICS ERADICATION OF FOOT-AND-MOUTH DISEASE,
1914-15—TO JULY 15, 1915.

STATE	Herds	Owners	Premises	Cattle	Swine	Sheep	Goats	Total No. Animals	Total Appraised Value	Burial Expenses	Property Destroyed in Disinfecting
Connecticut	33	33	32	739	143	0	0	876	\$48,336.10	\$2,358.46	\$1,341.39
Delaware	12	12	12	152	49	22	0	223	8,067.76	1,325.10	509.50
District of Columbia	3	3	3	48	5	0	0	53	3,207.00	1,215.00	10.80
Illinois	786	764	709	24,338	33,434	1,248	22	59,042	1,996,244.48	66,471.19	99,287.60
Indiana	120	115	106	2,355	3,871	615	0	6,841	178,652.76	4,315.93	1,689.06
Iowa	48	48	43	1,547	2,334	32	0	3,913	125,277.38	4,359.22	1,329.48
Kansas	6	9	6	1,217	313	0	0	1,530	78,921.98	1,629.74	108.86
Kentucky	84	79	73	2,951	918	216	1	4,086	134,260.00	2,362.50	1,191.55
Maryland	56	56	49	964	1,621	197	0	2,782	64,207.34	3,339.66	6,201.26
Massachusetts	98	96	94	2,107	5,705	77	11	7,900	230,768.13	8,631.77	8,489.76
Michigan	272	271	239	2,947	3,993	852	0	7,792	210,175.84	5,381.21	1,617.50
Minnesota	32	32	15	1,408	11	237	0	1,656	67,492.70	881.12	77.50
Montana	3	3	3	78	26	0	0	104	4,959.50	189.95	279.50
New Hampshire	50	49	49	1,314	815	9	8	2,146	123,006.88	952.95	1,570.22
New Jersey	180	193	163	5,410	4,839	150	38	6,087	442,308.37	10,076.39	7,360.65
New York	222	221	204	4,019	4,994	3,136	1	12,150	363,100.41	12,744.54	2,687.82
Ohio	904	858	795	14,939	12,055	3,369	17	27,430	934,197.61	17,684.88	77,958.40
Pennsylvania	59	58	54	988	375	33	0	1,396	68,950.50	5,164.63	2,418.12
Rhode Island	8	8	6	378	470	0	0	1,848	26,052.60	5,500.44	896.54
Virginia	1	1	1	102	0	0	0	102	4,950.00	.....	.....
Washington	22	22	14	193	189	114	0	496	12,813.16	458.84	1,308.44
West Virginia	40	40	37	1,504	1,764	1,435	1	4,704	119,158.06	6,025.70	3,969.56
Totals	3,021	2,961	2,707	69,742	73,574	8,742	99	152,157	\$5,243,138.55	\$156,049.22	\$220,158.51
Illinois, July 15th to Nov. 26th, 1915	430	405	327	6,415	11,763	754	16	18,948	544,021.00	.....	.....
	3,451	3,366	3,034	76,157	85,337	9,496	115	171,105	\$5,787,159.55	.....	.....

TUBERCULOSIS.

With the exception of foot-and-mouth disease, tuberculosis has been the subject of more widespread discussion than any other disease affecting live stock. It is more universally distributed than any other disease, and comparatively few localities are free from it. Complaints are made by farmers and live stock raisers of the losses sustained by its prevalence in their herds resulting frequently in the death of animals and materially decreasing the price for which the affected animal may be sold, and the impossibility of determining whether or not the animal is affected. Butchers, particularly the packers, are at times forced to complain against the public for having bought animals apparently in good health when upon post mortem examination by trained inspectors portions of the carcass and sometimes the entire carcass is condemned as unfit for food because of generalized tuberculosis. I might call attention here to some statistics furnished by the Bureau of Animal Industry gathered from reports of different packing houses scattered all over the country in which Federal meat inspection is maintained. During the fiscal year of 1914, reports of inspections show that 8,539,021 cattle were inspected at the time of slaughter, and that 30,145, or about 3.5%, were condemned on account of generalized tuberculosis, and that portions of the carcasses of 45,283, or a little more than 5%, were condemned for local tubercular lesions. Tuberculosis of hogs is very closely connected with bovine tuberculosis, as fattening swine are so often permitted to feed with cattle, and it is most probable that the disease is contracted in this manner. During the same fiscal year there were 33,289,705 hogs inspected at the time of slaughter and 48,252 carcasses condemned for generalized tuberculosis, and portions of the carcasses of 407,151 condemned for local tubercular lesions. These statistics of course include animals shipped into the packing houses from every part of the United States, showing conclusively that few communities are free from this disease. Tuberculosis is caused by the bacillus tuberculosis, and the bacillus causing the disease in the human is practically identical with the one causing bovine tuberculosis. The relationship of bovine

and human tuberculosis is so close that the control of the disease in either the human or the bovine materially decreases the prevalence in the other. It has been conclusively proven that the disease may be transmitted from the animal to man and from man to animal. It has been shown that where an attendant of a dairy was suffering from tuberculosis the disease spread to the cows themselves. It has also been shown that attendants free from tuberculosis have contracted the disease from their constant association with tubercular cows. Tuberculosis seldom ever assumes an acute form, except in the very advanced stages of the disease after the animal has been suffering for a considerable length of time. Records of the prevalence of tuberculosis in herds in a great many states prove that the disease is increasing, due principally to the fact that the public will not co-operate with the sanitary authorities in its control. One or two states in the Union have made considerable progress in the eradication of this disease. The live stock sanitary officials co-operating with the city, county and state boards of health have educated the public in the necessity of eradicating tuberculosis, not only for the benefit of the live stock industry, but for the safety of the human family, particularly children whose principal diet is cows' milk. Tuberculosis in the milk cow is very much more dangerous than in the purely beef animal, as the tubercular bacillus seldom lodges in the muscle, but is very frequently found in the milk. The diet of children, particularly those under four years of age, is composed chiefly of cows' milk, and this milk is fed to them raw, while what meat is eaten has been subjected to high temperatures while cooking. The natural resistance of the child is greatly less than that of the adult, which accounts for the increased mortality in children over that of the adult. It is safe to look upon the dairies, that contain pure bred cattle that have not been tuberculin tested, with suspicion, as cattle of this class have been great scatterers of tuberculosis, caused no doubt by the methods employed in their care and attention, while the scrub or grade is allowed more freedom and spends more time in the open.

At breeding centers where pure bred cattle are kept tuberculous animals are frequently found unless the herd is kept free by tuberculin testing at regular intervals, and these animals are sometimes shipped to other points and carry infection into healthy herds. It is estimated that the number of tuberculous milking cows is very much greater than that shown by figures from the packing houses. In the District of Columbia a few years ago the tuberculin test was administered to 4,200 cows; of this number 503 were found to be tubercular, and 139 were considered suspicious. During recent investigations carried on in the hospitals of New York City investigators determined that 5% of the human tuberculosis was caused by the tubercular bacillus of the bovine type. Practically all of these were in children under twelve years of age, and it is a reasonable conclusion that their infection came from drinking milk from tubercular cows. Nine and three-tenths per cent. (9.3%) of all fatal cases of tuberculosis in the children's hospitals proved to be of bovine origin. As Kentucky occupies an unenviable position on the tuberculosis map of the United States, it is most reasonable to believe that conditions quite similar to those existing in New York are present here. It seems to me that the time is ripe when some effort should be made to control tuberculosis in animals at the same time that the medical profession is attempting to prevent and control the ravages of this disease among our human inhabitants. Cattle breeders and owners of cows supplying milk to our towns and cities have reason to object to the slaughter of their herds when reacting to the tuberculin test or found to be tuberculous in other ways when no compensation is allowed for their slaughter. Foot-and-mouth disease does not kill people, but tuberculosis does, and it seems that it would be just as necessary to slaughter tuberculous animals as those affected with foot and mouth disease. If while the next General Assembly is in session laws should be enacted by which progress could be made in the prevention of the spread of this disease to the human family, Kentucky would be placed among the first states in the Union to properly provide for the health of its inhabitants, and the legislators would receive the praise not only of the

people of Kentucky, but of those of the entire world. If a law should be enacted by which owners could receive even 50% of the appraised value of tuberculous cattle, great strides could be made in the control of this disease. No owner wants tubercular cattle, and I feel sure that all owners would gladly permit the slaughter of their tubercular cattle were they to receive compensation therefor.

In writing this article it has been my intention to show as clearly as I am able to do the danger in permitting tubercular animals to remain among healthy animals, and the danger of permitting the sale of milk from tuberculous cows for use by the human family. The entrance into the state of tuberculous animals is prevented by the rules and regulations of the State Live Stock Sanitary Board of Kentucky, but neither the law under which this board operates, nor its rules and regulations control that which is already present in the state, and it is for the purpose of controlling this disease within the state that I suggest the above mentioned legislation. As it is impossible to accurately diagnose tuberculosis by clinical symptoms, it is necessary to resort to the tuberculin test to determine whether or not a suspected animal is affected with the disease. While neither of the popular methods of testing is infallible, both are considered reliable, as comparatively few cases reacting to a properly conducted test fail to show that tuberculosis is present.

HOG CHOLERA.

It is estimated that Kentucky's annual loss from hog cholera is very close to two million dollars. In view of the fact that it has been definitely proven that hog cholera is a preventable disease, such heavy losses are appalling. Almost every state in the Union has hog cholera constantly present within its boundaries. The more extensive the hog industry becomes the more frequently are we visited with outbreaks of hog cholera. Numerous bulletins have been issued by the Kentucky Agricultural Experiment Station, in which hog cholera has been described in all its phases and recommendations for its control and eradication have been made. We have now begun a systematic fight against this plague and at

this time I am glad to say results so far obtained are flattering. Hog cholera clubs have been organized in a great many counties and in different communities in these counties. At regular intervals these clubs are instructed by experts in the methods which have proved most effective in controlling this disease. There is quite a difference of opinion among authorities on this subject in regard to the two popular methods of immunization. Some of our best authorities advocate the simultaneous treatment, others again advocate the serum alone treatment. The consensus of opinion, however, favors the serum alone method followed by proper sanitary measures. More or less danger follows the use of the simultaneous treatment, but we know that when serum alone is properly administered no bad results follow, and it is not a hard matter to control outbreaks of hog cholera when proper sanitary measures are followed after the use of the serum alone in infected herds. It is a well known fact that potent anti-hog cholera serum will protect the hog against cholera infection; duration of the immunity thus conferred varies. A great many herds have been kept free from disease after the use of the serum alone when directly exposed to cholera. The injection of the serum confers an immunity for a sufficient length of time to thoroughly clean and disinfect the premises, after which there is little or no danger of an outbreak in this herd if communication between these healthy animals and diseased ones in the neighborhood is prevented. Anti-hog cholera serum is manufactured in a great many states in plants controlled by the state. There are also about 125 commercial serum plants in the United States. The serum manufactured at the Kentucky Agricultural Experiment Station at Lexington has been of untold benefit to the hog raisers of this state. This plant was established in 1911 and has been remodeled and enlarged as the occasion has demanded until now we are proud to state that our serum plant compares favorably with any other. From the time of its completion until September 1, 1915, 3,790 herds, composed of 156,083 hogs, were treated with serum alone, and serum and virus. In a large number of these herds the disease was so far advanced that only a few were treated, and frequently these

few recovered, while the rest of the herd died. Serum is used and recommended as a preventative only, while if used in the early stages of the disease recovery frequently results. Of the 156,083 hogs vaccinated, 121,463 lived, and 12,090 died. That only 9.12% died, most of which were found in diseased herds, is sufficient proof that the serum will protect. Little progress can be made in the control of any contagious or infectious disease without the co-operation of the owners of live stock along sanitary lines. Hog pens and hog houses should be kept clean and should be frequently disinfected; clean beds, clean troughs, and clean water should be provided. In 1914, the Bureau of Animal Industry of the United States Department of Agriculture selected one county in twelve states for the purpose of proving whether or not hog cholera could be eradicated from a given area. Henderson county was selected in Kentucky, and considerable progress has been made in this work, and the following figures will show that good results may be obtained:

Number of hogs raised in Henderson County in 1912.....	35,814
Number of hogs died in Henderson County in 1912.....	8,743
Number of hogs raised in Henderson County in 1913.....	30,866
Number of hogs died in Henderson County in 1913.....	3,934
Number of hogs raised in Henderson County in 1914.....	20,000
Number of hogs died in Henderson County in 1914.....	3,902
Number of hogs raised in Henderson County in 1915.....	20,000
Number of hogs died in Henderson County in 1915.....	1,974

The use of serum alone has undoubtedly saved the lives of at least 1,118 hogs in one year, and in view of the fact that serum was used in infected herds only and large numbers of already sick animals were treated, the results obtained are very satisfactory. Equally as good results can be obtained on any farm if the proper measures are adopted.

GLANDERS.

This is one of the most dangerous, as well as the most loathsome, disease with which we have to contend. It is particularly dangerous because it is transmissible to man and is just as fatal in man as in the animal.

Horses, mules and asses are most commonly attacked by glanders. Arranged according to their susceptibility to glanders, the ass comes first. This animal is easily infected and rarely develops the disease other than in the acute form. The mule is slightly less susceptible and will occasionally develop the chronic form. The horse is least susceptible and often shows the disease in the chronic form and will sometimes re-act to the mallein test without ever having shown any clinical symptom.

Glanders is caused by the introduction into the system of the bacillus malleus. After infection the disease may become manifest in two weeks, but sometimes months may elapse before any external symptoms are shown. Usually the first indication of glanders is a discharge from one or both nostrils, or the appearance on the body or legs of small nodes which break open and become angry looking ulcers, which show little or no tendency to heal even with treatment. This latter condition is known as "farcy," and true farcy is cutaneous glanders and should be very carefully treated, as there is so much danger of its transmission to the man attending. When a discharge from the nostril is noticed, an examination of the nasal mucus membranes should be made and characteristic ulcers may be found on the septum nasi, or the membrane which divides one nostril from the other. And always the submaxillary glands will be enlarged; the size of the enlargement and its condition are governed by the intensity of the ulceration of the nasal mucus membranes.

The treatment of glanders is similar to the treatment of leprosy in man; it seldom, if ever, is successful. It is not advisable to attempt the treatment of an animal suffering with glanders, but, on the contrary, it should be destroyed and the carcass burned to ashes and all woodwork, water troughs, feed boxes, harness, etc., should be burned or thoroughly cleaned and disinfected. All exposed, susceptible animals should be subjected to the mallein test, and re-actors to the test should be dealt with the same as in acute cases. The mallein test may be made in either of the two reliable methods. The subcutaneous test is made by recording the body temperature every two hours for six or eight hours, and then

the mallein injected subcutaneously. Beginning eight or nine hours after the injection, the temperature should be recorded every two hours for eight or ten hours. The difference in the temperature before and after the injection determines whether or not the animal is infected. Two degrees Fahr. is considered suspicious and two and a half or three degrees is considered a re-action. The other and by far the most satisfactory method, because less time is required and just as reliable, is called the ophthalmic test. This test is made by the instilling into the conjunctival sac of the healthy eye one or two drops of crude mallein. If the animal is infected, the eyelids will swell and in eight or ten hours afterwards pus will be discharging from the eye, which indicates infection.

There are other tests, which are slightly more accurate and reliable than either of the above, but a laboratory and special preparations are necessary. The agglutination test, the complement fixation test, and the precipitin re-action are gaining more favor because there are more laboratories available now than ever before. However, the subcutaneous or the ophthalmic tests are satisfactory.

We have been very fortunate during the past year, as only one known outbreak of glanders has occurred in this state, and that was on a farm in Jessamine county, where one mare, a standard bred trotting mare, was showing clinical symptoms of nasal glanders, but as no diagnostic symptoms were manifested, the ophthalmic test was made with a typical re-action. The complement fixation test was also made to conform the diagnosis. The result of this test was just as was expected and confirmed the diagnosis made by the ophthalmic test. The animal was destroyed. All exposed animals were tested, but only one re-actor was found, and this one was immediately destroyed. The stalls where these animals had been kept were thoroughly cleaned by burning all loose lumber and washing that remaining with a 5% solution of Cresol Compound. All harness was soaked in a strong disinfectant solution before it was used by other animals. Stable manure, etc., containing the secretions from these animals was burned. No other suspected cases have been reported from that community.

BLACK LEG.

This is an acute, infectious disease affecting cattle, and very often other ruminants and swine. It is caused by an anerobe known as the *Bacillus Emphysematosa*, which may reproduce itself in the soil or pastures. This germ when entering the system produces the disease, which is characterized by local, crepitant swellings at almost any point on the body or limbs above the knees and hocks. It is most commonly found affecting animals between the ages of four months and two years, and is occasionally found in suckling calves, and in animals three or four years of age, when such animals are placed on infected pastures. All breeds of cattle are equally susceptible, but pure bred cattle are less frequently attacked because of the better attention which they receive. The excretions from diseased animals may remain virulent for an indefinite period after coming in contact with the earth and may transmit to a healthy animal the disease through a skin abrasion while the animal is lying on the ground contaminated with the virulent excretions of a diseased animal or the carcass of one dying from the disease. Black leg is a disease that is connected with infected soil, and the bacilli seem to be capable of reproducing the disease and preserving its virulency even under unfavorable conditions. The bacteria from diseased animals also remain virulent in the soil. There is no doubt but that these facts will account for the disease re-appearing in the same locality or in the same pastures when susceptible animals are placed thereon year after year. Animals may also become infected by eating infected feed or drinking water from streams into which bacteria have been washed from infected grounds. This is a disease that is not difficult to diagnose, as the symptoms manifested are characteristic. Among the first conditions noticed is lameness. In a very short while it will probably be noticed that the animal is down and unable to rise. Upon examination a distinctly circumscribed swelling will be found usually in the region of the shoulder or the hip, occasionally below the hip or the stifle. This condition is often mistaken for a bruise, leading the owner to believe that the

animal has been kicked or has fallen, but when the swelling is closely examined by passing the hand over it, a sound peculiar to the disease is heard, as if the skin had been blown up with air. The black leg bacillus is an air producing germ, and when the swelling is excised, the exudate is a foamy, black fluid with an odor very similar to rancid butter; the muscular tissue underneath this swelling is of a very dark color; hence the name Black Leg. The swelling at first is hot and painful, later becoming cold and stiff with the skin assuming a parchment-like condition, so that the animal finally does not evince pain upon pressure. The rapid course and the development of the characteristic crepitant swelling makes the diagnosis fairly easy. The disease very seldom, if ever, is found to exist among animals that are continuously stabled. Treatment of animals affected with black leg is seldom ever attempted, because it has been shown that the percentage of recoveries does not in any way justify it. The safest method of procedure in herds, in which the disease exists, is to slaughter diseased animals and to vaccinate all susceptible exposed animals. Vaccination consists of injecting subcutaneously attenuated virus, which will confer an immunity lasting as a rule long enough to protect the animal until it is old enough to acquire a natural immunity. To successfully control outbreaks of this disease I wish to call particular attention to the disposition of the carcasses. Animals dying from black leg should not be removed from the point where they are found. If it actually becomes necessary that such carcass be removed, do not drag it over the ground, as the fluids discharged will infect the soil, and the danger of future outbreaks increased. All carcasses should be completely burned, and not buried in a shallow grave, as is customary. No carcass should be left lying on the ground where dogs, cats, birds or vermin might visit, as any of the above might carry the infection to clean pastures or herds. The removal of the hides of these carcasses should not be permitted under any circumstances. The disinfection of the ground by the free use of lime and a strong disinfectant solution is necessary. Comparatively few counties in the state have escaped outbreaks of black leg in the last year, but the

losses by death when compared to the number of animals exposed has been small. This can be accounted for by the early diagnosis and the effective vaccination of exposed animals.

RABIES (Hydrophobia).

Rabies is an acute, contagious disease most commonly found to exist in dogs, cats and other carnivorous animals. It may be transmitted to man and to other animals by the bite of an affected animal. It is always fatal except where treatment is begun before clinical symptoms of the disease are manifested. The danger of the bite of a rabid animal depends entirely upon the virulence of the saliva and the number of nerves and lymphatic vessels in the wounded part of the body. After the bite of a rabid animal the disease does not always follow, barely in 60% of the cases. The disease, no matter how virulent, cannot penetrate through the uninfected skin. All animals are susceptible, and the breed or sex has absolutely no influence on susceptibility. It is believed that young animals manifest the disease after a shorter period of incubation than older animals. The disease is usually manifested in from two to eight weeks after the bite, but the period of incubation has been known to extend to several months. The disease is characterized by extreme nervousness and excitability in the early stages, followed by periods of depression and paralysis invariably ending in death in from two to four days. Violent rabies attacks most commonly dogs living in the open and of a biting nature, while dumb rabies is that most commonly found in house dogs and pets. The same symptoms are presented in almost all other animals, except that herbivora have not the intense desire to wound by biting. There is a theory of long standing that the rabid animal was afraid of water and would die at sight of it. This is a mistake, as it has been proven that the rabid animal has an abnormal thirst and will drink whenever the opportunity presents itself until in the later stages of the disease the muscles of the throat become paralyzed and frequently a general collapse follows the excitement and the frequent attempts to swallow.

No treatment is satisfactory in an animal after the disease is manifested, but during the period of incubation, as soon as possible after inoculation, a prophylactic treatment is very satisfactory. Frequently immediately after being bitten powerful caustics will kill the virus before it is taken up by the blood circulation. But as one can never be certain of this result, it is advisable to take the serum treatment, which has been frequently administered by the State Board of Health authorities at Bowling Green, Kentucky. Losses from rabies in Kentucky have been comparatively small in the last year. Only three infections have been reported, all of which were in cattle following the bite of a rabid dog. In each instance the dog was killed before it had done very great damage.

FOOT ROT OR NECROBACILLOSIS.

Foot rot in sheep has been more or less prevalent for the past several years. The losses sustained, when compared to the number of animals affected and those exposed, are small. This disease is amendable to treatment and should not be allowed to affect any great number of animals in a flock. It is spread from the diseased to the healthy animal through the media of pus containing the infection, which may be distributed in pastures, chutes, pens, or on the public highway. When the disease is found in a flock, the healthy animals should be removed from the pastures on which the diseased animals are left, and all diseased animals should be subjected to a treatment which is principally cleanliness. After the diseased parts are thoroughly cleansed with antiseptics, a mild astringent dressing is very beneficial. In advanced cases, it is wise to occasionally use caustics, and if treatment is persisted in, a cure will result in a comparatively short time. Sheep should not be placed on infected pastures for at least sixty days.

SHEEP SCABIES.

During the year 1910, Kentucky was placed under Federal quarantine on account of the prevalence of scabies among the sheep in this state, and all shipments of sheep interstate were prohibited except for immediate

slaughter. But, through the excellent results accomplished by Dr. A. J. Payne, of the Bureau of Animal Industry of the United States Department of Agriculture, and his force of trained men, the state was released from quarantine on May 1, 1913. Since that time very few infested flocks have been located. This trouble is usually controlled by the frequent dipping of infested flocks in either of the coal tar dips or preferably the lime and sulphur dip recognized by the Bureau of Animal Industry as being the most effective in the eradication of sheep scabies. The result of the infestation of a flock is a general unthriftiness of infested animals and a considerable loss of wool.

PART SIX

**THE WORK OF THE COUNTY AGENTS AND
CANNING CLUB AGENTS IN KENTUCKY
UNDER THE CONTROL OF THE
FEDERAL DEPARTMENT OF
AGRICULTURE IN CO-OPER-
ATION WITH THE STATE
UNIVERSITY**

INTRODUCTION

FARM DEMONSTRATION WORK.

It is not claimed by the State Department of Agriculture that the farm demonstration work is a part of the work of the department. Originally this department contributed out of its finances to the founding of the demonstration work in the State, working co-operatively with the Federal Department of Agriculture. After Congress had passed the Smith-Lever bill and had assumed the appropriations formerly made by the Rockefeller Foundation Fund, the co-operative arrangement was made with the State University at Lexington.

It will always be a source of pride to the present Commissioner that it was upon his initiative that the annual appropriation of \$45,000 from the Federal Bureau was apportioned to Kentucky for the farm demonstration work. These funds are used for the extension work in this State, and the department gladly prints herewith reports from several of the county demonstration agents in Kentucky, whose salaries are now maintained upon a basis of the county paying one-half of their salary, and the Federal Government the other half. There are some forty counties in Kentucky who have regularly employed county agents. The variety of assistance rendered by these agents to the farmers can be gathered from their papers as published herewith.

A list complete to date of all county agents in Kentucky, with their addresses, is appended that those interested may write them direct. Demonstration work in Kentucky has only begun, and no field of endeavor offers greater possibilities than this one.

J. W. NEWMAN, Commissioner of Agriculture.

LIST OF COUNTY AGENTS

County	Name	Address
Ballard.....	Hall, Dudley J.....	Barlow
Boone.....	Brockway, Robert D.....	Burlington
Boyd.....	Richardson, G. C.....	Catlettsburg
Christian.....	Puckett, S. E.....	Hopkinsville
Crittenden.....	Bird, J. R.....	Marion
Fleming.....	Clayton, W. H.....	Flemingsburg
Franklin.....	Felts, R. H.....	Frankfort
Gallatin.....	McDanell, J. R.....	Warsaw
Grant.....	Fullerton, D. H.....	Williamstown
Hardin.....	Pittman, E. E.....	Elizabethtown
Henderson.....	Brown, P. D.....	Henderson
Hopkins.....	Taylor, Chas. L.....	Madisonville
Jackson.....	Reynolds, W. R.....	Tyner
Jefferson.....	Merriman, F. E.....	Louisville
Kenton.....	Rhoades, Wayland.....	Independence
Knott.....	McSwain, Horace E.....	Hindman
Knox.....	Tye, William.....	Barbourville
Laurel.....	Morgan, Sam.....	London
Lawrence.....	Kegley, E. S.....	Louisa
Logan	Rogers, W. H.....	Russellville
Madison.....	Collins, T. H.....	Richmond
Madison.....	Spense, Robert F.....	Berea
Mason.....	Casey, A. M.....	Maysville
Mercer.....	Gentry, J. C.....	Harrodsburg
Metcalf.....	Bushong, P. W.....	Edmonton
Monroe.....	Palmore, E. C.....	Tompkinsville
Muhlenberg.....	Finley, A. Y.....	Greenville
McCracken.....	Kilpatrick, E. J.....	Paducah
Ohio.....	Browder, W. W.....	Hartford
Oldham.....	Taylor, John T.....	Lagrange
Pendleton.....	Smith, Graham A.....	Falmouth
Pulaski.....	Wilson, W. C.....	Somerset
Simpson.....	Gayle, H. K.....	Franklin
Trigg.....	Varney, K. L.....	Cadiz
Todd.....	Wyatt, George T.....	Elkton
Whitley.....	Faulkner, E. H.....	Williamsburg
Woodford.....	Floyd, C. F.....	Versailles

REPORTS OF AGENTS.

BALLARD COUNTY.

VISITS.

I have made 190 visits to demonstrators, and 137 visits to co-operators. Total number of visits, 348.

I have been interviewed on the road 68 times, and in the office I have had 30 interviews. Total number of interviews on subjects of importance, 98.

I have met and talked with 1,109 men engaged in farming business in my territory; about seven of this number are owners of land, the remainder are renters.

There are about 325 live names on my mailing list. Traveled 1,595 miles by team, and 180 by railroad.

Have written 287 letters. Distributed 100 letters on Alfalfa in Western Kentucky, 100 on Crimson Clover and 100 on Fall-sown Red Clover, and have posted 107 farmers' notices.

Have administered serum to 214 hogs.

Have been called 78 times over the telephone, and have sent 17 telegrams.

Have distributed approximately 600 farmers, and experiment bulletins. This is not in detail.

MEETINGS.

Feb. 7—Organized Corn Club at Barlow, 60 present.

Feb. 14—Organized Corn Club at Bandana, 38 present.

Feb. 15—Organized Corn Club at LaCenter, 49 present.

Mar. 15—(Bandana Corn Club.) Talked on preparation of seed bed.

Mar. 19—(Farmers' Club, Kevil.) With E. J. Kilpatrick. Talked on Live Stock Raising, 40 present.

Sept. 4—Wickliffe (Teachers' Institute). Talked on Co-operation of Teachers in Club Work, 200 present.

Sept. 24—LaCenter (Country Improvement Club). Talked on Clover Crops and their Uses, 215 present.

Total meetings, 7; total attendance, 482.

FIELD MEETINGS.

- Mar. 22—C. H. Berbling, tree pruning (fruit), 8 present.
 Mar. 24—L. W. Miller, tree pruning (fruit), 6 present.
 Mar. 26—S. D. Lovelace, tree pruning (fruit), 9 present.
 Mar. 30—B. F. Cotner, tree pruning (fruit), 12 present.
 Apr. 6—J. L. Watson, tree pruning (fruit), 4 present.
 May 15—R. H. Tanner, straw spreader, 22 present.
 Sept. 9—Andrew Miller, selecting seed corn, 4 present.
 Sept. 15—B. F. Cotner, field selecting seed corn, 3 present.
 Sept. 18—C. E. Mattingly & Son, field selecting sunflower seed (object), to select heads born singly on the stalk; well filled, short stalk, and not near stalk that has more than one head to the stalk.
 Sept. 23—Oscar Winn, field selection of seed corn, 5 present.
 Sept. 28—Frank Holland, field selection of seed corn, 5 present.
 Total field meetings, 11; total attendance, 80.

LIVE STOCK PURCHASES.

- J. P. Page, registered Holstein bull, two registered cows.
 C. J. Barlow, 1 registered Hampshire boar, two registered sows.
 R. H. Tanner, 1 registered Hereford bull, two registered cows
 (and eight high grades.)
 T. R. Johnson, 1 registered Hereford bull, two registered cows
 (and six high bred grades.)
 T. H. Strickland, 1 registered Duroc Jersey boar.
 Total spent for pure bred live stock, \$1,745.00.
 Three cars of feeders purchased to be finished on ensilage, 130 head
 in the three cars, average cost per cwt., \$7.65.

OTHER PURCHASES BY DEMONSTRATORS.

- | | |
|----------------------|--|
| One manure spreader. | One straw spreader, |
| One lime spreader. | Nine spraying outfits. |
| | Six tandem attachments for disc harrows. |

LIME AND FERTILIZERS PURCHASED.

- One car acid phosphate, 45,000 lbs., Barlow, Ky.
 One car acid phosphate, 36,000 lbs., LaCenter, Ky.
 This is the first chemical plant food used in this county, and cost \$14.40 per ton f. o. b. Barlow and LaCenter.
 One car ground lime stone, 43 tons, to be used on alfalfa.
 One car ground lime stone, 32 tons, to be used on alfalfa.

SILOS.

There has been erected six concrete silos and three wooden ones due to demonstration work. These concrete silos are the first in the county, and have an average capacity of one hundred and ten tons, and an average cost of \$321.00.

The three wooden silos are 10'x28', 50 tons capacity; 12'x28', 75 tons capacity; 14'x30', 120 tons capacity;

ity. These silos were filled under my supervision, and all the corn was put in when as near the right stage as circumstances would permit.

All the concrete silos have continuous doors, are coated inside with tar and have shingle roofs. There are seven other silos in the county, and four of them were filled under my supervision.

HORTICULTURE.

I have direct charge of selection of varieties, setting, and culture of the following orchards:

J. R. Gholson, 27 acres.....	Barlow
Mrs. Jno. Cocke, 12 acres.....	Wickliffe
C. H. Berbling, 8 acres.....	Barlow
C. P. Howel, 24 acres.....	Barlow
C. R. Rowland, 9 acres.....	Barlow

The following old orchards have been cared for under my direction:

W. H. Megary, 4 acres.....	Barlow
Oscar Winn, 4 acres.....	Barlow
R. H. Tanner, 6 acres.....	Barlow
L. W. Miller, 10 acres.....	Kevil
H. L. Nance, 24 acres.....	Kevil
S. D. Lovelace, 5 acres.....	Kevil
B. F. Cotner, 11 acres.....	LaCenter

Pruned 263 fruit trees as samples of correct pruning.
Held 6 demonstrations in spraying.

FIELD CROPS.

12 Dem. in corn other than club acres.
8 Dem. in tobacco (dark).
4 Dem. in tobacco (burley).
Have 37 acres sown in crimson clover in 7 different places.
Have 31 acres sown in red clover in 9 different places.
Have 18 acres sown in alfalfa in hills, and 64 acres in river bottom.
There are about 250 acres in the county.
Have 4 demonstrations in soy beans.
Have 1 demonstration in white clover.
Have 1 demonstration in potatoes (Irish).
Have 10 demonstrations in tomatoes.
Have 237 acres sown in orchard grass in 12 different places.
Have 11 pastures and one for seed.
Have 137 acres in barley (winter) in 5 demonstrations.
Have 400 acres in sunflowers in 1 demonstration.
Total demonstrations, 80.

D. J. HALL,
County Agent.

BOYD COUNTY.

In my eight months' work in Boyd county I have been conservative as to the demonstration work undertaken. I have taken up only those things I know to be thoroughly practical and feasible in every detail. The demonstration work as a whole has been a success. There have been failures, but they have been such that the farmers can see the cause, and consequently have never condemned the work in one single case.

There has been opposition, of course, as there is when any new proposition comes up, but I believe most of it is fast fading away.

Data, I suppose, is mostly what is wanted in this report, and that will probably reveal more to one not upon the ground than anything else, but it is difficult to give a report of the actual work done. I will give the data wanted in the nature of a summary, and will comment later.

The demonstration crops used and the acreage are as follows:

Name of Crop	No. of Demonstrations	Acres
Corn	25	73
Oats	2	2
Cowpeas	5	28
Alfalfa	1	6
Crimson Clover	6	53
Rye and Crimson Clover	3	12
Rye	5	16
Barley	2	2
Winter Oats	3	4
Potatoes	5	3
Wheat	1	6
Pasture	1	2
Totals	59	207

The above does not include the seven lawns under demonstration.

This has been an exceptional season for crops, and especially for corn, except in the wettest bottom lands.

The corn crop of Boyd county is far better than the average, the yield averaging about 30 bushels per acre this season. The demonstration corn will average 45 bushels per acre. Some which was upon fairly good soil to start with will go as high as 90 bushels per acre,

while some that was ruined by water will not yield more than 25 bushels per acre.

The oats demonstration showed up fine. In each case the demonstration plat was in a field of from three to five acres, and the results could be seen at a distance of half a mile. Those under demonstration were all during the growing season from three to six inches taller than those growing beside them untreated. The yield in one was about forty bushels per acre, while the untreated was about twenty-five.

The cow peas have been a success in every case, and they certainly responded to the treatment of acid phosphate.

The alfalfa demonstration was a complete failure. One cause was that Mr. Calvin wanted to sow it in the spring, and as a result it was smothered by weeds.

The crimson clover demonstrations have been a success in nearly every case. In one or two instances the demonstrator failed to get a good stand due to a short drought striking it just at the wrong time.

Crimson clover has taken with the people like Johnson grass takes to the soil. There has been as much as one hundred and fifty acres sown in the county as a result of the demonstration work, when ten acres is more than was ever sown before in the county.

The potato demonstrations have shown results of treatment, but they have nothing marvelous, since the potato this season has been an unusual crop.

Silos are growing in favor very rapidly in Boyd county. There have been seven erected this season. The total number now in the county is twenty-one.

A summary of the work done is as follows:

Total number of demonstrators	41
Total number of demonstrations	65
Total number of visits made	426
Total number of interviews	152
Total number of letters written	383
Total number of miles traveled	2,936

Supervised the vaccination of 1,531 head of cattle against black-leg. More than one dozen syringes have been purchased as a result of the work. More than 400 head of cattle have been vaccinated by the owners.

I have never vaccinated the second time for any man, and only in a few instances have I made the second visit to instruct them in the work.

The introduction of the Government method of vaccination has saved the farmers of Boyd county \$250 in vaccine alone, not counting anything for the cattle saved.

I have inoculated 36 head of hogs against cholera. This is only a few hogs, but when you consider that the inoculation saved one man \$250 in hogs, it means something.

The one big thing that I have been working on is to secure a creamery for Boyd county, and when this is accomplished, I will feel that my services have amounted to something—we will have it before I let up.

I have organized three farmers' clubs. Have attended five or six meetings of various kinds, mostly teachers' meetings, and given talks in the interest of the Boys' Club work. We have a lime spreader in the county as a result of the work. Have used 35 tons of acid phosphate, when there had been only a few hundred pounds used prior to my coming into the county.

In conclusion, I want to say that the people of Boyd county have shown hearty co-operation both from the farmers and the people of the towns; without this, of course, the work would have amounted to nothing.

G. C. RICHARDSON,
County Agent.

CHRISTIAN COUNTY.

In compliance with your request for a report of my work in Christian county, I have the honor to present the following account:

Upon arrival at Hopkinsville, Tuesday, September 7th, after a four days' trip by automobile from Maysville, my former headquarters, having encountered rain for two days of trip, and some other difficulties, I immediately got in touch with Judge Wm. T. Fowler, President of the Crop Improvement Committee, and other members of the committee, and Mr. B. G. Nelson, State Corn Club Agent, talking over the situation with them, and getting all the information I could obtain.

The day following I had the opportunity of meeting a great many of the farmers, business and professional men at work on the roads, this being "Good Roads Day." I am greatly indebted to Mr. B. G. Nelson for his assistance in accompanying me up and down the different roads, and presenting me to the workers.

The policy of meeting the citizens of the county was continued, and with that end in view the business men, county officials, and others were visited with the idea that it was advisable to establish my identity, and to serve notice on the people in a personal way that I was on the job, and ready to serve them in any way that I could.

As superintendent of "Agricultural Exhibits" at the Pennyroyal Fair, I scoured the country for exhibits of corn, tobacco, fruit, vegetables and live stock, with the result that we had the best agricultural exhibit ever put on at this fair, as evidenced by enclosed clippings. Again I was indebted to Mr. B. G. Nelson for accompanying me on these excursions, and profiting by his suggestions, succeeded in locating many good exhibits.

A special effort was made to get the Corn Club Boys interested in the fair, and to select corn for exhibit at the State Fair and at our county fair. As a result of this activity, one of these boys won first premium at the State Fair for Western Kentucky, and \$20 in money, and on showing this same corn at the local fair won \$25 in money, and first on single ear and on ten ears. Encouraged by his son's success, Mr. W. T. Keatts made some selections for exhibit, and won first premium in the adult class.

Fair week was a busy time for me, as the arrangement of exhibits, interviews with farmers, advising with exhibitors about their show stuff, and meeting the people generally, consumed the entire week.

I visited the State Fair in the interest of Christian county, securing a registered pig as a premium for the Christian County Pig Club boys, from a breeder in the northern part of the State, Mr. Thos. Powers, of Crittenden, Kentucky.

Through my efforts one of the large breeders of Durocs has agreed to give every Pig Club boy entitled to consideration a registered sow pig.

Work with hogs has been given some attention, having vaccinated two herds with splendid results from the first herd treated, and the second herd to hear from.

The special work that I have been doing has interfered with starting the regular routine of a county agent's duties. I have made long trips to individual farms, at the special request of the owners, and it is my intention to stay several days in the neighborhoods, visiting the surrounding farms while there, as opposed to jumping from one neighborhood to another. A meeting of the Crop Improvement Committee will be called, when a plan of procedure will be presented to them for discussion.

Some time has been given to the collection of data, notifying farmers, business men and others, of the intention of the Secretary of the Department of Agriculture to feature Christian county in the year book of the department, as an example of the co-operative spirit.

The farmers being very busy with their tobacco crop and other farm business, the fair, and other pressing matters, I have not pressed the club work, but have had one meeting talking live stock, less plowed ground, more grass and more manure as a necessity for the economical maintenance of humus and soil fertility.

The people of Christian county are very cordial and helpful. I have made it a point to study conditions, the people, their character, point of view and other matters bearing on the demonstration work, and to work in harmony with the conditions as I found them.

A. M. CASEY,
County Agent.

CLAY, JACKSON AND OWSLEY COUNTIES.

I commenced work as county agent in parts of the counties of Clay, Jackson and Owsley, on September 1, 1914. There being no semblance of interest in scientific farm work; no co-operation, no farmers' clubs; but little pure-bred live stock; no county fairs; no corn shows, school fairs, etc., I at once proceeded to endeavor to arouse interest by making a series of rounds of speakings at public schools, arranging the dates ahead, and with the school superintendent of each county visiting

with me, we succeeded, through the help of the teachers, in getting out several farmers at each point: I furnished all present with Government bulletins, dealing with crops and things that most were interested in, and on the third trip we proceeded to organize farmers' clubs, with the teacher usually as chairman. I supplied these clubs with books and bulletins, and the teacher would have a short program at each meeting, in which boys and girls took a part. I attended as many of these club meetings as possible, and soon had an interest, and by attending all county court days and public gatherings, I found myself swamped with inquiries along agricultural lines. I had most of my demonstrators elected by the club membership to carry out a certain kind of demonstration, and most all have been true to their elective duties. I have been successful in most all of my demonstrations. I have thirteen sweet clover demonstrators, and most plats are showing up well, with the soil well limed, and the indications are that many of them will grow sweet clover. My eighteen red clover demonstrators are well pleased with the results of my instructions. The two alfalfa lots look good now, but time is required to prove its worth here. I have demonstrators on practically all the crops grown in this community, and expect more next year, with better results.

I succeeded in getting three "barrel sprayers" and three barrels lime sulphur-solution and Bordeaux mixture donated to my territory for demonstrating the care of trees and fruit, for which these three counties are noted, and outside the fire-blight, results are good, and many more orchards will be sprayed next season in order to stamp out the San Jose Scale, and other fruit troubles, which are prevalent in most all orchards. I have had five hundred and forty tons (6 cars) crushed limestone distributed and applied to the sour soils, with an echo coming back from all who used it "Give us more lime." Mr. Grant Blair's field of corn, where one-half was fertilized with 1-8-1 goods, and the other half with three tons of lime, the limed half stands a witness for the results of the lime, and lime has taken its place here.

The six clubs that used the lime have also purchased co-operatively their fertilizers, pure-bred stock and field seeds, and all are pleased with the results, and co-operation will be practiced more in the future. The Tyner Club has purchased pure-bred hogs, bulls, and poultry, and out of a membership of forty-eight, only five have refused to discuss publicly any subject assigned to them.

Through the school campaign and farmers' clubs I succeeded in organizing a corn club in each of the three counties, with a total membership of 386, and a large per cent. of said membership has grown its acres of corn, and all the talk now is about the boys' corn plats, and the success they have made. I attended the teachers' institute in each of the three counties, and succeeded in getting committees appointed to draft programs for school fairs and corn clubs, which I am now about ready to carry out, beginning at Booneville, October 8th and 9th, McKee October 15th and 16th, Manchester October 22d and 23d, with a program for the school children as well as corn club boys. With the co-operation of the teachers, we are expecting success with our first attempt, with good prizes offered for all farm products, making a specialty of the crops grown by my demonstrators. We are to have a parade by corn club boys and tomato club girls.

I have traveled two thousand seven hundred and forty-six miles horseback since January 9, 1915, and one thousand two hundred and eighty miles by rail (three hundred and eighty-seven miles were traveled on Sunday, in order to be present on court days). I have attended forty-two farmers' club meetings and special farmers' meetings, and have addressed three thousand and ninety-eight farmers all told. Have addressed on my own appointments forty-nine meetings of boys and girls, with a total attendance of two thousand and ninety-eight. Have made personally one hundred and sixty-four visits to demonstration classes, and have visited and talked personally with seven hundred and fifty-six farmers on farm work. Have had conferences or public discussions with three hundred and eighteen educators in some way or other, and have talked with one hundred and seventy-two business men relative to agri-

culture. Have spent twenty-eight dollars of my own money for printing speaking dates, circular letters and otherwise.

The above figures run from January 9, 1915, when I commenced to keep an accurate record of my work. I have also written five hundred and eighty-eight letters in connection with my work. Have had eighty-seven visits to my office by farmers, and two hundred and ninety-five phone conferences with several other important activities connected with my work left untold. Of all that I have endeavored to do, I think most of the fact that I caused to be erected a twelve by thirty-six foot concrete silo for W. A. Worthington, of Annville, Kentucky, the first of any kind of silo in this part of the mountains, and a curiosity to lots of the people here. When I told Uncle Jim Robinson I was erecting a silo at Annville, he seemed so pleased, and said: "I am proud of it; we will have a closer place to send our people when they go crazy." When we began filling the silo last week, then good expressions came from the farmers—this is only the beginning, they say. The greatest good I have accomplished in my work is the complete demonstrations I am carrying out on my farm, which has been in progress for eight years, and which is a valuable asset to me in my present work as county agent. I have not attempted to give a full account of my work in this short report, but only attempted to give you an idea of the method which I employ in carrying on my work.

W. R. REYNOLDS,
County Agent.

CRITTENDEN COUNTY.

I began work in Crittenden county December 11, 1914. I found here no organizations to direct the work. As the money for my salary was made up here in Marion, the country people knew nothing about it, nor the character of the work. With the aid of the county school superintendent I selected places to organize farmers' clubs. Taking each quarter of the county weekly I organized sixteen such clubs. Through these club meetings which are held at night I have created

interest in the work throughout the whole county, and have secured my demonstrators and co-operators, and organized corn and pig clubs.

We have demonstrations on corn, tobacco, orchards, rape, cow peas, soy beans, alfalfa, rye, wheat, crimson clover, winter oats, barley, strawberries, hog feeding, and cattle feeding.

Cotton seed meal had never been introduced here as feed. Last winter we bought one carload on the co-operative plan, with excellent results. Very little acid phosphate had been used; 14% sold for twenty-one dollars; 16% at twenty-five dollars, on time. Through the Marion Milling Company and farmers' clubs, the farmers have bought ten carloads of 16% acid phosphate at fourteen dollars and sixty cents; and four carloads of ground limestone.

We have undertaken to standardize the cattle in the county, and now have forty Hereford bulls in service.

Have gotten ten men started shipping cream. Have helped in the construction of twelve wood stave silos, two concrete and three home-made ones. Have planned several dairy and cattle barns, some new structures and some remodeled. Have saved several cows that had milk fever, and vaccinated hogs, the first work of the kind ever done in the county, saving 95%.

Have created a good deal of interest in the pig and corn club work, and made a good showing at the pig show held here in Marion August 28th; sent from this show the pig that won second prize at the State Fair in Louisville. I am making the rounds of the county schools and organizing pig and corn clubs for the coming year. Expect to introduce pure-bred hogs in the county through the pig clubs.

I had under my charge one piece of Timothy hay, treated with acid phosphate and harrowed, which cut 8,220 pounds to the acre, cured hay. Also had one piece of alfalfa, seeded in September, 1914, treated with acid phosphate in the spring and harrowed after each cutting, which yielded five tons of cured hay to the acre. Have some good demonstrations on corn, one field planted in five different ways. Would like to give exact

results, but the corn is not gathered. The same quantity of each division will be weighed to determine the results. The treated sections appear to be easily twice as good as the untreated. Am also doing some soil building by using soy beans and cow peas, hogging off and turning under the vines. On a forty-acre field, seeded to peas, we received fifty dollars clear of expenses and turned under heavy coat of vines, this to be followed with wheat, using two hundred pounds of acid phosphate and seeded to grass. Acid phosphate was used on nearly all of the grass and wheat sown this fall. Have succeeded in getting a number of farmers interested in cutting bushes, stopping gullies and cleaning up fence rows. Introduced the Hartig Attachment (for sub-soiling), which will be used on large acreage of corn land this fall and winter. In all cases where we used this method last winter we received good results. This land had been plowed shallow for so long that it had become thin and had poor under drainage, hard-pan having formed from three to five inches under the surface.

We bought large quantities of spraying materials, co-operatively, and succeeded in getting the fruit trees sprayed from three to five times, and have a ten thousand bushel apple crop being harvested as a result, said to be the best the county has ever produced.

The business men of the county say the crop this year had better preparation and received better cultivation than in the past. I have been giving my time to the preparation and working up of a county fair and stock show, to be held in Marion October 29th, to encourage better live stock, and have had to do this with very little help, as it is a new thing here.

Weekly average: Travel horseback 100 miles, visited 40 farmers, distributed 70 bulletins, wrote 8 letters, held 5 meetings, had 12 telephone calls, and talked to 3 schools.

J. ROBERT BIRD,
County Agent.

FLEMING COUNTY.

SUMMARY OF WORK FROM JANUARY TO AUGUST, INCLUSIVE.

Number of miles traveled, exclusive of trips to Lexington in January, and western trip in June, 1,716; number of addresses made, 67; number of people present, 2,948; number of farmers interviewed, 1,792; number of phone calls, 1,184; number of letters written, 329; number of visits made to demonstrators, 137; number of visits made to co-operators, 46; attended farmers' chautauquas three days; had booth at Ewing Fair in which to meet and confer with farmers for two days. I have organized ten farmers' clubs, but at the present time am unable to give the number of farmers enrolled. We also organized the "Fleming County Horse, Jack and Mule Breeders' Association," making the total of clubs organized eleven. In co-operation, we purchased 1,000 bushels of coal at a saving of two hundred dollars; one hundred bushels of sweet clover seed at a saving of twenty dollars; seventy-five bushels of soy beans at a saving of seventy-five dollars; forty-three bushels of cow peas at a saving of twelve dollars; and other field seeds at a saving of thirty dollars. We also bought co-operatively ten spray pumps at a saving of sixty-five dollars and eighty cents; and spray material at a saving of sixty-five dollars. By combining our orders on fertilizer we forced the dealers down on prices, and so saved to the farmers of the county approximately four thousand dollars.

A certain chemical company sent its state agent to see me. He stated in the presence of others that his company had "broken" every county agent in the State, and wanted to know what I was going to do in the matter. This state agent also told Mr. Fay, who was handling fertilizer for another company, that his company had broken every man who cut prices to the farmers, and that they would get him also. Our demonstrations in most instances have proven quite satisfactory. We have convinced quite a number of our good farmers that as a rule in this (Fleming) county it does not pay to purchase so-called complete fertilizer; that most of our soils need lime and phosphorus.

In an effort to bring about a better understanding and spirit of co-operation among the farmers and the citizens of our county seat, we will hold an agricultural fair in Flemingsburg on Friday and Saturday, October 15th and 16th. We have one Boys' Corn Club with a membership of fifteen, and in order to arouse a deeper interest in agriculture among the boys and girls we have designated Saturday as "Children's Day." Many of the premiums will go to boys and girls between the ages of ten and eighteen years. A chapel organ will be given to the country school district having the largest per cent. of its census enrollment in attendance at the fair on the sixteenth.

I am fully persuaded that if we are to permanently improve the agricultural conditions, it must be through the young people on the farms.

W. H. CLAYTON,
County Agent.

FRANKLIN COUNTY.

I submit below a brief statement of the work done in Franklin county, Kentucky:

I was ordered to report for work on April 15, 1915, and upon arriving in Frankfort I was met and introduced to the farmers who were in town that day and to a number of the merchants and other business men. Desiring to get in touch with the farmers as soon as possible, the next morning I went with Mr. E. M. Armstrong out through the northern part of the county, and found the men whom I met very hospitable and ready to fall in line with the work.

Realizing that it was too late for my work to have any material effect on the majority of the crops then growing, I determined to try to gain the confidence of the people first of all, and thus be in position to work to the best possible advantage with them on the crops for the fall and winter. This I attempted to do by going to the various farms, becoming acquainted with the men and offering timely suggestions concerning the various problems that confronted them; by meetings held at different

places over the county for the discussion of farm problems, and by visits to the schools where talks were made to the children to interest them in corn club work and farm life in general.

Since assuming the duties of county agent I have made 321 visits to farms, held 12 farmers' meetings, mailed and distributed 112 bulletins, written 110 letters of a business nature, and have been called to see a number of sick animals. At the first call of this kind received, a horse was reported sick, and with Mr. Geoffrey Morgan, who was with me that day, I went to see the animal. We found a bad case of tetanus, and suggested that a veterinarian be called and antitoxin administered. This was done and the horse recovered, and the owner is one of the most staunch friends I have.

About June first many of the merchants of Frankfort received letters written from Louisville, signed by L. E. Stockard, in which an attempt was made to belittle the work of the county agent, and a number of false statements were made, among them the statement that the agent was attempting to make worse the relations between merchant and farmer, that he was advising the farmer not to trade with the local merchant, and that he advocated buying from mail-order houses. Immediately upon my return from the trip to Bowling Green and Hopkinsville, I went to see the merchants who had received these letters, and explained the situation to them, and assured them of my intention to do all possible to improve the condition of the existing relationship between merchant and farmer. Just at that time a movement was on foot to organize a Business Men's Club, and after receiving permission from the district and state agents, I helped to perfect the organization, became better acquainted with the business men, and was elected one of the eight directors of the Frankfort Chamber of Commerce. Since that time I have attempted to draw the country and city nearer together, and to make the country people see that the town people are their friends, and need them, and to make the city people realize that they must have the co-operation of the country people in

order to make Frankfort the city it should be. In this way I have been to a great degree successful.

During the summer I devoted my time and attention to impressing upon the farmers the necessity of returning plant food to the soil in the various ways, and of sowing winter cover crops, instead of allowing the land to lay bare in the winter, as many have previously done. I found that many were attempting to grow alfalfa, and that some were successfully growing it. In the majority of cases either absolute failure or a poor crop had resulted from seeding land not in the proper condition, where lime was needed, and from not inoculating the soil; but in some cases the farmers had been successful because care had been taken in preparing for the crop, and because lime was present in the soil, mainly where hill-sides were seeded after great quantities of rock had been removed. At the present time more alfalfa is growing in the county than ever before, and more men have cover crops, crimson clover, rye or some other crop growing on their fields than at any previous time.

In June an outbreak of hog cholera was reported on one farm, but not until nearly a week after the hogs were noticed to be off feed, and about four days after the first animal died. When the herd was seen it was evident that most of the hogs were affected, but all were given the serum alone treatment, and about one-third of them were saved. I immediately notified the men on the surrounding farms of the outbreak and advised that their hogs be given the treatment. This was immediately done by the county agent, and not an animal on any except the farm where the outbreak occurred ever showed the least signs of the disease. Prompt measures and the co-operation of the farmers prevented its spread, and saved the people of the county thousands of dollars.

At the present time attention is being devoted to urging upon the farmer the necessity of careful selection of seed from the field for next year's corn crop, and to the organization of Boys' Corn and Pig Clubs for 1916.

It is planned to have a meeting of the retail men of the city about the 18th or 20th of this month, at which State Agent Geoffrey Morgan will be present, and out-

line to them an effective plan for a systematic method of co-operation between them and the farmers, and it is my sincere desire to see the plan put into operation, which no doubt will be done within a short time.

Respectfully submitted,

RUFUS H. FELTS,
County Agent.

GALLATIN COUNTY.

Beginning the work of county agent in Gallatin county, Kentucky, on January first, 1915, my first two days were spent in studying the instructions governing the work of county agents, studying bulletins and writing two newspaper articles on the work of the county agent, and another on "The Corn Crop in Kentucky," and in arranging mailing lists of farmers suitable for demonstrators and co-operators.

From January fourth to ninth, inclusive, I attended the conference of county agents held at the College of Agriculture, at Lexington, Kentucky, receiving information for my work from State and districts agents.

My next work was that of securing demonstrators and co-operators for the different crops, and arranging for the organization of boys' corn clubs and pig clubs.

I have induced twenty-five farmers in the county to spray their fruit trees for eradicating the San Jose Scale, and I find that in every case the trees were greatly benefited, and in most cases the scale is entirely eradicated. We used the commercial lime-sulphur solution, and found it to be thoroughly satisfactory. In the work of spraying I had the assistance of Dr. J. H. Carmody, of the Experiment Station, who was with me two days, and held two field meetings, and gave an evening lecture besides visiting several individual farmers who were interested. Quite a number of the farmers of the county have decided to pay more attention to fruit growing, and will follow the full season spray next year. I have two demonstrators who have used the full season spray on apples, and the result is an abundant crop of fruit of excellent quality. I find that the fire-blight has affected all of the pear orchards, and the greater part of the apple orchards of the county, and have had in-

quiries from farmers as to the treatment. I explained the cause as per the directions of the State Experiment Station, and recommended the pruning and the destruction of the affected branches.

We have had some valuable demonstrations in the growing of crimson clover, as to its different uses. One plat of four acres was used as pasture for hogs and cattle, and afforded the best early pasture to be seen in the county. This plat was afterwards turned under, and planted to rape for hog pasture. Another plat of crimson clover was cut for hay, and made a yield of two tons per acre, the hay being cut just as the clover began to bloom. This plat was turned under May 15th, and planted to corn which will yield seventy bushels to the acre.

There has been sown fifty acres of crimson clover in the county for cover crops and soil-building, as the result of two demonstrations. I have urged the use of leguminous crops for the restoration of soil fertility, and have had quite a number of successful demonstrations in sweet clover, red clover and soy beans. Our demonstrators have been only partially successful with alfalfa, owing to the extremely wet season, which made it practically impossible to keep the spring-sown alfalfa cleaned from weeds and crab-grass.

Those demonstrators who have been able to keep their alfalfa plats clean have grown splendid crops; some of them cutting as many as three crops from April sowing. All alfalfa demonstrators used the inoculating culture prepared by the Department of Agriculture at Washington, D. C. The fall sowing of alfalfa has done exceedingly well in the county this year, and quite a number of those who failed on the spring sowing, have splendid crops of alfalfa now growing on the same plat. I have paid special attention to inducing farmers to sow cover crops this fall. Crimson clover and rye seem to be the best for us here.

Very little commercial fertilizer is used by the farmers of the county, and I have recommended the use of home mixed fertilizer in preference to the ready-mixed. One of my demonstrators in tobacco used a fertilizer of four hundred pounds of acid phosphate, 16%, and one hundred pounds of nitrate of soda to the acre,

with splendid results. This demonstration showed an increase in the crop, and a saving on the cost of fertilizer as compared with the use of a ready-mixed tobacco fertilizer used last year on the same type of soil. Six new silos have been constructed in the county, two at least through the influence of demonstration work. I have two good demonstrations in dairying. Both demonstrators have filled their silos for winter, and are feeding alfalfa and soy bean hay for roughage, and use balanced rations for grain feeding.

In the work of my demonstrators in corn I have urged the deep breaking of the land, good preparation of seed beds, and frequent shallow cultivation, which instructions have been followed as nearly as possible, with good results. On account of an extremely wet season there has been some difficulty in keeping the corn crop cleaned from weeds and grass, and the number of times of cultivating the crops has been lessened, but the season has been such that we have the greatest corn crop in the county that we have seen for several years.

I have three demonstrations in hog feeding, one of which is the dry lot plan, and two the forage plan. These demonstrations are doing fine. In the dry lot demonstration a balanced ration of grain is used with soiling from green alfalfa and clover. In the forage demonstration we are using rape, oats and cow peas, and feeding down corn in the field. I have made one demonstration in Sudan grass, which has shown that it can be grown here with very little expense, and will make a good hay crop. Our demonstration plat consisted of three-fourths of an acre, planted May 11th; two crops of two tons each were harvested and found to make excellent hay, especially for horses.

One demonstration in millet shows a yield of three tons of hay per acre at a cost of about three dollars per ton for production. A demonstration in sorghum for feeding dairy cows shows excellent results.

A brief summary of the work done in the county up to October is about as follows: I have twenty-six demonstrators, some making demonstrations in two or more crops, and twenty-six co-operators. Have organized a Corn Club of one hundred members, and a Pig Club of thirty-one members. Of the Corn Club members about

sixty will be able to make good reports, and I hope to get at least twenty-five good reports from the Pig Club boys. I have distributed several hundred bulletins among the farmers, bearing on most every subject and phase of the work that would be of interest to them; have devoted one hundred and sixty-five days to the work, and am at present securing demonstrators for next year, securing data for crop reports, and organizing club work among the boys of the county.

Respectfully submitted,

J. R. McDANELL,

County Agent.

GRANT COUNTY.

From November 11, 1914, to October 2, 1915, or 45 weeks.

The agent has traveled a total of 2,860 miles on the road by buggy or motorcycle and 1,160 miles by rail. He has made 305 visits to demonstrators and 366 visits to co-operators; 128 telephone calls; 545 interviews and consultations; written 426 letters; 409 packets of bulletins, circulars, etc., mailed; 13 articles for newspapers; taken part in 24 meetings with a total attendance of 1,508. He has vaccinated 80 calves for black-leg.

The agent is conducting 68 demonstrations with 40 demonstrators, of which 6 are with corn, 11 with acid phosphate, 11 with alfalfa, 3 with crimson clover, 6 with sweet clover, 2 with vetch, 4 with cow peas, 5 with soy beans, several with pulverized lime; 1 with cottonseed meal as fertilizer; 9 in the spraying and care of orchards; 3 in dairying, and 5 in miscellaneous.

Before the coming of the agent no acid phosphate had been used in the county—this year over 20 tons were used at the suggestion of the agent, and it is safe to foretell the buying of several carloads next year because it is more effective on Grant county soil than complete fertilizers costing ten dollars a ton more.

Under the encouragement of the agent an increased interest in pure-bred dairy cattle has developed, particularly in the whole southern part of the county. Along with 28 dairymen the agent visited some dairies of Pendleton county and the result has been the purchase of

registered stock by several, particularly registered Holstein bulls.

Under co-operation of the agent, alfalfa ground has been more carefully prepared, sweet clover more widely sown; orchards sprayed and apples of a fine quality have been produced from a half dozen of these sprayed orchards. The county farm orchard was sprayed under close direction of the agent and gave better fruit than had ever been produced there.

Interest in better seed corn and wheat and alfalfa is evidently following propaganda of the agent, and the Corn Show last fall. New varieties of alfalfa, the Grimm and Orenberg, are under test in the county.

Six corn club boys turned in record books. The corn boys' ten ear sample exhibits at the State Fair won two prizes, a first and a third.

The county agent has visited many schools of the county and has gained the co-operation of a number of the teachers in teaching the children many things about the farm.

D. H. FULLERTON,
County Agent.

HENDERSON COUNTY.

In January, 1914, I became County Agent in Henderson county, Kentucky. My first work, after I had surveyed the field here, was with orchards, spraying and pruning. During the first few months of my work I pruned trees in forty orchards and sprayed in fifty, and then in the spring at planting time I succeeded in planting four new orchards. In the fall of 1914 I assisted the fruit growers with their exhibits at the State Fair, where fifteen first and six second ribbons were won. In November of 1914 all the prizes secured and all the work pertaining to the fruit and corn show was done by the county agent, and the fruit show was pronounced by the judge to be the best ever held in Kentucky. In the Wine-sap class there were twenty entries.

In 1914 two hundred and thirteen acres of alfalfa, fifteen acres of crimson clover, twenty acres of alsike, seventy-five acres of winter oats, eighty acres of red clover, ten acres of vetch and rye, fifty acres of crimson

clover and rye, one hundred and twenty acres of cow peas, and one hundred and ten acres of soy beans were planted under the direction of the county agent. There were only two failures out of twenty-eight with alfalfa, and both of those were spring-sown plots.

In 1914 six silos were built through the influence of demonstration work. All of these were concrete.

In July, 1914, the farmers and business men here were requested to write to the proper authorities and ask that an experiment to control and eradicate hog cholera be carried on in Henderson county. The appeal was granted and about six thousand hogs have been treated up to the present time with only a small loss. Serum and veterinarian services are free to the farmers who have infected herds. In 1914 the county agent sold to the farmers of this and adjoining counties ninety thousand cubic centimeters of hog cholera serum made by the State, the serum depot being under the county agent's charge.

In 1914 eighty-two farmers' meetings were held, with a total attendance of about 3,086 persons. Twenty-one schools were visited. In all, four hundred and ninety-six miles were traveled by rail, and three thousand two hundred and eighteen by team. Minor demonstrations were also conducted in stump blowing, drainage, corn cultivation, apple packing, seed selection, tobacco cultivation, liming, lawns, truck gardening, strawberry raising, home gardening, milk testing, hog feeding, poultry raising, concrete work, and Boys' and Girls' Club work. Thirty-one improved implements were bought in 1914.

In 1915 one hundred and fifty-six acres of alfalfa, forty-eight acres of crimson clover, eighty acres of peas, one hundred and four acres of soy beans, seventy-five acres of red clover, twenty acres of winter oats, sixty acres of barley, twenty acres of rape, and twenty-five acres of sweet clover were planted in demonstration plats. Active assistance was given in organizing a new agricultural fair, which was a decided success. The State Farmers' Institute was held here, the total attendance for the three days being about 3,000 people, and the institute was pronounced by the Commissioner of Agricul-

ture and the members of the State Board of Agriculture to be the best in point of attendance and interest ever held.

During Farmers' Week at the Experiment Station the fruit exhibit collected by the agent won bronze medal, and two blue and two red ribbons were won in corn.

At 1915 State Fair eighteen first and thirteen second ribbons were won in exhibits collected by and in charge of county agent.

Six new silos were built due to demonstration work. Three carloads of acid phosphate and about thirty carloads of limestone were bought. Boys' and girls' club work was carried on, and fifteen pieces of improved machinery were bought.

P. D. BROWN,
County Agent.

HOPKINS COUNTY.

It seems when I first went to Hopkins county to take up the work of county agent that the time for this work was premature, for the business men and not the farmers were the ones interested. I realized that if I made the work a success, as I was determined to do, I must interest the farmers as well as the commercial interests.

Taking up the work in the autumn, when the schools were in session, I very often visited them and left dates to meet the farmers there some evening, and discuss farm topics with them. Some of these meetings were well attended, and some were otherwise. Advice had come to me that each county agent was expected to have about thirty demonstrators in growing corn. Being enthusiastic, this seemed too few men, so I enrolled one hundred demonstrators, and here I made a mistake, for it was impossible for me to visit them as often as I should.

The first spring we bought one car of fertilizer, co-operatively. This was a small amount, but it served the purpose, showing the farmers they were paying extravagant prices for fertilizers. The following fall we bought two hundred and fifty tons, co-operatively, of 16% acid phosphate, thus saving the farmers not less than \$2,500. Prices ranged in the county from \$22.50 per ton for 16% acid phosphate to \$27.50 per ton for 14% acid phosphate.

I was instrumental in helping save the farmers about \$7,000 in fertilizer the two years I was there. This, however, was not the most important fact. They are now buying the plant food which is most needed, and leaving off the more expensive and less necessary ones.

We had a live poultry club, a good corn club, and a splendid pig club. All three of these were of inestimable value, as they gave the boys and girls the work they were interested in, and proved to their parents that they were not getting the best returns for their efforts. This phase of my work was very enjoyable, as it brought me in close contact with the boys and girls. Who can say that it is not more helpful to start a youth out with the right idea of doing things, as he has not yet reached the valley of fruitful life, than to change the man who has but little to look forward to, and a wide expanse of the past to reflect on.

To help those who need helping gives one a joy that cannot be had from any other source. Last spring I learned that a number of men had canvassed the county selling fruit trees, with very unreasonable claims for them, and when a number of farmers came to me to see if I could not help them out of this swindle, it was my pleasure to scheme with them and find a way out. We went to a reliable law firm, and they advised us that there was no way out as the contract bound them to pay 50% of the sum specified, in the event the contract was broken. We sent a man up to the place where the supposed marvelous nursery was located, and found they had no nursery at all. Their Winesap and Jonathan apple trees were being grown without budding or grafting. To make a long and very interesting story short, we cancelled about \$1,300 worth of orders.

We held two farmers' chautauquas, which were a complete success in every way. Many people commenting upon the live stock exhibit, said it beat anything they had ever had at the county fair. The special feature of the live stock exhibit was that of Hereford cattle. The big white-faced cattle attracted the attention of all. In this special locality we have aroused so much interest that in the past two years more than forty head of Herefords have been purchased. The interest in breeding

pure-bred hogs has been stimulated to such an extent that it was impossible to keep an account of the number brought in. The demonstration work has created a wonderful lot of interest in improving the breeds of all kinds of better live stock. Such a thing as vaccinating hogs was practically unknown in Hopkins county when I went there, but after a few demonstrations in infected herds, it was not hard to convince the farmers that it was an economical and sure preventative against hog cholera. This work became so popular that it was necessary to establish a sub-serum station in the county.

It is said that more fruit trees were pruned in Hopkins county the past spring than in the ten preceding years. Mr. Carmody, with his enthusiasm and knowledge, deserves praise for his splendid assistance in this work. I was occupied for six weeks spending from one hour to a half day with farmers showing them how to prune trees. Many spray pumps were bought, and farmers began to fight their old foes. The splendid fruit tells a story which many will profit by.

Some twenty cars of crushed limestone were bought co-operatively, and a few acres on many farms were sprinkled over. In several instances this showed no results, but it was on account of too low a humus content. Sweet clover, however, on very poor soils showed a luxurious growth where the lime was spread, and where no lime was spread only a few scattering stalks were to be found.

Soy beans, crimson clover, sweet clover, and alfalfa were four legumes practically unknown in this county, but in two years' work we had many farmers growing them. It was a pleasant sight in May to drive along and see fields of crimson clover in bloom. A little later in the season a fresh mown plat of alfalfa could be found at considerable intervals. It was a common sight to see alternating rows of corn and soy beans which would soon be ready for hogging down. In the fall the hum of the bees could be heard in the sweet clover fields, which two years previous were wasted hillsides, void of vegetation.

With these crops I am sure I did more good than with all my other work combined. Hopkins county is not naturally a fertile county. The problem of building

these soils is a great one, but I feel that with the use of these legumes I have pointed out to the farmers a means by which it can be accomplished. The appreciation of the farmers after they have once made a success with these crops, and their expression of gratitude makes you glad you are a county agent, and can be instrumental in helping some one to see a gleam of better things ahead.

When I took up my work in Hopkins county the Fiscal Court would give us no financial aid. The second year they voted \$300 to my work, and the third year they gave all they were asked to. This shows the attitude the county now has toward the work. To say that I am proud to have once been a county agent does not express my feelings. Sometimes the tasks were hard and the work discouraging, but the co-operation I received from the farmers, and the courtesy with which I was treated both by them and the business men, far overbalanced all these hardships, and I would rather have been county agent in Hopkins county for two years than to have done any other work. There is real wholesome joy in helping those who need and appreciate your services.

CHAS. L. TAYLOR,
County Agent.

JACKSON, ROCKCASTLE, GARRARD, ESTILL, AND MADISON COUNTIES.

Upon entering my work on August 20, 1914, I found a great field spread out before me, consisting of parts of Jackson, Rockcastle, Garrard, Estill and Madison counties. I realized there was much to be done; and the responsibility rested upon me, and I did not know who would co-operate or how I would be received by the farmers.

Being personally acquainted with Mr. Montgomery, my predecessor, and of all the work he had done in this territory, I felt my inability to continue his work and to introduce new things.

After traveling over my territory one time, which took about three months, getting acquainted with the list of demonstrators and co-operators handed to me by Mr. Montgomery, my courage was strengthened and my faith increased.

During my first year, ending Aug. 20, 1915, I had 56 demonstrators. I have today, Oct. 9, 75 demonstrators of crops. I have recorded on my mailing and instruction list over 500 co-operators and demonstrators combined.

In all my work I have never met any opposition. The people I have dealt with—farmers, business men, lawyers, doctors, ministers, teachers and professors—have all received me with courtesy and welcomed me into their homes. I feel I have their hearty co-operation and influence in my work, to the extent of better farming and more scientific agriculture. Of course, there are many people in my territory who do not carry out the instructions given them, and the reason is, as I see it, they have not demonstrated the truths, which they have learned through scientific farming.

I have at present 6 good strong Farmers' Improvement Clubs. Every one of these has been the result of a demonstration or a good rousing farmers' meeting in every community. I have introduced through these clubs pure-bred stock, such as bulls, boars, bucks and poultry. Through these clubs I have also secured in some sections crop rotation, farm book-keeping and quite a lot of drainage and more and better farm machinery.

I have not been able to meet all the demands or to answer all the calls in my territory. I realize that through these clubs already organized and those which I intend to organize within the next month, that a great deal of the farming spirit and enthusiasm will come.

I find that where a demonstrator has actually demonstrated and proved to the people what could be done through scientific farming that there is no trouble to get others to do the same, either directly or indirectly.

During my work as county agent I have distributed thousands of bulletins and have written thousands of letters and postal cards. And I find that in most of the homes where this literature goes they are anxious to get and read it.

I have done quite a bit of work through the public schools in my territory, along the line of school fairs. These I have found to be very valuable in influencing the farming and educational spirit in the community.

My 75 corn club boys from different sections of my territory of this year and last, have been boys from the rural schools. It is through these boys that better corn growing has been brought before the older farmers. For instance, in one case six corn club boys produced their corn at a cost of 27c per bu., while their fathers' cost them 37c per bu. This is only one case out of many. Out of the corn club I had one boy to win free admission to the State Fair this year, 1915. This same boy won \$5 in the corn judging contest.

In the spring of 1915 I organized a Pig Club consisting of 25 members. At our Berea Fair—which is the Madison County Fair—13 pigs were exhibited, contesting for \$25 prize money put up by the fair board. One boy of this club had so cared for his pigs that he won \$10.50 cash out of the \$25 offered. He also won free admission to the State Fair. It is through this Pig Club that I have been able to show to the farmers the value of raising pure-bred hogs, at a smaller cost than it requires to grow an inferior grade.

The many farmers' meetings, school fairs, farmers' institutes, chautauquas and field meetings have been of inestimable value, recognized by the farmers themselves.

Last year I was able to have an agricultural fair at Berea—my headquarters—which was attended by more than one thousand people. The home, garden and farm products were exhibited in abundance. This meeting seemed to have aroused such an interest that the farmers have demanded and called for another to be held this year, in 1915, October 30th. We have all reasons to believe that this one will be better than that of last year.

I called Mr. Rickey, our State Poultry Agent, to my territory, and we organized a Poultry Club, consisting of over seventy members. This club exhibited at the county fair this year and won many prizes. They also exhibited at our agricultural fair.

Then, through my influence, more than one thousand stumps have been removed from cultivatable fields and more than one hundred orchards pruned, and more than thirty sprayed; old fields have been cleaned up and put to serving their owners; more grass has been started to growing, and I have introduced cow peas, soy beans,

rye and Sudan grass in the mountain part of my territory. I started this year a number of plots of alfalfa, which are doing well at the present time. I have also been influential in building a number of barns, cow sheds, cribs, poultry and hog houses.

With what has been done it only has seemed to open up the field to greater responsibilities and greater improvements. I am working now to the end where I can see my territory all organized into farmers' clubs, each club having representatives, which will come to Berea, the center of my territory, and there organize a central organization—each one of these rural clubs having a phone so as to be in connection with the central organization.

I am convinced that such an organized territory and such telephone system will bring about better rural conditions and better citizens of our Commonwealth.

R. F. SPENCE,
County Agent.

JEFFERSON COUNTY.

February 1st, 1914, to December 12th, 1914.

DISTRIBUTION OF WORK.

Demonstrators—

Work was carried on with 68 demonstrators, with 237 demonstrations of all kinds having a total acreage of 4,259 acres.

Co-operators—

Work was conducted with 127 co-operators having an estimated acreage of 3,126 acres.

Summary of Work—

(1) 193 farmers were visited in the interest of the demonstration work from February 1st to December 12th.

(2) 220 interviews and consultations were held at the office.

(3) 463 visits were made to demonstrators.

(4) 12 meetings of the Crop Improvement Club were held at the Commercial Club rooms with an attendance of 560 persons.

(5) 47 night meetings were held at school houses at various points in the county with an attendance of 2,368 persons.

(6) 3 night schools were conducted with a total of 15 sessions with an attendance of 218 persons.

(7) 5 field meetings were held with an attendance of 245 persons.

(8) 8 out-of-county meetings with an attendance of 580 persons.

(9) 23 schools were visited during the year, but no record of attendance was kept.

(10) 908 letters were written in the interest of the demonstration work.

(11) 2,552 circular letters were sent out pertaining to demonstration work.

(12) 4,370 post card notices were sent to Crop Improvement Committees.

(13) 1,402 telephone consultation calls were received, which were in many instances as long as a personal interview.

(14) Assisted at one Farmers' Institute, two sessions, with an attendance of 155 persons.

(15) Assisted at two Farmers' Chautauquas, six sessions, with an attendance of 3,000 persons.

(16) Making a grand total of visits, consultations, institutes and chautauquas of all kinds, 994.

(17) Making a grand total of 7,239 persons reached through the above meetings.

(18) 20 articles for the county paper were written during the year.

(19) Judged farm products at county fair.

SUMMARY OF DEMONSTRATIONS.

(1) Corn—7 demonstrators with a total of 190 acres.

(2) Alfalfa—52 demonstrators with a total of 263 acres.

(3) Crimson Clover—9 demonstrators with a total of 54 acres.

(4) Red Clover—5 demonstrators with a total of 167 acres.

(5) Sweet Clover—16 demonstrators with a total of 540 acres.

(6) Rye—29 demonstrators with a total of 643 acres.

(7) Wheat—11 demonstrators with a total of 221 acres.

(8) Soy Beans—10 demonstrators with a total of 189 acres.

(9) Potatoes—3 demonstrators with a total of 72 acres.

(10) Rotations—5 demonstrators with a total of 1,200 acres.

(11) Orchards—6 demonstrators with a total of 232 acres.

(12) Lime—65 demonstrators, a total of 1,922½ tons, a total acreage of 470 acres. Ground lime rock was used.

(13) Dairying—2 demonstrators with a total number of 60 cows.

(14) Beef Cattle (feeders)—3 demonstrators with a total of 350 head.

(15) Hogs—12 demonstrators with balanced rations with 1,200 head.

(16) Woodruff's Soil Fertility Experiment with a total of 18 acres.

(17) State Fair Association Experiment Work. (a) Corn Fertilizer Experiment Work; (b) Soy Bean Variety Test; (c) Cow Peas, Lime and Fertilizer Experiment Work; (d) Hog Feeding Demonstration.

(18) Boys' Corn Club with an enrollment of 16 members. Edward Gallrein won the State prize, growing 144 bu. on his acre.

(19) Boys' Second Crop Potato Club with an enrollment of 22 members.

OTHER CLUBS.

One Farmers' Agricultural and Improvement Club, namely, the Auburndale Improvement Club, was organized during the year and at the present time has a membership of 150 members. A recent outgrowth of the

above club was the forming of a Woman's Auxiliary Club, the members being wives of the men of the above mentioned club. These clubs conducted a Farmers' Chautauqua Oct. 25, 26, 27, and on November 5th organized a Farmers' Night School, which meets Monday and Friday night of each week.

In addition to the above the county agent has co-operated with the St. Matthews Produce Exchange, which is the strongest local organization of potato growers; the Buechel Exchange, which contains many very successful second crop potato and onion set growers; the Middletown Produce Exchange composed of potato, strawberry and tomato growers; and the Orchard Grass Seed Association, which is practically the center of the orchard grass seed industry of the United States.

TRAVEL.

- (1) 1,145 miles were traveled by rail.
- (2) 7,494 miles were traveled by machine.
- (3) 8,639 miles were traveled by both rail and machine.

January 1st, 1915, to October 9th, 1915.

DISTRIBUTION OF WORK.

Demonstrators—

Work was carried on with 88 demonstrators, with 239 demonstrations of all kinds having a total acreage of 4,224 acres.

Co-operators—

Work was conducted with 121 co-operators having an estimated acreage of 2,876 acres.

Summary of Work—

(1) 171 farmers were visited in the interest of the demonstration work from January 1st to October 9th, 1915.

(2) 358 interviews and consultations were held at the office up to October 9, 1915.

(3) 477 visits were made to demonstrators up to Oct. 9th.

(4) 5 meetings of the Crop Improvement Club were held at the Commercial Club rooms with an attendance of 292 persons.

(5) 55 day and night meetings were held at school houses at various points of the county, with an attendance of 1,824 persons.

(6) 1 night school was conducted with a total of 11 sessions with an attendance of 380 persons.

(7) 4 field meetings were held with an attendance of 77 persons.

(8) 1 out-of-county meeting with an attendance of 125 persons.

(9) 28 schools were visited up to October 9th.

(10) 1,036 letters were written to demonstrators and co-operators.

(11) 4,694 circular letters were sent out pertaining to demonstration work.

(12) 2,857 post card notices were sent out pertaining to meetings.

(13) 2,175 telephone consultation calls were received.

(14) 1,687 bulletins and circulars were mailed.

(15) 468 hogs were inoculated with the serum alone method.

(16) Assisted at one Farmers' Chautauqua, three sessions, with an attendance of 1,050 persons.

(17) Making a grand total of visits, consultations and chautauquas of all kinds, 1,175.

(18) Making a grand total of 3,838 persons reached through the above meetings.

(19) 6 articles for the county paper were written during this time.

(20) Judged farm products at county fair and K. E. A. meeting.

SUMMARY OF DEMONSTRATIONS.

(1) Corn—26 demonstrators with a total of 325¾ acres.

(2) Alfalfa—30 demonstrators with a total of 175 acres.

- (3) Wheat—24 demonstrators with a total of 396¾ acres.
- (4) Potatoes—9 demonstrators with a total of 144½ acres.
- (5) Soy Beans—6 demonstrators with a total of 92 acres.
- (6) Cow Peas—8 demonstrators with a total of 51 acres.
- (7) Crimson Clover—5 demonstrators with a total of 29 acres.
- (8) Rye—21 demonstrators with a total of 312 acres.
- (9) Red Clover—15 demonstrators with a total of 266 acres.
- (10) Orchards—3 demonstrators, total of 155 acres.
- (11) Lime—52 demonstrators, total of 1,434½ tons, total acreage of 336 acres.
- (12) Rotations—6 demonstrators with a total of 1,368 acres.
- (13) Dairying—7 demonstrators with a total number of 201 cows.
- (14) Beef Cattle—5 demonstrators with a total of 260 head.
- (15) Hogs—6 demonstrators.
- (16) State Fair Association Experiment Work: Alfalfa.
- (17) Boys' Corn Club with an enrollment of 26 members. The boys of this club won \$75 in prizes at the State Fair.
- (18) Boys' Pig Club with an enrollment of 15 members. Thirteen of these boys exhibited their pigs at the State Fair and won \$70 worth of prizes.
- (19) Made 62 visits to the boys of the several clubs.
- (20) Soil Fertility Experiments—W. F. Woodruff, 18 acres; George Long, 36 acres.

TRAVEL.

- (1) 1,129 miles were traveled by rail.
- (2) 5,982 miles were traveled by auto.

F. E. MERRIMAN,
County Agent.

KENTON COUNTY.

When I undertook the work of County Agent for Kenton county the first step taken along demonstration lines was the formation of a Kenton County Farmers' Improvement Association, or Crop Improvement Association, in the organization of which I had the assistance of Mr. Geoffrey Morgan.

I then began working with the farmers in every way I could. At that time it was mostly pruning and spraying fruit trees, and testing out soil for acidity, also having some analyzed by the Agricultural Experiment Station.

Besides the central organization, I have formed four other clubs which meet once a month. These clubs were organized on a business, educational and social basis. I have been having the farmers and local men take part on the program as much as possible, yet I have always made a talk at each meeting. One object is to try to make the farmer have a good time and saving a dollar while he is doing it, yet always dealing with the local merchants, if possible. A few of the purchases made by these clubs are as follows:

One carload of acid phosphate.

One carload of ground limestone.

Two carloads of coal.

On all things bought there was a saving to the farmers; on the acid phosphate there was a saving of \$120 on the one car. Another car of coal is now ordered, and orders are being secured for two cars of rock phosphate and two cars of Portland cement.

I have made talks on: Pruning and spraying of fruit trees; the value of co-operation and club work; testing of seed corn; management of fields to prevent erosion, selection of seed corn; treatment of seed wheat for smut; soil fertility and other similar topics.

I have helped to trim and spray four orchards, and consulted with perhaps one dozen more on the same subject.

I have selected a number of fields for alfalfa. It is not such an old crop here, and certain fields are much better adapted to it than others.

I have tested perhaps one hundred samples of soil for acidity or the need of lime.

I planned one dairy barn, helped to plan one stable, two combination horse and dairy barns, and the remodeling of one tobacco barn into a dairy barn. Consulted and planned with farmers on the location of soils, building of milk houses, and laying of concrete floors and drain ways in old dairy barns.

In soil fertility work, have been running tests and demonstrations with sweet clover, cow peas, soy beans, crimson clover, rock phosphate, acid phosphate and nitrate of soda.

Helped to work on plans for beautifying county infirmary grounds, Ryland Country Club and a few lawns.

Organized a Boys' Corn Club of 24 members, but all of them will not finish with the year, for the fields of some were drowned out, and some could not get the land. However, some members have worked faithfully.

Have made talks at church convention on the country church, addressed County Teachers' Institutes on agriculture in country schools, and on the organization of corn and pig clubs.

I got the farmers and business men to back a proposition of a sub-experiment farm in the county, and the Fiscal Court agreed to donate two thousand dollars for the purchase of the land for the use of the Agronomy Department. Have interviewed farmers on practically every subject imaginable along agricultural lines.

WAYLAND RHOADES,
County Agent.

KNOTT COUNTY.

Since I have been agent in Knott county I have carried on demonstrations with forty-nine men and have one hundred and six co-operators. It is very difficult to get complete records, owing to the high percentage of illiteracy among the farmers.

The mountaineer is very conservative, and I have not succeeded in organizing any farmers' clubs among them.

Owing to the bad condition of roads, it is impossible to get people out at night, except in one or two communities. I have held twenty-nine meetings, including

some field demonstrations, with an average of about forty present, or a total attendance of thirteen hundred and seventy-seven.

I have made one hundred and ninety-two visits to co-operators, three hundred and thirteen visits to demonstrators, and seventy-four visits to other farmers. Two hundred and ninety-three persons, including members of the Boys' Corn and Pig Clubs, have visited me in my office. I have been present at twelve conferences of local co-workers. I have answered eighteen telephone calls.

I have spent considerable time in trying to control hog cholera, which is alarmingly prevalent. I have found it difficult to persuade the farmers to vaccinate their hogs, mainly because of lack of funds; however, I have vaccinated sixty-four hogs, and instead of letting carcasses lie in the creeks, or wherever they happen to die, as they did when I came, the owners now burn them.

I have written six hundred letters, seventy-eight cards, and sent out thirteen hundred "Special A Bulletins" and circulars, besides distributing more than seven hundred on my rounds through the county.

Not more than one out of fifteen farmers takes a paper of any kind.

I have conducted five spraying demonstrations, and we now have ten spray pumps in my territory, where there were but two. Nine hundred and seventy fruit trees, most of which were young, and sixty-seven grape vines were pruned in demonstrations.

Corn growing has been practiced in this section to the exclusion of all other crops. A few scrubby cattle grow on a corn and fodder ration, being the only live stock product sent out of this section. I have made every effort to improve the live stock and to encourage the growing of forage and grain crops, and have met with partial success. Twelve Duroc Jersey hogs, one O. I. C. and two Tamworths have been brought in. We have two Shorthorn bulls old enough for service, and four under consideration for purchase this fall. None of these are registered, but are of good blood. These are practically all the pure-bred animals in the county. We have more than doubled last year's acreage of clover

and grasses; more than fifty bushels of cow peas were sown this year, not more than twenty last year; the acreage of oats was increased about one-fourth, and about twice as much rye was sown as a cover crop as was sown last year.

I had thirty-two boys enrolled in the Corn Club, but only seven are finishing the work. Considering their handicaps and opportunities, they are doing well. Have five Pig Club boys, and one boy from each club won a trip to the State Fair.

The County Superintendent of Schools has given me permission to do what I want to, and can, in the schools, but he does not agitate club work nor any other line of work.

In performing my work I have ridden horseback and walked fourteen hundred and thirty-three miles, traveled one thousand and eighty-five by rail, and one hundred and sixty-five by auto. This last and most of the railroad travel was done on our trip to Western Kentucky.

HORACE E. McSWAIN,
County Agent.

KNOX COUNTY.

On Feb. 1, 1915, I was appointed County Agent of Knox county, Kentucky. Since that time I have devoted my entire time to the work. When I became agent there were only four cultivators in the county, now we have one hundred and twenty-eight. At that time there were only three or four herds of pure-bred hogs in the county, and now we have increased this number to about fifteen. I have vaccinated something like two hundred hogs, and have not lost one that I have treated. I have had the people to clean up their premises, use plenty of lime, burn all hog beds and dead carcasses, and at this writing there is no cholera in the county, the first time in several years we have been free from the disease. I met with the officers of the First National Bank Tuesday, October 12th, and asked them to buy, as an advertising matter for them, ten Duroc-bred gilts for the county, in the place of buying calendars and other stuff as advertisements—the bank to give these gilts out to ten farmer boys, then to have these boys give the bank

two pigs out of the litter of each gilt, which would give the bank twenty pigs instead of ten gilts; then give these pigs to twenty more farmer boys, requiring the boys to give two pigs out of each gilt to the bank. On and on the bank in turn to give them to the farmer boys, which will be the greatest advertising scheme the bank ever put on.

I also showed the bank how these pigs could be shown at the county fair, and that it would be a great advertisement for them. I told them I would organize the boys' Pig Club through the county, and make the boys care for the pigs the bank gave to them, and in four or five years this would be something the bank would be proud of, and also have the country stocked with pure-bred hogs.

I had the farmers to order three good Hereford bulls and two Jersey bulls into the county. I met with the National Bank of John A. Black Wednesday, in regard to buying four good Hereford bulls for the county. The bank appointed a committee to confer with the other directors and stockholders in regard to making the purchase. I showed this bank where they could buy these bulls as an advertisement, and be out no more than they are for calendars and the like, and in buying these bulls, would put more money in the bank by putting a better grade of cattle in the county. Number the bulls from one to four, and change them every year, and in four years we could almost have pure-bred Herefords in the county instead of scrubs. I also showed the banks where they could in four years call those bulls in, and sell them for as much money as they gave for them, and place four other bulls in their place, and in eight years we could have pure-bred Herefords all over the county. I also showed where the farmers could get \$25 for a Hereford calf, when they can only get \$10 for a scrub. So it would double the farmer's deposit in the bank.

I was chosen by a committee of citizens of the county to go to Mt. Vernon to confer with other delegates from adjoining counties, Whitley, Laurel, Bell, Clay and Pulaski, in regard to what steps to take to secure good roads in the county. I was their chosen delegate of three to get up plans and speaking dates for same,

which I followed up until we took a vote on the bond issue of \$200,000, which carried 7 to 1 in the county.

We have had our road surveyed four different ways to adjoining counties, Whitley, Clay, Bell and Laurel, and we believe we have enough money to build a good pike to each county line. I was asked by the County Judge, as County Agent, to go to Frankfort and represent the taxpayers of the county in trying to get a raised assessment of \$16,000 off the county, which the State raised the county. I was successful in getting a little over \$8,000 off the taxpayers of the county.

Peas.—There have been more peas growing in the county this year than ever before. This was the first time farmers ever used inoculation for peas. They knew nothing about it until I became agent for the county, and they are well pleased with the success of the undertaking. They can tell to a row where the inoculation went. Twenty-five farmers in the county used it this year.

Sweet Clover.—We never had sweet clover sown in this county until I became agent. There have been fifteen different crops sown this year. All of it was inoculated and is looking well. There has also been sown about twenty crops of crimson clover. All is inoculated and looking good at this time. There has been more rye and oats sown in this county this fall than has been sown in any one year for the past ten years.

Soudan Grass.—We have a plat of Soudan grass in this county that has been cut three different times this year, and it makes more hay to the acre than any other grass we grow. I believe it to be a good grass for this section. We have a few crops of alfalfa, but not looking well.

Irish Potatoes.—There have been more Irish potatoes grown in this county than any one year for several years, also more sweet potatoes. There has been an enormous crop of vegetables grown in this county this year, such as beans, cabbage, tomatoes and other small stuff.

Fruit.—We have sprayed this year some five or six thousand fruit trees, and find it to be a great thing, as this has been the first year there has been any spraying done to amount to anything. This is a great strawberry section. Doctor Burnsides is a demonstrator on straw-

berries and tomatoes. He has five different plantings of strawberries, the plants on one plat I ordered for him this spring. The name of the strawberry is "Progressive." I visited his place on the tenth of October, and we picked a quart of ripe berries and saw lots of green berries on the vine. I believe they will bear until freezing weather kills them. He is also the tomato king of the county.

Corn.—John A. Black, president of the National Bank of John A. Black, one of my county demonstrators, sowed soy beans on a plot of 25 acres in 1914, and turned it under about twelve inches deep in September. He then sowed a plot in rye, and on May 15, 1915, about the time the rye started to head, he rolled it down with a roller, and cut it up with a cutaway harrow, and turned it under about ten inches deep, and then sowed broadcast about two hundred pounds to the acre of acid phosphate 16%; then cut, harrowed and rolled the land until he got a good seed bed, and then planted the land with a corn drill about the 25th of May, and gave the corn three shallow cultivations. I believe we can gather seventy-five bushels to the acre. The adjoining land to this plot, under the old way of cultivating, will not average over twenty-five bushels to the acre. Zeek Wyrick, another corn demonstrator, on a plot of twenty-five acres wet-natured land, which had never raised over ten bushels of corn to the acre, in 1914, turned it about ten inches deep, and opened up some ditches and sowed it in peas, and turned the peas under in the fall twelve inches deep. In the spring of 1915 he cut, harrowed and rolled until he had a good seed bed. Then about the first of May he planted his corn with the drill, and using as a fertilizer one hundred and fifty pounds of 16% phosphate acid, and fifty pounds 41% cotton seed meal mixed, making two hundred pounds per acre. I believe he will raise sixty-five bushels of corn on this land. The land adjoining this plot will not average over ten or fifteen bushels of corn per acre.

I have sixteen Corn Club boys in the county, who are cultivating one acre each. Their yields will average from 65 to 100 bushels of corn per acre. The banks put up \$75 for the corn show at the Knox County Fair, and my Corn Club boys won \$65 of the money. Shively

Shelton, one of my Corn Club boys, was the fourth best boy corn judge at the State Fair. There have been ordered in this county since I became agent fifteen hundred eggs of pure-bred poultry of different breeds; consequently we are getting several nice flocks of poultry started in this county. We have had two good stallions brought into the county, one German coach stallion, and one standard-bred saddle horse.

W. M. TYE,
County Agent.

LAWRENCE COUNTY.

I began work as County Agent in Lawrence county on March 9, 1914. Only a few people in the county knew that demonstration work was being provided, and there was not another county agent within one hundred miles. We have a poor sandy soil, badly worn, the farms are not well fenced, the live stock is not well bred, and my first effort, therefore, was to create confidence in farming of any kind, and then in improved farming.

During April and May I arranged for several demonstrations with corn, and a few with cow peas. I found it necessary to deal with the individual, for there was no organization of any character among the farmers, and roads were very bad, and people not acquainted far away from home.

During the summer I made a survey of the live stock in the county. There were just a few pure-bred cattle, but their performance was good, and was closely watched by the general public. I answered many questions relative to the different beef breeds, and finally made it so clear to a few men that registered shorthorns were well enough suited to our conditions that men asked me at once where such cattle could be purchased, and at what price. I went to Mount Sterling and selected a small herd. The individuals proved good, and other farmers have since purchased bulls and cows from Blue Grass breeders. Several Lawrence county farmers have purchased bulls from their neighbors who started in the pure-bred business a year ago. Two of the purchases were the results of farmers' meetings held in log school houses. In one community there had never been any

pure-bred live stock, and there was no one able to invest one hundred dollars for a bull. A company of eight men was formed, and a calf purchased from one of our county breeders is proving to be a splendid investment. The owners are changing from the all-corn system to some cow peas, clover and winter oats. I am assisting them in selecting the best seed possible for these new crops.

There was one silo when I arrived, and we now have six. Each silo owner is an enthusiast on the subject. These men will use cotton seed meal this year for the first time. One dairyman near Louisa used cotton seed meal with such success that his neighbors all know about it. I am now helping this man purchase his first pure-bred sire.

I found that we have more dogs than sheep and hogs together. I have three demonstrators with green crops for hogs. These men have shown conclusively that hogs can be produced at a profit in Lawrence county. The contention is that "hogs cost more than they come to." They are usually kept in a pen or bare lot and fed corn. I used dwarf Essex rape and cow peas for pasture. There are no scales to determine just what the gain was, but the people are pleased with what they see. I have helped to establish two breeding herds of swine.

Much attention has been given to the care of these better bred animals, and I have treated a large number of diseased farm animals. Until I arrived cattle died on nearly every farm from black-leg and diarrhea, and cows from milk fever. Sheep died from stomach worms, and hogs from cholera. I have treated every case promptly, and with painstaking care. So far I have not lost a patient I attempted to treat.

I introduced crimson clover into each section of the county, and this fall fifty acres of corn ground was seeded to this cover crop. Three small plats of sweet clover, and two of tall oat grass, and four of winter oats, succeeded so well that we now have these crops on a dozen different farms.

We used our first lime and phosphate last year. I explained the use of these elements more than one hundred times before it was possible to take any orders. We have been greatly benefited by these object lessons, for

every crop that received an application of limestone or phosphate showed an increased yield. I am often asked: "Can you grow alfalfa here?" The crop has been attempted in every community, but never with any success. I helped a lady farmer seed four acres as it should be. The effort was a great success. This year this woman's husband seeded ten acres just as he had learned from last year's work.

I found a decided prejudice against the Boys' Corn Club—two men in two years' time had spent energy in agitating the work, but had failed to develop the boys into profitable corn growers. The organizations developed into political machines, and there was a bad after effect. I have made it a point to do individual work with a dozen boys. They are increasing the yield in their respective communities, and they will be the source of building up an effective organization some day.

I have caused pure-bred seed corn to be used in every section of the county, but I am most pleased with my work in changing the farmers from growing corn to growing cowpeas. A large number of farmers have learned from me that the best way to "bring land to" is to sow cowpeas in summer and rye in winter, turning under the rye for a summer crop.

Last February I made it clear to the citizens of Louisa that we would have a much better county if the good housewife was provided with scientific instruction relative to gardening and home-making. I have emphasized the work of our Home Demonstration agents whenever possible, and as a result we have a good interest in vegetable and fruit gardening. We have shown conclusively that marketable fruit can be produced when the spray pump is correctly used.

Within the last few months I have effected an organization of business men that we think will be permanent, and accomplish much needed work.

Just now we are working on a permanent location for our county fair. Other things to promote the county in an agricultural way will be taken up in season. For years past the men who have shown the most interest in the county improvement work, are the men who are re-

garded by our substantial citizenship as men "broken down" in their particular lines. We are trying to grow into an organization, instead of going into one.

E. S. KEGLEY,
County Agent.

LAUREL COUNTY.

On the morning of March 24, 1915, I began the work as official County Agent of Laurel county, Kentucky. The county was fortunate in getting an agent who had never been spoiled in the work, and the agent was fortunate in getting a county who knew nothing of the rubs of the county agent's harness. Here a stranger, among strangers, a man in a new work, beginning a new work to the county, I took up my duties as county agent. To begin with, I was kept rather busy answering all kinds of questions, some, I think, for the sake of curiosity, and a little test of my farm knowledge; others I noticed were actually followed up, proving that they were asked for the information. The Superintendent of Public Schools, Mr. J. M. Feltner, had advised the farmers to use clover and acid phosphate, which, in answer to inquiries, was heartily endorsed by me, and as a result within a few weeks' time four carloads of acid phosphate, and three of ground limestone (as a starter of clover) were distributed among the farmers. The cost of acid phosphate was reduced from \$21 to \$15 per ton, the limestone cost us \$1.60 delivered.

I found that fruit tree pruning was not a common practice, and that spraying was a lesson yet to be learned; so I started over the county giving pruning demonstrations, telling of the value of spraying, and the possibilities of fruit grown under such conditions as nature had blessed us with. As a result of my talks six men were persuaded to spray their trees. At the county fair I overheard the remark by different people concerning a certain display of apples: "Those apples never grew in Laurel county." I went to the clerk and asked who the apples belonged to, and I found that they were grown by Chas. Pierce, one of the men who had sprayed his trees in the spring. A few weeks ago I visited another one of the men, and he said to me: "Morgan, the

apples in the orchard that I didn't spray are all falling off, and I am feeding them to the hogs," while the other orchard was loaded with perfect red apples, and I believe that I put half of the apples that I found on the ground in this orchard in my coat pocket to eat as I went on my way. All the demonstrators, as well as the neighbors, say that such nice apples never grew in the orchards before, and as a result the demand for spray pumps is so great this fall that we thought it wise to start a young man out with the agency for a well selected pump, in order that the people may have the best.

To carry out our soil feeding idea, I selected a few men to demonstrate the growing of legumes, and the results that could be obtained by the use of acid phosphate. I had six men using acid phosphate on different crops, and comparing them with crops grown without fertilizer, and also with those grown with the complete fertilizer; and seventeen men growing some one of the different legumes, such as crimson clover, sweet clover, cow peas, soy beans, alfalfa and peanuts. Alfalfa treated with rock phosphate and ground limestone, sown October second, is now, October 26th, ten inches high, and the stand is perfect. Soy beans yielded as much as 6,020 pounds per acre, as compared with 2,460 pounds cow peas. Cow peas have been grown successfully in this county before, but to our surprise in all the demonstrations the beans gave more than twice the yield of that of peas under similar conditions. The yield of oats grown with acid phosphate was fifty per cent. more than that grown with the complete fertilizer in the same field. Corn yields have been increased from twenty-five to one hundred per cent. by the use of acid phosphate and sub-soiling. As the result of these demonstrations eight carloads of this fertilizer were used on the fall sown crops,

As the season for the different kinds of farm work came on, I visited all the points where people manifested most interest, and discussed the problems with which they were wrestling at that time. The interest was so great in some places that we were prompted to organize local farmers' clubs, for the purpose of meeting at regular intervals and discussing farm problems. During the year sixty-three of these meetings have been held,

with an average attendance of forty-five people. About April the 15th hog cholera began its devastating work, and some of these meetings were called for the purpose of devising some plan whereby we could eradicate this dreaded disease. At ten such meetings we had a veterinarian from the State Experiment Station to give us information on the subject. On April 19th I began my work of vaccinating in infected and suspicious herds. To date I have vaccinated 66 herds, with a total number of 400 hogs, and up until last week I had not lost a hog from cholera that was well at the time of vaccination. Last week three died that were vaccinated more than four months ago, June 15th, the immunization having expired.

At a local club meeting a few nights ago the farmers decided to ship a co-operative carload of potatoes. I will leave today for the mining camps at Pineville to sell the potatoes.

About midsummer we decided that strawberries would be a profitable crop for us, as the rate of \$800 per acre had been realized in the county; but after a few weeks' work, we found that the people were not ready for the kind of co-operation that would be necessary to successfully grow and market strawberries. Now we have a movement on foot to bring into the county a carload of pure-bred Shorthorn cattle, to be used for breeding purposes, and thereby stock up the county with a better grade of cattle.

The county had its first Chautauqua and also its first school fair this year. The Chautauqua was a fair success, even though not attended by more than one hundred and fifty people daily. The school fair was a great success. The entries numbered 65, being composed of all the common farm and garden products, displays of cooking and sewing, canned goods, fancy work, carpenter work, maps and written work. About \$100 was given in prizes partly by the Board of Education and partly by the business people of the town. The worth of a dollar or more was given to each pupil winning a prize, and twenty-five dollars was offered for the school winning the greatest number of individual prizes. It was said by business men and traveling men that the exhibits excelled any that they had ever seen at any

county fair in the State. We are planning to have an exhibit at the State Fair next year.

Laurel county up to the present time has not been a farming county, but the timber and coal supply is now exhausted, and the people are beginning to really awaken to the scientific principles of farming. The county is in no sense the richest county in the State, but after seeing and testing its products, we are forced to believe that it has the best foundation soil for fruit and vegetable production of any county in the State. She has a great future in supplying the mining camps of our neighboring counties with their daily food, and all that is needed to make her one of the richest and most desirable counties of the State is to have, along with the completion of her pikes, a few more wide-awake people to fall into the ranks of fruit and vegetable growers, with those who are already interested in making the county the garden spot of Kentucky.

SAMUEL MORGAN,
County Agent.

MERCER COUNTY.

The task you have given me of outlining the work done in Mercer county since being County Agent is a hard one. However, I will do my best. I have tried to do such work as would save the farmers most money and convert the greatest number of them to demonstration work. I have made a fight on hog cholera that has made us many friends and saved the county thousands of dollars. One old negro whose hogs I vaccinated said to me (months after): "Boss, if it hadn't been for you I would have lost every hog I had." I have vaccinated five thousand two hundred and twenty-seven hogs (5,227); I have vaccinated three hundred and fifty-nine cattle for black leg; I have treated 151 other animals. I have inspected all stock shipped from or into Mercer county since Sept. 12, 1914.

Next in importance has been my work in soil building. We have built 23 silos, four cattle barns, and six combination barns. We have built three concrete silos, two of them sixty-five feet high. We are saving hundreds of tons of manure annually which is showing al-

ready in increased crops. We have two hundred acres of soy beans, (our farmers are well pleased with soy beans); we have at least two hundred acres of alfalfa and most of it is a success; we have one hundred acres of sweet clover, which is giving satisfaction; we have a good many cowpeas; we have sixty acres of crimson clover; all of which will add many dollars' worth of nitrogen and humus to our soil and help solve our fertility problem.

Next in importance has been my work in horticulture. I have ten orchards under demonstration, which are giving great satisfaction. Nothing that I have done has made us more friends according to the number of people interested than my work in the orchards of Mercer county. We have a corn demonstration that has attracted a great amount of attention. We used 150 lbs. of nitrate of soda per acre on this corn and more than doubled the yield. The corn was put in silos. We had a soy bean demonstration which the farmers went for miles to see; it was on tired land. There was 40 acres in soy beans; we inoculated two bushels of seed with liquid culture from Washington, and sowed a strip through center of field; this strip will make twice as much hay as the beans on either side. It was full of nodules while the rest of the field had none; until recently it has begun to inoculate itself. We have soy beans in corn following soy beans that are eight feet tall (*Ito San*). We have ten acres of soy beans following hairy vetch and rye that is as pretty as any crop could be; we have ten acres of soy beans in same field following crimson clover and rye that is not near so good. Last year we plowed a 40-acre clover field 8 inches deep and run subsoiler 5 inches deep, planted it to corn, plowed it six times shallow with Planet Junior cultivators, raised about seventy bushels of corn, followed it with wheat and raised 35 bushels and 43 pounds per acre. We increased the yield of tobacco at least 300 pounds per acre with 150 pounds of nitrate of soda on one demonstration. We have one demonstration of cow peas following hairy vetch and rye that is fine. Cowpeas to be turned under and ground to be planted to tobacco next year.

We have organized seven beef cattle clubs; two or more farmers go in together and buy a registered bull;

they all get the use of him and usually get most of their money back and sometimes all of it when through with him. We are filling our county with a better grade of cattle. We have imported a number of registered hogs and a few registered sheep. All of our beef cattle club bulls were shown at our county fair, and most of our registered hogs, sheep and horses. We are importing some registered dairy cattle. We are going to have more stock, better stock and richer land.

I had only four boys who actually raised their acre of corn. I have twenty-three ready for next year, however, and I think I will have a nice Corn Club. I have assisted the county agent in every way that I could with the Canning Club work.

We have laid between four and five thousand feet of drain tile, and have ditching machine at work now. We have about 1,000 acres of swamp land that we are reclaiming. We have six stump pullers in the county, and have pulled the stumps and grubs of many acres and are making those acres produce good crops.

While I haven't done as good work as I might have done had I been better prepared, it was my best, and I believe the work successful.

J. C. GENTRY,
County Agent.

METCALFE COUNTY.

In obedience to your request, this office submits the following brief outline of work:

First, dealing with the soils; deep tillage; subsoiling; better seed beds; use of cover crops; legume culture; crop rotation; a system of diversified farming; prevention of erosion; drainage; reclamation; intensive rather than extensive farming; high-grade fertilizers; use of barnyard manures and crushed limestone.

Second, better bred live stock, including poultry; better draft horses, mules, beef and dairy cattle, sheep and swine; if possible on every farm, eliminate scrubs and mongrels.

Third, home vegetable garden, including fruits; home canning; home industries; provide for the home the home requirements, thus eliminating much of the expense in high cost of living.

Fourth, provide forage crop and permanent pastures in a system of diversified farming, including stock breeding, feeding and economic management.

Fifth, better roads (not very much done yet).

Sixth, conserving the forests; forest planting.

Seventh, removing stumps and boulders.

Eighth, better home conveniences; water systems; farm equipment.

Ninth, club work; Boys' Corn and Pig Clubs; Poultry and Canning Clubs.

Tenth, building silos; demonstrations in feeding roughage and concentrated feed stuffs.

Eleventh, better selection of seed for farm use.

Twelfth, planting, cultivating, pruning and spraying fruit trees.

Thirteenth, developed spirit of co-operation, unity, harmony, pleasant rural conditions, emphasizing schools, clubs, telephones and churches.

Fourteenth, a system of records or farm bookkeeping (not much accomplished in this yet, but slowly being adopted).

Fifteenth, good literature—bulletins of both the State and United States Departments of Agriculture. Good agricultural papers, journals, magazines, etc.

Sixteenth, home improvements—paints, white-washes, ornamental trees, shrubs, grass, flowers, lawn making, etc.

Seventeenth, home, school, semi-public and public sanitation, importance of conservation of the health and life of the human subject and live stock as well.

Demonstration work in this county consists of land (soil) improvements, deep plowing, use of clover crops, legume culture, red clover, sweet clover, crimson clover, cowpeas, soy beans, alfalfa, spraying and pruning fruit trees, introduction of better bred live stock, use of silos, use of crushed limestone, better seed selection (importing seed in many instances), high-grade fertilizers, drainage, removal of stumps and boulders, much better farm equipment, corn, pig and poultry club work. Canning work is also good.

The work has been much retarded, because of drought causing heavy loss to seed, clover and grasses

in a system of rotation in both 1913 and 1914, and much seed perished (or young plants) in 1915, in early part of season. This fall has been better in this respect.

Corn, wheat and tobacco demonstrations this year as a rule are poor, because of excessive rains, beginning the latter part of May.

P. W. BUSHONG,
County Agent.

MONROE COUNTY.

The farmers co-operative demonstration in Monroe county, Kentucky, is making toward a better system of agriculture. This action is slow, but it is none the less sure. No furore is being created nor wild promises being made, for the fertility of the soil must be raised before farming can be profitable.

In the beginning of the work it was not deemed advisable to organize any co-operative society independent of an order then at work in the county, and it was through this order that most of the co-operative extension work has been done, although some of my most progressive people are not in its ranks. We have been successful in all of our deals in fertilizers, kerosene, salt and field seeds. Membership grows continually, and with new co-operative bodies being formed, the county will soon be in shape to do a great work next year.

In the summer when my work began, stress was placed upon the proper cultivation of corn, but with the unusually wet season, intensive methods could not be carried out to the letter. Good results, however, are apparent on the uplands where it was possible to carry these methods out.

The late summer was given over to forage and hay crops. As the result of the extension work, more red clover has been sown than has been for years. Enough nitrifying bacteria has been furnished by the Government to inoculate about twenty bushels of seed. The February seeding will be a record breaker, too.

The ground seeded to alfalfa will perhaps total ten acres. Where instructions were observed closely, all obtained fine stands, and at present ground is practically covered. Others intended sowing, but could not get the

soil in the proper tilth in time to comply with requirements in regard to seeding dates recommended. .

Crimson clover is also being tried out. Where the culture was used, good stands have been obtained. The culture's benefit appears to be in or to have resulted in a higher germination, and although I have never seen any statement to bear this out, I am nearly convinced that such is the case.

Only one plat of vetch has been sown to my knowledge, and its appearance is favorable.

Sweet clover will come in very strong in spring planting. It will be sown in most cases with orchard grass, and used for pasturage. It reaches the height of from six to twelve feet here, and its future is assured.

The widest attention is being given to winter oats, and I think it is well, for the yield is good, and it prevents a large area from becoming a thicket of sasafra. They also supplement the corn crop at a strategic moment. Corn is depended upon too largely. This is caused as a result of the upland farmers trying to pattern after the people who live in the creek bottoms, whose lands lie on a Cincinnati or Trenton formation, and yield very high. Barley will get a hearing next year.

Unusual care has been given to the preparation of seed beds this fall, and as it is so general, the extension work can not claim all the credit.

My work in spraying has shown beyond question that the use of Bordeaux for "black rot" is the only way to successful fruit raising. Cedar rust causes a lot of damage, and as a result cedars within two or three hundred yards of orchards are being sacrificed. Will put out some fruit trees in November, in dynamited holes, a powder company having offered to donate the explosives.

Two pure-blooded hogs (Durocs, Defender's strain) are known to have been brought into the county as the result of extension work.

"High prices for sheep" have been working with me, and everybody is a buyer of stock ewes. With some good blooded sires, southern Kentucky is an almost ideal place for stock farming.

Ground limestone is being given a thorough trial. Some near agriculturists have left the wrong impression as to its value and I have to right the error they have made, for it cannot be a permanent cure-all. Crushed limestone prices were reduced to people sowing alfalfa through the efforts of the County Agent.

The use of a phosphorous fertilizer is being recommended, as it is our second limiting factor (nitrogen being the first). The eastern half of the county is using it entirely. The "Coals" are to be carried to the western part this winter. Excellent results are being obtained from the use of a 16% acid phosphate. Potash and nitrogen cannot be missed when not used. The fertilizer item above will save the county hundreds of dollars yearly.

At the invitation of the Superintendent of Schools, I made a short talk to the Institute; also I am allowed all the time I need at the Teachers' Association meetings that are held in the county. Teachers are interested, and helped when asked to do so, some keeping a pig near the school grounds that is fed from the lunches, etc., and the proceeds of its sale is to be the foundation of a school library.

One difficulty I encounter is to get as many promises to keep records as I should like to have. Advice is taken readily when it does not incur any great expense. Practicable has been a word that could be associated with every proposition that I have tried to demonstrate or hold forth.

The sign and moon farmer is still with me, so is the ultra smart man who is out "to stall" the teacher in getting him to account for some queer isolated freak of nature which was probably an illusion after all. But his day has nearly passed, and we are going to succeed him with a farmer who does not only co-operate brains and labor, but who is a social unit, citizen and a brother to his farmer brethren.

E. C. PALMORE,
County Agent.

MUHLENBERG COUNTY.

Possibly the first thing that I did after my appointment as County Agent, was to get the farmers in a certain community together, where there was no postoffice within 8 miles, and ask through petition the Post Office Department at Washington to establish a rural delivery, or start a route through this section (some of the men at this meeting said that they had to go ten miles to get their mail). Within a very short time, possibly four months, these same men had their mail delivered at their door daily, where before they got mail twice a month, and occasionally once a week.

At this time there was only one mail route out of Greenville, today there are five. I have assisted the farmers in securing all of them, and one hundred and twenty to one hundred and fifty-three farmers are served with mail daily on each of these routes.

I had last year five farmers who grew, under my direction, more than one hundred bushels of corn per acre.

We established three fields of sweet clover, the first ever sown in this county. There has been purchased through my influence twenty-three registered cattle, sixteen bulls and seven heifers; twelve registered hogs have been bought at the same time, through my influence.

I have organized or assisted in organizing two farmers' telephone companies, and one hundred and sixty-one farmers are now getting telephone service because of these organizations.

There have been many fields cleared of stumps by use of dynamite, through my influence (136 big stumps in one field). Built 9 silos, four in 1914 and five in 1915. Dug one public ditch, three and one-sixth miles long; drew plans for and helped locate five stock barns for farmers. I have organized six Farmers' Clubs in various parts of the county, the members of which now buy their fertilizers in car lots (co-operatively); one club bought one car of field fence at something like 75% of retail price.

I helped three farmers this year repair their old grain binders (which had been set aside as no good);

these men harvested their crops with these machines and say that they can cut another crop or two with them.

Helped to organize a Good Roads Association that has built and repaired 29 miles of dirt road through some of the roughest parts of this county; it is now considered one of the best dirt roads in this section.

I have helped to organize a farmers' union, known as "The American Society of Equity," that now handles practically all of the tobacco, sheep wool and lambs produced in this county (at satisfactory prices to the farmer). This organization has today 85% of the tobacco of this county in the pool.

I have started several crop rotations for the coal companies of this county. One of these, the Duncan Coal Co., partially through my influence has built and furnished a two-room house, one to be used for the purpose of holding night school which is now being held two nights of each week with an attendance of from 12 to 37 men and women from 22 to 51 years of age; the other room is furnished with library tables and chairs, where men and women can go and read at will in the evening. This is free to everyone.

I have sprayed tobacco for horn worms, potatoes for blight, watermelons for bugs, orchards for scale, and cows for flies. Treated wheat and oats for smutt and potatoes for scab; wheat for weevil. Vaccinated hogs for cholera, cattle for black leg and treated sheep for stomach worms.

I have sown alfalfa, crimson clover and red clover; inoculated seed for all legumes (obtained better results with it); six fields of red clover sown in August this year all stand fine. I have arranged for continuous hog pasture (winter oats and rape, spring oats, cowpeas and soy beans, also clover).

I visited public schools in all parts of the county, addressed the pupils, attended teachers' meetings and institutes of all kinds, have been in conference with business men for the betterment of the rural communities. I have organized boys' corn clubs, community corn clubs and boys' pig clubs.

We are now at work trying to organize a live stock growers' association. I have assisted several men in se-

curing live stock to grow on shares, these men had pastures and feed, but not enough money with which to buy.

I have talked to farmers more trying to get them to build up their land (make it rich), than any other one thing. They are beginning to take better care of their manure and sow more cover crops.

I have gotten several men to feed cattle for market, thus feeding the grain and hay on the farm.

A. Y. FINLEY,
County Agent.

OLDHAM COUNTY.

As County Agent of Oldham county, I beg to submit the following report as to the work done since November 15, 1914, to date:

The first step taken was the organization of Farmers' Clubs, said organizations having for their purposes better farm production, better means of securing farm supplies, better marketing facilities and the study of farm problems.

A central organization was formed at LaGrange, which consisted of County Judge, County Attorney, each magistrate from their respective districts and two representatives from each district.

Lack of interest by the members of this organization necessitated its discontinuance. However, local clubs were formed throughout the county, numbering five in all, with a total membership of perhaps some hundred and fifty farmers.

Forty-three meetings have been held by these organizations at which time I was present taking active part. The following meetings were held with lectures by experts: Five (5) on hog cholera control; two (2) on horticulture; two (2) on soil building; four (4) on how to grow 100 bushels of corn per acre; two (2) on alfalfa; one (1) on dairy improvement, and one (1) on canning clubs.

Two (2) Farmers' Club picnics were given. One by "East End Farmers' Club," which had as their guests of honor the business men and merchants of LaGrange. Some two hundred and fifty people were present, and talks on co-operation were made by the club President, Judge S. E. DeHaven, and State Agent Morgan.

Buckner Farmers' Club held a picnic in conjunction with the Sunday school of that place, with some one hundred and fifty people in attendance.

Organization of "Boys' Corn Club," consisting of seventeen members, all of which have kept an accurate record to date with the exception of two. The boys held club meetings for the purpose of studying methods of corn culture activities. The officers of this association consisted of a President, Vice President and Secretary. Two meetings of the club have been held to date, and were conducted with the same dignity required by any organized body. After the organization of the Farmers' Clubs, one of the first steps taken, and a very important one for this county, was the discussion of "soil fertility" and "fertilizers."

After a study of the soil conditions in different sections of the county, I found a greater part of the soils were deficient in humus, signifying a shortage of nitrogen, also a great deficiency in phosphorus, but all soils, practically, contained an inexhaustible supply of potash. Also the soils of the greater part of the county were very strongly acid, showing a deficiency of calcium carbonate, and the need of ground limestone rock to restore their normality.

"CORN DEMONSTRATIONS."

Knowing soil conditions by study and observations, it was evident the best of results were not being obtained on general field crops from the use of complete fertilizers. Therefore, I secured some thirty men to demonstrate the use of 16% acid phosphate on corn, with a total of about two hundred and ninety acres, and results from these demonstrations show that complete fertilizers are neither so economical nor conducive to permanent fertility as acid phosphate.

"COWPEA AND SOY BEAN DEMONSTRATIONS."

While these two legumes have not been extensively grown in this county, many farmers are growing them, but have not appreciated the value of inoculation where first time grown.

Fourteen demonstrated the use of inoculation on cowpeas with a total of forty acres, and seven demonstrated inoculation of soy beans, with a total of approximately eighty acres. Not all of the material was secured from the government, but some was bought from commercial houses at a reduction to demonstrate its value.

These demonstrations speak for themselves. In one case the yield in growth was more than doubled.

“RED CLOVER DEMONSTRATIONS.”

It has been very difficult to secure a stand of red clover, where sown with a nurse crop in the spring, although this year has been an exception. Nevertheless, eleven have sown about ninety acres this fall without nurse crop, and while the soil is already inoculated for red clover, we inoculated with artificial cultures just the same, to find a difference, if any, by introducing a new supply of bacteria on the supposition that it will increase nodule formation.

“CRIMSON CLOVER DEMONSTRATIONS.”

Very little crimson clover has been grown in this county, and its value as a winter cover crop is known to only a few. Seven men have sown some fifty or sixty acres in corn, and specially prepared ground, all seed inoculated.

Corn blown down by high winds kept a larger acreage from being sown.

“ALFALFA DEMONSTRATIONS.”

Very little alfalfa has been grown successfully in the past because of lack of proper preparation and treatment. Twenty-one men have sown a total of seventy-three acres, according to government methods.

“WHEAT DEMONSTRATIONS.”

Believing nitrogen where used in the fall on small grain crops, such as wheat, is of little or no value toward increasing grain yield, eighteen men are taking from one to two acres of wheat sown this fall as a dem-

onstration, using four hundred pounds of 16% acid phosphate per acre at seeding time, and a top dressing of nitrate of soda in the spring.

“ORCHARD DEMONSTRATIONS.”

Five orchards were pruned and sprayed under my supervision, and one of these under the joint supervision of State Horticulturist J. H. Carmody and myself.

“SUMMARY OF OFFICE AND FIELD ACTIVITIES TO DATE.”

Made talk on “County Agent Work” at annual picnic of “Smithfield Farmers’ Club,” Henry county, and a talk before the Sunday school convention at Brownsboro, Oldham county.

Total number of miles traveled by rail.....	1,224
Total number of miles traveled by team.....	2,370.5
Number of visits to demonstrators.....	277
Number of visits to co-operators.....	120
Number of personal interviews.....	235
Number of 'phone interviews.....	178
Number of letters written.....	320
Number of post cards written.....	47
Number of circular letters written.....	149
Number of newspaper articles written.....	6
Number of farmers and Club meetings.....	43
Total attendance at these meetings.....	934
Bulletins and circulars mailed to farmers.....	442
Bulletins given at visits, perhaps.....	200
Complete analysis of soils at Experiment Station.....	6
Analysis of limestone rock at Experiment Station.....	51
Number of acid soils tested by Truog System.....	23

Trusting this partial report is sufficient, and that it will meet with your approval, I beg to remain,

J. T. TAYLOR,
County Agent.

OHIO COUNTY.

Arriving in the county on Monday, May 3, 1915, too late to get acquainted with the people and their conditions, and then get in any spring and summer demonstrations, I proceeded at once to get acquainted and find out the conditions of the country, and get the county mapped out, which was a big undertaking, as this is the third largest county in the State. I went to the principal places in the county that were calling for me first, in

order to learn the people and their condition, so I could act intelligently with them, and lay plans for fall demonstrations in wheat, crimson clover, red clover and alfalfa and oats. At this time I arranged for some demonstrations in Soudan grass, for which it was not too late, and had splendid success with it. In my rounds over the county I found that they were needing much more stock than they had to consume the large surplus of corn and hay on hand, and also to make more manure than they were making to build up some of these impoverished hills over the county. So I began to urge them to increase their stock, and to build silos and utilize more of what they had, and save their manures and enrich their farms, and more cover crops for pasture for their stock; and at the same time to add to their soil what they had been taking off so long. So I began to talk silos to them, and in order to get them more interested, I decided to try to get them to make a trip over in Warren county, especially to see some silos over there, and I succeeded in getting about thirty-five farmers to go on this trip of about sixty miles, through a rough country to see what our neighbors were doing, and to investigate these silos. All came home delighted with what they had seen, and went to work to build silos.

We have four new silos built this fall, and will get 25 or 30 more next year, as a result of my work with them. I am getting them to take hold of cattle and hogs anew now, and they are getting in new stock and better stock. I found them using a complete fertilizer mostly 2-8-2, 2-6-2, and 1-10-2 goods, for which they were paying from \$25.00 to \$28.00 per ton, and I have succeeded in getting nearly the whole county to use a 16% acid phosphate that has cost them from \$13.00 to \$16.00 a ton, which has resulted in a great saving for the county, as well as giving them a much higher grade goods, and doing them more good. We are getting them to use more of it than they had been using.

We have had some hog cholera in a portion of the county, and I have vaccinated for nine different men and saved their well hogs. We have our people largely interested also in fall cover crops, and have quite a number over the county who have sown crimson and red clover,

and alfalfa on demonstration this fall, and most of it is up and looking nice. We have them very much interested in building up their lands, which I am urging as much as anything else. I have spoken at a number of places, and we have three clubs in the county besides a few A. S. of E. societies that we meet with; and we are urging education first for our farmers, and co-operation and road improvement, which they are taking hold of well.

I have visited an average of three or four farms a day while out, and traveled an average of about 80 miles a week; have telephone calls nearly every day, and am stopped on the road all the time by them to consult with them in regard to their work. They seem to be as much interested as any people I ever saw, and express themselves freely as being well satisfied with my work.

We have had Dr. Wright with us for four lectures on hog cholera in different parts of the county, and while the crowds were not as large as we would have liked, owing to the trials of the "Possum Hunters" going on here at the same time, and all were interested in it. We have also had Prof. Slade with us in poultry work for a short while, and hope to have him again, as I am trying to work up some interest in poultry and think I can. I am arranging for a Boys' Corn and Pig Club next year, and hope to have a very large corn club especially, as I think they are more interested in that than they are in the pig clubs. We had an exceedingly wet season, and they did not get to cultivate their corn as well as they would have had it been dryer, but they are much interested in cultivation, and I have interested them in selecting their seed corn in the field.

We have been called on to do pruning for the fire-blight in the apples, and are arranging for a good deal more of this work next winter, as well as spraying. I am kept out in the county so much that I don't have time for much office work, and reading and improving myself as I should like to do. I have to work late at night to keep reasonably up with it. I think my work is in good shape at present.

W. W. BROWDER,
County Agent.

PENDLETON COUNTY.

In answer to your request for a summary of my work to date, beg to advise that I have travelled a total of 2,705 miles, visited 92 demonstrators and 324 co-operators, paid 11 visits to schools, held 12 meetings, with a total attendance of 1,119; held conferences with 21 Agricultural Agents, 130 business men and 273 farmers; mailed 872 letters, 354 bulletins, and have written 26 newspaper articles; have treated 27 animals, and judged 31 head of live stock.

I was sent here April 14th, with no organization whatever behind me, the money for the work being put up by the schools. I organized a successful Pig Club of 35 members and a Corn Club of 20 members. Conducted a successful trip with fifty farmers to the Experiment Station, E. H. Taylor's farm, McKee Brothers' place, and the Elmendorf farm. With County Agent Fullerton, conducted an automobile party of 25 farmers from Grant county on a trip through Pendleton county. I have about forty school demonstration plats illustrating the value of limestone and acid phosphate on alfalfa; was instrumental in inducing the teachers at the last Teachers' Institute to vote to teach agriculture in all the schools of the county this year; was instrumental in bringing five tons of acid phosphate in the county, the first that had ever been here; induced the fair management this year to offer premiums to corn and pig club members, and had a fine display of both at the recent county fair; helped in making the agricultural exhibits the largest ever seen at this county fair, and we are at work now trying to make this an agricultural fair next year.

I have twelve one-half acre demonstration plats of winter oats, and four of barley; also, five of crimson clover. Have compiled a list of all registered stock in the county, and have aided in encouraging a much greater interest in it. Have recently organized a Pendleton County Crop Improvement Association, with E. E. Barton, President, and a membership of influential farmers. We elected a Vice President from each Magisterial District, who will be President of a sub-organization in his district, which will make the organization

very strong. We have organized one of the sub-organizations, and will organize the rest in the next two weeks. On November 4, 5 and 6 we are to have a Farmers' Chautauqua, and all the schools of the county will turn out to it, and I am spending a large portion of my time now visiting the schools to work up interest in the chautauqua, and to give talks on agricultural subjects. The schools are co-operating with me to the fullest extent of their ability, and would easily occupy all my time if I could devote it to them; and whenever possible, I take the students to a corn field, and give practical lessons on selection and care of seed corn.

I have recently gotten a Babcock tester, and have tested a number of herds. Have tested a number of samples of soil for acidity; have been instrumental in getting a "Jeffrey Lime Pulverizer" in the county, and prospects for securing one or two more; have compiled a list of all samples of soil from the county that have been analyzed, and have had two samples of Ca Co_3 tested. Will get some concrete silos erected in the spring and summer.

I believe this covers my work in a general way, and I shall be glad to hear any criticisms you have to offer, especially recommendations for improvement.

GRAHAM A. SMITH,
County Agent.

PULASKI COUNTY.

Following is a brief report of the work done in Pulaski county since January 1, 1915:

Last year conducted work with 64 demonstrators and co-operators.

This year I am conducting work with 93 demonstrators and co-operators.

The yield per acre from corn demonstrations was 53 bushels.

Sowed 53 acres of alfalfa on 22 farms.

Sowed 8 acres of crimson clover on 4 farms.

Sowed 9 acres of hairy vetch on 3 farms.

Pruned 2,688 fruit trees.

Sprayed 4,392 fruit trees.

Vaccinated 130 cattle for black leg.

Vaccinated 125 hogs for cholera.

Built 9 concrete silos.

Organized 16 farmers' clubs, 13 of which bought 317.95 tons of fertilizer, effecting a saving of \$1,144.62.

Saved farmers buying spray pumps co-operatively, \$30.38.

Saved farmers by co-operatively buying spray material, \$126.53.

Organized one Boys' Corn Club with 6 active members.

Organized, with State leader, 14 boys' and girls' poultry clubs.

Have held 24 boys' and girls' club meetings.

Have held 166 farmers' meetings.

Have made 986 visits.

Traveled 8,208 miles.

The most striking and successful results accomplished in the demonstration work were results obtained by pruning and spraying. There was not a spray pump in use on a farm in the county when the demonstration work started. First year I secured a pump and used it on 5 orchards; the results were so apparent that eight new pumps were bought this year; as many as four farmers bought a pump in partnership.

Before the demonstration work began only two farmers were growing alfalfa successfully. Now twenty-two farmers are growing it with success.

Pure-bred poultry is not raised extensively in this county. We are helping 118 boys and girls to grow pure-bred poultry.

We were told by public-spirited men, and by many influential farmers, that it was impossible to try to organize the farmers' clubs for co-operative selling and buying. In two years we have been able to organize sixteen farmers' clubs, thirteen of which pooled their fertilizer ordered this fall, and saved \$1,144.62. In addition to this saving from co-operative buying, the farmers derive much benefit from the regular club meetings, where they discuss their difficult farm problems. It is just a matter of a few more months' work with the clubs until we can have them marketing their crops co-operatively.

From the State Board of Agriculture I secured two sets of silo forms for the farmers, free of charge. From the Experiment Station I secured one set of forms for \$10 rent. My personal attention was given to the construction of the silos; this saved the farmers the expense of hiring an expert, and also saved them money by the proper proportioning of materials.

Before the demonstration work began there were only 5 silos in the county; last year I helped build three, and this year I helped build six. Next year we will build twenty-five concrete silos.

In connection with the boys' and girls' club work we have organized three corn and poultry shows. Instead of soliciting prizes from town people, as we did last year, this year we are working up prizes in the community where the club is. The farmers' clubs in some instances have taken this matter of prizes in charge, and gotten good results.

W. C. WILSON,
County Agent.

TRIGG COUNTY.

In response to your request for a brief statement of my work since I have been County Agent here, I take pleasure in presenting you with the same. However, it is a big subject and I can only outline it in so few words.

CORN.

We have over 400 acres of demonstrations in corn growing, besides an unlimited number of co-operators. The fact is, so far as I could find out, nearly every field in the county reflected to some extent the result of our work along this line. We fought turning plow cultivation with all our might and with splendid results. The yield at this time looks very promising.

CRIMSON CLOVER.

Realizing that the one supreme need of Trigg county soils is humus and that of a nitrogenous nature, at the close of the cultivation of the corn crop, I started on a campaign to get as many acres of crimson clover seeded

as possible. We had over a thousand acres listed, but a very bad storm reduced the acreage some. However, it is an easy matter to find fields of crimson clover in fine shape in all representative sections of the county. We refused to enroll any farmer who entertained any idea of cutting off for hay, as what we sought was soil improvement. Most of what was seeded is going to be in good shape for the winter.

RED CLOVER.

No red clover was ever seeded other than on wheat in the late winter or early spring, but we succeeded in getting a good lot of this crop sown in August and early September. The Cadiz Hardware Company is responsible for the statement that they sold more red clover seed at the season mentioned than they had at any other time. I have some specific data for this crop in my annual report, which is not arranged for a report like this.

ALFALFA.

We seeded about 85 acres of alfalfa among the people who had no idea that they could grow it, and at this time it looks good for a perfect stand. On our alfalfa we used about 350 tons of ground limestone rock and about 4,300 pounds of acid phosphate, sowing about 1,500 pounds of seed.

RAPE AND SOY BEANS.

These two crops were unknown when I took up the work, but we have a splendid acreage of each one; something like fifty acres of soy beans and about twenty-five of rape. The results along this line were highly gratifying and the acreage will be increased heavily in another year.

TOBACCO.

I have not sought to emphasize tobacco growing, as the bane of agriculture in the black patch is this very plant. What work along that line I have done has been in harmony with the experiments carried on at Greenville, by Prof. Roberts and the results show an increase

of from 2 to 6 hundred pounds per acre. My work with tobacco necessarily brought about such a wide discussion of the fertilizer business that it resulted in a large curtailment of the use of complete commercial goods. Anything branded tobacco grower sold for all it would bear and the farmers completed the robbery against themselves by using so little of this that no results could accrue. It was war to the knife and the knife to the hilt, and we won. A number of men used acid phosphate to start the tobacco off with the most remarkable results.

SOUDAN GRASS.

Our acreage of this plant is about five. It is being complimented by the farmers as a feed. We introduced this as a means of diversification.

CORN CLUBS.

We have some very good clubs. About 34 members and some very fine promises for results. In this connection I got the cashier of Trigg County Farmers Bank to agree to raise one hundred and twenty-five dollars for next year and to become my assistant in the work. We are going to to emphasize this more another year. Several of the teachers are organizing classes in corn growing at my suggestion and the boys are to become members of clubs in another year. The instruction will cover all phases of club work.

FARMERS' CLUBS.

We have a Crop Improvement Association that meets every second Monday and we always have big crowds. We have seven local farmers' clubs all in good shape with regular meetings in most cases. I am trying a new plan on my clubs which is working fine. Have them to operate in connection with the school and having a series of "Farm Days" all over the county. Several of these have already been held, but the most noticeable one was held in the southern part of the county, where two districts combined, took all the seats out of the building, one school taking one side of the house for their

farm and school exhibits and the other taking the remaining half. Seats were arranged under some magnificent shade trees. Dinner was served on the ground and enjoyed by at least five hundred people. Games and recitations, etc., took up the forenoon, while the afternoon was given over to speaking and judging. We have done much along this line—all that has ever been done, and the school authorities like it so well that the County Superintendent states in his annual report for this year that my work was remaking the schools. Other meetings of this sort are scheduled for the fall and winter. Here is my idea: Since the business of the people where the rural school is located is farming, the business of the school should not be shipbuilding. I have done more work along that line than I could crowd into a week, so I have lectured all over the county in the rural churches on rural education. What I have sought was an agriculture that educates, an agricultural education, instead of education in agriculture.

FERTILIZERS.

I have already mentioned this subject in connection with tobacco, but I want to say further that I never found but one man in the county who had any conception as to fertilizer facts. Very little high-priced goods were sold in the county in the spring and at this time only one ton of complete goods has been ordered for fall use that I can locate. It is acid phosphate all the way through now, because this soil responds in a remarkable way to phosphorous.

SILOS.

Three concrete silos and two wooden ones are the net results in that line, and with this has come in each instance a better grade of live stock.

RECAPITULATION.

This is a mere sketch. We have had a year of good things, with, of course, its heartaches. I have endeavored to make myself a part of the life of the people. How well I have succeeded is attested by the fact that I was

unanimously re-elected. I have sought to make the farm no longer a little place, where a little farmer, for a little space of time, in a little way, makes a little money, for a little home with little ideals; but a larger place, where a larger man, does larger things, with a larger vision, in a larger way, for a larger purpose, for a larger community in a larger State.

K. L. VARNEY,
County Agent.

WHITLEY COUNTY.

In answer to your letter of October 1st, asking for a statement of my work as county agent since my appointment, let me give the following brief summary of such activities as can be classified, after which I will give a few brief items about other things of importance:

	1914	1915
Miles traveled—		
Rail	474	1,311
Team (or horse)	1,539	1,558
Writings and bulletins mailed—		
Letters	453	343
Form letters	919	1,781
News articles	11	14
Literature mailed	3,730	1,336
Meetings held—		
Number	22	46
Attendance	422	1,321
Hogs vaccinated	7	30

The character and scope of the work may be well illustrated in the following brief summaries of various lines of work:

Two cars each of acid phosphate and ground rock phosphate have been shipped into the county on co-operative order by farmers. The saving on these (counting acid phosphate at \$20.00 a ton and raw rock at \$9.00, both delivered) has been \$305.40 and \$71.90, respectively. One car each of burned lime and ground limestone have been ordered co-operatively, but I do not have the figures at hand as to the saving on these orders. Other acid phosphate and perhaps other limestone orders in car lots have been made, but not at my direct instance.

Whitley County Better Seed Association has been organized in an effort to secure better seeds for the farm-

ers of the county. Little has been accomplished so far, more than negotiations with seedsmen. Arrangements have been made finally whereby much can be accomplished if the farmers will work together.

Two drainage plots have been mapped out and specifications submitted by the government engineer. Work has not yet been finished.

Nine farmers' clubs have been organized and fourteen others are in prospect. I expect to have at least 16. May have more; interest in these has far surpassed expectations.

One Unit Tuber potato improvement plot has been conducted this season using potatoes grown from fall planted Irish cobbles by a farmer in the county. Results varied between $1\frac{1}{4}\#$ to $8\frac{3}{4}\#$ from single tubers. Potatoes saved from hills produced over $5\#$. A few low-producing seed saved for comparative test next year.

A dozen or more orchards have had more or less pruning and spraying done in them. Results good, but blight has partly spoiled the effect of this work. Several spraying outfits will be bought this fall and winter. I grafted some trees myself this spring for the experience. Will hold a grafting school of one or two days this winter so that farmers may learn to graft their own stock.

There have been 15 demonstrations of the use of ground rock phosphate on corn (used with manure). Results have been uniformly the best. One man says his corn is improved 400% by its use. Wants two tons this fall to use again. In some cases the corn fired, due to being planted too thickly on land short in humus, but even in those cases the owners say that their corn is improving every day.

The canning club agent has not been able to reach all parts of the county, and in response to requests for bulletins on canning, I have sent out 125 bulletins on canning vegetables. Good results have been accomplished in many cases by these bulletins. The canning club agent has held two school fairs in connection with her club shows. The attendance has been 1,000 or more at these fairs. Four thousand cans were put up last year; 13,000 this year. The interest in this work is growing remarkably.

A rest room has been established by the civic league for farm women. This is expected some time to grow into the establishment of a farmers' club house.

The membership in the Boys' Corn Club and the Boys' Pig Club has been about 50 each this year. At the State Fair one of the Pig Club members won first prize for judging pigs. Two members fed pigs so as to gain over a pound a day. About 75 members are enrolled for the 1916 Corn Clubs. They are going in for soil improvement as well as for yield.

About a half dozen men selected seed corn in the field last year. Results are reported better in all cases. One ear to row test plot was planted this year. This season dozens of men are selecting their seed in the field. The results of the ear to row test plot planted this season cannot be determined yet, but indications are so strong for widely different results that I am planning to have several others started in other parts of the county next year.

A plot of Kentucky blue grass has been seeded successfully on the campus of Cumberland College; with acid phosphate and ground limestone the grass seems to be as much naturalized as in the blue grass region.

Appropriation of \$250,000 has been voted for good roads. I am trying to introduce the split log drag as a means of improving the roads which cannot be piked. Little progress has been made so far.

I am finding every day plots of crimson clover doing well where I did not know of any demonstration work. The acreage of crimson clover for 1915 will be ten times that of 1914, I think.

I am introducing vetch this season. Have about a dozen plots started. More wheat and rye are being sown in spite of the high prices of seed.

Sweet clover and alfalfa are being tried out at my suggestion. No uniformity seems to hold in the results. In some sections of the county both are doing well, in others only medium to poor. One plot of alfalfa is said by visitors from Kansas and Oklahoma to be equal to the best in those states. One plot of sweet clover, likewise, is most excellent. Other plots of alfalfa are merely existing, while most of the sweet clover is

making poor growth. I am expecting better results from the sweet clover the second year, since it is a biennial.

Some plots of red clover have been inoculated this season. Many more fields of cowpeas have been seeded this season than ever before. Other summer legumes, soy beans, peanuts, etc., have been planted only sparingly, but have been successfully grown.

A few good poultry houses have been built.

One pure bred Hereford bull has been brought into the county. Several pure bred boars have been introduced. One activity of the farmers' clubs which I am encouraging is the co-operative ownership of pure bred sires.

E. H. FAULKNER,
County Agent.

WOODFORD COUNTY.

Since coming to the county, I have treated 4,500 hogs with anti-hog cholera serum, and turned half that many more to the veterinarians of the county. Fifteen men have been taught how to use the serum themselves. Sixteen meetings have been held to educate farmers in the use of sanitation and serum to control this disease.

Eighteen demonstrations have been made with growing alfalfa; twelve with crimson clover; thirty-eight with other crops. Forty orchards have been inspected, and demonstrations have been made in fifteen of them. Five men were induced to show apples at the State Fair, and each of them took premiums, while apples from the county won first premium in the county display.

Seventy boys were enrolled in the Boys' Corn Club, and forty-eight of the number finished. Eighty boys and girls were enrolled in the Boys' Pig Club, with twenty-three finishing. Both of these clubs were well represented, and won a large share of the premiums offered at the State Fair.

Twelve boys worked in live stock judging, and ten of them went to the State Fair and won prizes.

Thirty-three schools were visited in the interest of club work.

One hundred and fifteen public meetings were held with a total attendance of 12,000 people.

A Boys' Corn Show was held last year, and this developed into a Woodford County Corn, Tobacco and Live Stock Show. This show had five hundred and eight entries in competition, and a number of exhibits not in competition. There were over 2,500 people visiting this show, which was held in and around the court house.

Some work has been done with diseases of clover and alfalfa in the county.

Assistance was rendered in organization of farmers to eradicate foot-and-mouth disease. A Commercial Club was organized at Midway, and we are now working on an organization to promote the welfare of the county at large. This is practically complete.

We succeeded in getting two County Agents in the Home Demonstration work in the county; however, this has, in a measure, failed, and the last agent was transferred to another county. Yet, out of this work has grown the Woman's Home Welfare Association, which provides for a local teacher in each of seventeen districts, and these have two hundred and more girls enrolled who are being taught cooking and sewing.

Work has been done to organize farmers and hold them together in co-operation with the Farmers' Educational and Co-operative Union in the county, while no soliciting has been done for that organization.

This county sent seven delegates on the trip to western Kentucky to visit the farms and study the conditions in that part of the State.

Work has been begun in a small way to standardize our live stock breeding and now several farmers are breeding the same breeds of live stock with the idea of selling together in a community sale. We hope to enlarge on this very materially.

Several farms where so many hogs had been lost through hog cholera that the owners had given up hopes of ever succeeding with them again, have been taken as hog cholera demonstrations, where, by the use of sanitation, good feed, careful watching, and the use of serum when necessary, raising hogs has proven to be practical as well as profitable for the past year.

O. F. FLOYD,
County Agent.

HOME DEMONSTRATION WORK AND GIRLS' CANNING CLUBS.

INTRODUCTION.

Like the Farm Demonstration Work the Home Demonstration Work and Girls' Canning Club Work is not directly under this Department, but is maintained by the Federal Department of Agriculture and the State University of Kentucky. The work was begun by this Department, but when Federal funds were provided, and the Smith-Lever act passed, the State Department of Agriculture reduced the amount of money expended along these lines. During the past year, this Department has only helped the work over the rough places, and has expended less than one thousand dollars in the work.

However, we have asked the State Agent for reports of the work being done throughout the State, in order to advertise what Kentucky is doing in the way of developing the Girls' Club Work, and better home conditions. This work is beyond the experimental stage, and has reached the point where it needs the hearty support of State and county officials, as well as the active co-operation of all citizens interested in the material development of the Commonwealth.

The reports submitted herewith show for themselves the splendid results obtained in twenty-five counties in Kentucky now maintaining agents in Home Demonstration and Girls' Canning Club work.

J. W. NEWMAN, COMMISSIONER OF AGRICULTURE.

COUNTY AGENTS HOME DEMONSTRATION WORK.

STATE AGENT, Mrs. Helen B. Wolcott, Shelbyville, Ky.

DISTRICT AGENT, Mrs. Margaret D. Jonas, Louisville, Ky.

County	Name	Post Office
Bell.....	Purnell, Linda (Miss).....	Middlesboro
Bourbon.....	Mitchell, Nannie R. (Mrs.).....	Paris
Christian.....	Graves, Eloise N. (Mrs.).....	Hopkinsville
Clay & Owsley.....	Scoville, Elizabeth (Miss).....	Manchester
Daviess.....	Worthington, Minnie (Miss).....	Owensboro
Fayette.....	Ginn, Mary F. (Mrs.).....	Lexington
Hardin.....	Claggett, Ida (Miss).....	Elizabethtown
Harlan.....	Skidmore, Rella (Mrs.).....	Harlan
Henderson.....	Weaver, Susan G. (Mrs.).....	Henderson
Jackson.....	Spence, Laura (Miss).....	Iona
Jefferson.....	Cramer, Vie T. (Miss).....	Louisville
Knott.....	Southworth, Annie M. (Miss).....	Hindman
Laurel.....	Black, Sallie B. (Miss).....	London
Lawrence.....	Collins, Emma R. (Miss).....	Louisa
Logan.....	Shaw, Bettie W. (Mrs.).....	Russellville
McGoffin.....	Blakemore, Mary (Miss).....	Salyersville
McCracken.....	Cope, Allie S. (Mrs.).....	Paducah
McCreary.....	Wright, Flora (Miss).....	Whitley City
Madison.....	Oglesby, Ann Rebecca (Miss).....	Richmond
Mercer.....	Goddard, Anna B. (Mrs.).....	Harrodsburg
Monroe.....	White, Julia (Mrs.).....	Tompkinsville
Muhlenberg.....	Bogges, Iris (Miss).....	Greenville
Owsley.....	(See Clay & Owsley)	
Rockcastle.....	Carson, Ella (Miss).....	Mt. Vernon
Whitley.....	Siler, Rhoda (Miss).....	Williamsburg

STATE AGENT'S REPORT.

The Girls' Canning Clubs of Kentucky have just completed their second year's work, and I have the honor of submitting the following general report, together with the report from each of the County Agents, given in the form of a short story.

During the season of March 1 to October 30, 1915, the organization of girls' canning club and home demonstration work in Kentucky embraced twenty-five counties under the supervision of twenty-four Agents, with an enrollment of nine hundred and twenty-two girls and six hundred women.

Two of these County Agents were appointed for twelve months' service, two for eight months, two for six months and nineteen for four months. In ten of the

counties having four months' work, the additional month of June was given for the purpose of devoting that month's time to home visiting, and initiation of the Home Demonstration Work. Five young women students of the Home Economics Department of the State University were also sent for the month of June as assistants, to teach sewing and cooking. This intensive campaign in Home Demonstration Work established a confidence between Agent and housewife that has since invited demonstrations throughout the season. Demonstrations in sewing proved to be the line of least resistance in efforts of the Agent to enter the home and established a permanent welcome. The organization this year was about double that of last year, both in number of counties and enrollment. This is not altogether a natural growth or expansion of the old work, but almost a new organization. Agents were removed from six of the thirteen counties, some being placed in larger and more difficult fields. We find results have justified this action, and that an advantage was gained from both changes.

Not only were changes made in supervision of the work, but this year's enrollment showed few members of last year's clubs. The first year's enrollment was one largely attracted by commercial possibilities of the work, and more confidence was placed in the magical results of canner and capping-steel than in the instruction of Agents; of course, results were disappointing.

Our twenty-five counties are distributed throughout the State. Each section is represented, and shows a different kind of interest, according to the section of the State and the occupation of the people. We have thirteen mountain counties, seven of which have railroad connection, and six are without. Seven counties are in Western Kentucky, and five are located in the central or blue grass section.

We have the coal miner, with the unbalanced possessions of a large family and a small garden patch, and the commissary conveniences for getting canned goods easily. The soil is poor, the land steep and rough without fences, and it is impossible to get as much as one-tenth acre of land for any club girl.

The mountaineer is interested in extending the abundance of summer food into winter rations by an easier and larger method than that of evaporation. Wagon freight of sixty cents per hundredweight for ten miles, on sugar and glass jars, as well as on canned goods from Indiana, makes the women of the mountain counties welcome instructions that enable them to can beans and corn with the same success as they have had with tomatoes and berries.

The farmer of central and western Kentucky knows the advantages in conserving the waste of garden and orchard, of time and labor, and of having more and better food for the family use, plus some to sell. While we have sectional differences of appreciation of the work, and different problems to meet, we find the same general need everywhere, and one remedy is indicated in all counties, the application of both ideals and science to conditions of home making.

The Home Demonstration Work was undertaken in Kentucky in an experimental way, leaving each agent to initiate plans and methods best suited to the particular home interests of her county. Incidental to supervision of Canning Club Work, a great deal of help was afforded the mothers and girls in the home. The "drop in visit" has proved to be the best means of giving demonstrations. Many of the agents have helped to cook dinner, wash dishes, dress poultry, churn and work butter. The services have been so varied and so helpful, that the greatest pleasure in the lives of many country women is the visit of the County Agent. Our short term Agents have been most successful in establishing Home Demonstration Work, and have done it in a spirit of true service.

As an indication of this service, I note the mileage report of our Agents. Thirty-four traveled 33,352 miles, an average of over 980 miles. Seventeen Agents averaged 100 miles each in walking. The Agent of McCreary county walked 450 miles, and traveled double that distance by train. The Agents of Logan, Bourbon, Madison, Fayette, Daviess, Henderson and Mercer counties averaged 1,690 miles by horse,

We find two special advantages from our experimental Home Demonstration Work, one is that we can hold the interest of the girls in the miners' homes, since we cannot get vegetables enough to do much canning. The girls became first interested in sewing, then in cooking and bread-making. They also learned to do better gardening, some of them selling a few vegetables at a high price. Another special advantage in Home Demonstration Work is that it gives the necessary home sanitation preparation for making preserves and jellies.

So far as the tomato crop is concerned, we have a very poor report to make. The crop was a failure throughout the State, owing to continued rains, especially during the polinization season. The plats in bottom land were lost entirely, a few surviving plants had little fruit, and that of an inferior quality. The crop was less than twenty-five per cent. of an average crop.

This small crop of tomatoes was large enough to serve the purpose of organization, instruction and inspiration, and the girls put their energy and enthusiasm into canning other vegetables and fruits. The summary shows an enrollment of nine hundred and twenty-two girls, number reporting four hundred and twenty-six, and the number of caps and aprons made four hundred and fifty-two. This indicated that more girls wanted to sew than wanted to can. The number of No. 3 cans of toamtoes is twenty-eight thousand eight hundred and ninety-eight, and the number of vegetables and fruits in quart jars is thirty-six thousand five hundred and fifty-eight. The number of other products, preserves, jellies, pickles and ketchup, is twenty-two thousand three hundred and sixty-seven, a total of one hundred and seven thousand eight hundred and twenty-three containers. An estimated value of this product makes a total of eighteen thousand five hundred and two (\$18,502) dollars. The estimated expense of cans, jars (more than half the jars were already owned), sugar, spices, etc., is three thousand and ninety-three (\$3,093) dollars, making a net value of fifteen thousand four hundred and nine (\$15,409) dollars, or a net average profit per girl of thirty-six dollars and seventeen (\$36.17) cents.

(MRS.) HELEN B. WOLCOTT,
State Agent Home Demonstration Work.

REPORT OF DISTRICT AGENT.

The District Work was begun by organizing McCreary county early in April, when visits were made to Whitley City, Pine Knott and Stearns. Besides meetings and talks in churches and schools, many home visits were made, in order to meet girls and women on a more intimate footing, and to get a better idea of conditions and needs. In all three places, the meetings were well attended, a sufficient enrollment obtained, and a very cordial reception accorded Miss Wright, County Agent, and me, both in the homes we visited and at the public meetings held. We were fortunate, too, in securing valuable co-operation from Miss Alcorn, County Superintendent of Schools, and from Mr. Butler, of the Stearns Company. The time between this visit and our meeting at Lexington was spent in the State Agent's office, receiving instruction and help necessary to a better grasp and understanding of the work, and in trying to keep the Jefferson county clubs together until an Agent could be chosen and appointed. The Lexington meeting which began April 26, and continued through the entire week, was a source of much profit and pleasure. Many things were made clear, the agents were brought in closer and more personal touch with Washington through the representatives sent for our instruction and became better acquainted one with the other.

State University, the Division of Extension and the College of Agriculture gave valuable contributions to our meeting, as well as a very cordial welcome to us all. The reception given us by Judge and Mrs. Barker was most enjoyable, and we all appreciated the opportunity that this kind and thoughtful hospitality afforded us for closer acquaintance and social chat.

The first week in May was spent in helping Miss Cramer to get started with the work in Jefferson county. Visits were made to each club, and appointments arranged for home visits, and other club meetings. Some specimens of our Canning Club work were exhibited at the headquarters of the Consumers' League May 10 to

12. Many visitors came to admire as well as to inquire; the men outnumbering the women. This brought our work conspicuously before a large number of people, and the co-operation of the Consumers' League added to its already excellent reputation. An invitation to talk to the cabbage patch women from Mrs. Alice Hegan Rice was accepted, and a short talk on "Gardens" and "What Can be Done in Back-Yard Gardens" was given May 10. After the talk many women came to ask questions, and several garden plats were visited. The interest aroused has borne some fruit, and had further encouragement and help from us through visits and demonstrations in canning by our Jefferson County Agents. A visit was made to Bourbon county later in the month, to help with organization. Several club meetings were held, and visits made, as well as some special instructions given Mrs. Mitchell, our Agent.

Consultations, office work and the selection of suitable containers for our club products completed the month, and ran into the early part of June. Then came visits to Rockcastle, Laurel, Harlan and Bell, instructing and helping agents and visiting their clubs, and in the homes of their girls as well, to learn more of environment and local difficulties. During July visits were made to Henderson, Whitley, McCracken, Muhlenberg, Hardin, Lyon and Logan. At Williamsburg a talk and a demonstration in canning were given at a farmers' meeting. The men not only listened attentively to what was said, but many attended the canning demonstrations, examined the canner and besieged us with questions. The visit to Eddyville to give demonstrations and instructions in tomato canning to the warden and to some of the convicts in the State Prison was exceedingly interesting. The men had put in several acres of fine plants, a cannery had been installed, sheds built for protection from sun and rain, tables and all necessary equipment provided. One division gathered and brought in the tomatoes, another selected and washed them; the scalding was in charge of yet another, while peeling, coring and packing were in charge of men more carefully selected, as were also the men who did the capping, etc. Two things impressed me forcibly during this visit, viz.:

the perfect cleanliness of every part of the prison, and the happy, cheerful spirit of the prisoners. After work was finished, and we were returning to the prison, I overheard one convict say to another as he looked admiringly at the prison building, "Bob, we've got the prettiest house in Eddyville."

The trips to Henderson, McCracken, etc., were for instruction to agents, and a better acquaintance with local difficulties. In early August a trip was made to Estill county to participate in one of a series of meetings to stimulate interest in better farming, the meetings being arranged by Berea College. A talk on Home Science and a demonstration in tomato canning were given. Visits were also made to Madison, Magoffin, Lawrence, Owsley, Jackson and Laurel counties. Demonstrations in canning and packing were given, many local visits made, and general instructions given. With the exception of Madison, the roads in these counties are, at best, far from good, but after the fearful rains of July, which continued into August, travel was very difficult, if not positively dangerous. Many miles were done on foot, rather than risk the fearful hills and gullies filled with mud. I found some of our agents carrying canners, cans, jars, and other necessary supplies on horses or mules, holding these in front of their saddles for miles over steep and slippery mountain paths, that the girls might be helped to do better and more efficient work. It was gratifying to note the interest of many of these mountain girls, who despite the loss of part, or sometimes the whole of their crops from excessive rain, seemed in no wise discouraged, but were always hoping and planning for better things next year. A visit to the Carter County Fair, September 2d, was made and demonstrations in canning beans given, but I had no message as interesting as were the side shows and races, and very few attended the demonstration. Preparations for our State Fair exhibit were begun September 7th, and continued during the rest of the week, as decorating, unpacking and arranging the different county exhibits consumed a great deal of time, as did the fitting up of the Home Demonstration feature of the exhibit. The week of the fair was spent in charge of our exhibit, which, by its excellence,

beauty and variety, the uniformity and appropriateness of container and pack, told, in part at least, the story of our season's work. Owing to the generosity of Mr. Newman, our Commissioner of Agriculture, who donated the lacquered cans, some of our girls, especially in the mountain counties, were enabled to put up huckleberries and blackberries for sale. The cans formed quite an attractive feature of our exhibit, and quite a number were sold. A trip to Fayette for consultation and visits to plats, and a demonstration in canning at Auburndale, in which Miss Cramer assisted me, finished the September work. A three days' stay in Mason county helping Miss Tuggle organize Home Demonstration Clubs, consultations with Mrs. Wolcott, and some institute work, which included Prestonsburg, Leitchfield, Hodgenville, and Elizabethtown, completes my work to date. Schools were also visited and talks made. Some interest was aroused, and a very cordial reception was ours.

In looking back over the year that is closing, and in trying to vision the future, the immense future of this, our work, one thing stands out forcibly and clearly, that whatever of hardship, of disappointment and discouragement may fall to our lot as agents, the privilege and opportunity for real service, whole-hearted and unselfish, are ours, and overtop and outweigh all else.

MRS. MARGARET D. JONAS,
District Agent Home Demonstration Work.

BELL COUNTY.

Having been sent to Bell county, as county agent, rather hurriedly, and with but ten days in which to organize the Girls' Canning Club, I directed my efforts, with the help of Dr. Foley, of Pineville, Secretary of County Board of Health, and Mr. Clayton, a supervisor sent out by the State to communities that could be reached easiest, and in which we were sure of finding plenty of girls. Dr. Foley and Mr. Clayton were going over the county holding night meetings and giving illustrated lectures, trying to encourage the making of gardens, and they very kindly told of my work in connection with theirs.

As there were no schools in session, I thought the best way in which to reach the greatest number of people would be to visit the homes, getting one girl to tell me of another eligible girl, etc. I visited seven places, sixty-eight homes, organized five clubs, enrolling fifty-four girls. I was very fortunate in finding the girls' fathers and mothers at home, as they would have to be consulted, of course. They seemed more anxious than the girls in several cases. In one of the places I visited, miracles just couldn't arouse any interest; another, Edgewood, a mining camp, the people had such small gardens that all the space was devoted to beans. As Bell county is very mountainous, and contains so many mining camps in which gardens are very small, only twenty-eight of the girls could have one-tenth acre plats, but Mrs. Wolcott told me to enroll them with whatever amount of land they could get.

The first club that I organized was at Gravity, three miles from Middlesboro. Here I enrolled fourteen girls—ten of them having one-tenth acre plats. When I returned to them in June, I found one girl had married and moved away, three had dropped out as they could not get the land, leaving ten club members, who were all faithful, and worked hard on their plats. Two of the girls made the best work in the county: Cashie Minton, 499 No. 3 cans of tomatoes; and Addie Soard, 137 No. 3 cans of tomatoes and 122 No. 2 cans.

Four other girls made fairly good records, but the crops of the other four were complete failures. I had an average attendance of eight at my sewing classes, which lasted through June and nearly all of July. I gave two demonstrations in light bread; one in the home of one of my girls, and the other in the home of a young married woman, who asked me if I would show her how to make bread, even if she was married. I also showed her how to make muffins. Mrs. Jonas was visiting me then, so I took her with me this day. In another home I got the dinner one day; made a chicken pie, fixed stuffed peppers and biscuits. My club members and their mothers were always asking me for patterns and recipes. I also did a great deal of shopping for them in Middlesboro.

At Shamrock, four miles from Middlesboro, in another direction, I enrolled nine girls. On returning in June, one had moved away, one couldn't get any land, and four dropped out. Two of the remaining girls were fine workers, and their mothers were doubly interested. The other girl was rather a shiftless sort; she would never come to the sewing classes, and ran every time she saw me coming. Her crop failed, as it was in such a low place, but I went to her home every time I could, as her father and mother were so interested, and I gave them the literature, and one or two bulletins. I enrolled one little girl in June who had heard about the work, and wanted to join. She only had about seventy plants, but she made a great deal off of them. I gave a light-bread demonstration and cooked dinner another day, including potatoes with milk dressing, plain omelet and biscuit. In another home I showed the mother how to make a plain white cake with icing, and was also able to help her with her sewing a great deal. The girl in whose home I made the light bread couldn't afford to buy tin cans, and as she could get twenty cents per dozen for her tomatoes, all during the season, I advised her to sell them, and she made \$20 on her plat, besides canning one hundred quarts in glass for home use.

In the eastern part of Middlesboro, called the East End, about one and one-half miles from the center of town, I organized a club, enrolling ten members, four of them having one-tenth acre plats, but on my return three of the girls having one-tenth acre plats had moved away; another girl married in two weeks; one could not get any land, and one hired out about July first. The remaining five were very much interested in sewing, but I was never able to get into their homes. Their crops failed, too; the largest number canned for home use was sixteen quarts.

Dr. Foley suggested that I visit Straight Creek, a mining camp two miles from Pineville, as the coal operators there were so anxious to have the home life of the miners more pleasant. This is a large camp, and some of the girls had good sized plats, although not near the one-tenth acre. I enrolled fourteen here, but I was never able to get more than five to the sewing classes.

The majority of them did all of the house work, and they didn't have many things to can, either. The financial conditions here were also very strained this summer, owing to a strike and decrease in wages. Two of the girls asked me to teach them bread-making, and when the time came they couldn't get materials. I gave one demonstration, however, in bread-making and the canning of beans. The five girls interested in the sewing made their aprons and caps, corset covers with crocheted and tatted trimming, and one girl made a dress. This girl also made cookies once under my instruction. The girls raised enough tomatoes to eat all summer, and some had several cans for home use.

My other club was at Hulen, twenty-nine miles from Middlesboro. This was the only agricultural section in the county, but all of the crops except one were burned up completely. Much interest was displayed here by the mothers. They were delighted with my method of canning, especially with blackberries and beans. I was permitted to go into any of their kitchens and cook anything with what they had. I gave demonstrations in light bread, corn bread, and cookies; also rice, how to serve beats as a vegetable with salt, pepper and butter, stewed onions with cream sauce, as they all had plenty of milk and butter. I helped one woman to screen her house, made fly swatters from scraps of screening; was called upon to help with the sewing, showed them how to cut economically, and made them patterns for underclothing and their plain dresses. I enjoyed being in this community very much, for the people were so hospitable and eager to learn new methods. If the tomato crop had been successful, these girls would have made a big showing, as none of them were afraid to work. At this place one hundred and eighty-nine No. 3 cans of blackberries were canned for the market.

I gave demonstrations, with Mr. Clayton's assistance, in canning tomatoes, beans, corn and apples in three places where I had no clubs organized, viz: Fork Ridge, Cary and Finley; also at Excelsior. At Finley and Excelsior the mothers asked for the organization of a club next year, if there happens to be an agent in the county.

In closing, I will say I enjoyed the work very much, both with the girls and their mothers. I had no trouble in getting their co-operation, also that of their fathers. In homes where we did canning in tin the fathers and brothers did all of the heavy work, which was a wonderful help. When I was making my last visit to their homes they told me of their plans for next year, if the work is in the county.— With the experience they have gained this year, even though under very discouraging conditions, next year, if the season is good, Bell county will be one of the first counties in canning club work, I am sure. As I had so few cans for the market, and they were all canned near Middlesboro, I found market for them there, selling at \$1.20 per dozen. I have heard from several sources that the people were well pleased with the tomatoes, and thought I sold them too cheap; but would rather have them say that than that I overcharged.

MISS LINDA PURNELL,
County Agent Farm Demonstration Work

BOURBON COUNTY.

On April 20th, I was notified that I had been selected as county agent for the "Girls' Canning Club," and after making application for the office, was expected to attend the County Agents' Demonstration Week at the State University.

Not having had any previous knowledge of the far-reaching effects of the Home Demonstration Work, I was profoundly impressed with the immensity of the undertaking, and more than proud to belong to such a body of workers, under such a grand government.

Filled with ambition to do for my county what other agents were doing for theirs, I set to work at once to reach the girls who might be able, at that late date, to secure ground, and make a start this year.

I found only two schools in session, Millersburg and Clintonville. At Millersburg I distributed about ten packages of seed supplied by the Government. Only two girls, Jennie Hubbard, aged eleven years, a cripple, and Lydia Thompson, aged eleven years, could have plats,

and these were given them by the landlord upon whose farms the fathers raised tobacco. Both these men prepared the ground, set out the plants, worked them, and gathered the tomatoes, taking great pride in the fact that the girls were "Canning Club Girls." Lydia Thompson will have more than one hundred and fifty (150) "4 H" cans from her plat, and Jennie Hubbard about fifty (50).

At Clintonville I found a lady who wanted her niece to belong to the Canning Club, and "learn to do things." As an inducement to other girls, she gave apron goods, one-tenth acre plats, and invited the club to meet at her home every Wednesday. Dinner was provided, a conveyance sent for the girls and their tomatoes, and everything done to make the club a success.

This club was the only one that met regularly, and they canned peas and beans for several housekeepers, before the tomato season; also made preserves and jellies for the State Fair.

The school at Clay's Cross Roads had closed, but the teacher called the girls together and a club was formed. I distributed tomato seed, and after a few meetings I found I could do better work by visiting them in their homes. In this way I became acquainted with the mothers, and found that while they were deeply interested in the success of the girls' plats, in most every case they were already overworked. The "stone" tomato plants were late, and the girls who depended on them have only a few cans.

I have responded to every call, and helped can the tomatoes, not allowing any to go to waste.

One girl was taken sick after her plat was set out; her mother and father could not find time to help, so the crop was lost.

Another girl tried in every way to keep the chickens out of her plat, but was unsuccessful. Both these girls made the aprons, and were very much interested.

On every side I have met hearty co-operation, a kind welcome in every home, from the woman of wealth to the mother who "takes in washing," that her girls may have the proper clothing to attend school. I am treated with consideration, and pressed to stay for meals, when

I am always given the best, which is sometimes dreadfully poor.

I have made sixty (60) home visits. In some I have helped can beans and peas, telling of the fireless cooker, and promising to help make several.

I have been able to make several suggestions which I hope were helpful, while discussing various household duties, as bread-making, butter-making, ventilation, sanitation, pure water supply, poultry raising, and sewing.

The work is only started, but I realize that a county agent has a wonderful work before her. It is a great privilege to be able to go into the home of a tired, over-worked woman, carrying a little of the outside world in, and making her forget for a little while, as the girls are shown how they may become self-supporting, and, at the same time more helpful in the home.

The members of the clubs canned seventy-five (75) No. 2 cans of peas, one hundred and twenty-five (125) of beans for home use, and made preserves and jellies, a part of which was sent to the State Fair.

We have canned nearly eight hundred (800) No. 3 cans of tomatoes, most of which will be labeled "4H."

Some of the girls and their mothers are planning for next year's crop, believing that with an early start the plats will pay them well.

Respectfully submitted,

MRS. NANNIE R. MITCHELL,

County Agent Home Demonstration Work.

CHRISTIAN COUNTY.

To set the people canning in Christian county was not a difficult matter, because we are a very progressive and receptive community. Our county was the first in the State to employ a farm demonstrator (this being done before State aid was available), and the canning club movement, therefore, was the next step in our demonstration work.

The appropriation for this was readily secured, and on March first, 1913, the first club was organized; and the statistics concerning the growth and the popularity of this club speak for themselves. The membership of the 1915 club nearly doubled that of 1913, the number

of cans of tomatoes more than doubled that of the 1913 club, while the number of pounds of tomatoes trebled that raised by the club of 1913. The first year we had three portable canning outfits, while this year we had twenty.

Our display at the county fair created more favorable comment than did any department, and in the words of the president of the fair association, "The Canning Club exhibit has attracted more genuine interest and applause than any feature on the grounds." One particularly noticeable display was that of Beatrice King (aged thirteen years), who had seventy fruits and vegetables prepared in various ways; all of these products grown on her father's farm. Beatrice expresses her appreciation in the following original lines:

"When winter snows about us drift
And winter winds are cold,
Small hands the Queen jar will lift
From fruits we have not sold;
'And when the wide old kitchen hearth
Sends up its smoky curls,'
Who will not thank the Canning Club
For Helping Farmer Girls?"

The prizes donated to the club girls amounted to eighty dollars; the contribution agencies being the Pennyroyal Fair Association and the County Board of Education. The canned tomatoes were readily disposed of to a local grocer, Mr. Claud Clark, and other inquiries came from merchants desiring to handle our output.

The field work has been productive of much good, and besides forty-seven club meetings, I have made one hundred and fifteen personal visits to the members enrolled. I have been able to assist in matters of sanitation, household management and arrangement while on these visits, and to give suggestions regarding labor-saving devices, personal hygiene, home care of the sick, and many other basic principles of high thinking and better living.

The scope of the work has been much enlarged this year, and jelly and preserve making, pickling and ketchup making have sustained the girls' interest, and attracted the mothers as well. Lucky indeed are those families who will partake of the Canning Club girls' winter provender.

In making an apron and embroidering the club emblem upon it, many of the girls have made their initial effort in machine as well as hand work; and in one club the members ventured further, and made canning club dresses.

The mothers of the past generation learned to cook and to sew in the school of experience, but our girls are not experimenting, they are in training to make efficient, competent home-makers. Sixty future home-makers in Christian county, all laboring along scientific and practical lines to live up to the reputation Kentucky has so long sustained, "the best place outside of Heaven!"

ELOISE NELSON GRAVES,

County Agent Home Demonstration Work.

The Fiscal Court of Christian County recently appropriated \$500 for the Canning Club work, to which the Extension Department has added \$500, and Mrs. Graves will be employed for the full year beginning January 1, 1916.

CLAY AND OWSLEY COUNTIES.

On the 10th of March, 1915, I began my work as county agent for Clay and Owsley counties.

The first day's journey was a tiresome one, over a rough and muddy road for about thirty miles. I visited three homes on the road, and reached Buck Creek, Owsley county, the 12th of March, and spoke to a large crowd in the interest of the Girls' Canning Club. Very few people had ever heard of the work, but everyone became interested in it. I organized a club of twelve girls, and visited several homes in the community, and gave demonstrations in bread-making. I then went to Vincent and organized a club of five girls and a mothers' club of ten members. As I started on my way through the county, I was compelled to stop for a few days on account of a deep snow. While waiting for the snow tide to run down, I visited about twelve homes, doing some work in sewing and cooking; also repaired a sewing machine for a lady who appreciated it very much. I traveled over a part of the county, but was unable to keep some of my appointments on account of high water. I

organized four clubs in Owsley county, with twenty-four members, and visited about twenty homes. Here I met with much encouragement, and most of the people seemed to appreciate the work done for them. Then I took up my work in Clay county, but was again delayed by deep snow. I organized six clubs in Clay county, with fifty-nine girls, and I never saw people more interested in any work than the mothers in Clay county were when I told them of the Girls' Canning Club work.

In June I started out again to do more demonstration work. I visited each of the girls, and helped most of them make their caps and aprons. The girls were very proud of them, but many were too poor to buy the material, so I advanced them the money. I visited about eighty homes in all, and besides making the aprons, I demonstrated making four fireless cookers, and some breakmaking; also helped to can two hundred quarts of berries in tin. I was out about six weeks, and traveled over two hundred miles.

In August I started out again to give demonstrations in canning in tin for the tomatoes. I found the tomato crop very poor on account of the unfavorable weather conditions, and only a few girls had enough tomatoes to can in tin, but I taught them how to-can, and they all seemed anxious to try again next year. One girl raised one hundred bushels, but only a few were fit to can, and they were black in the middle. I cannot give the exact number canned, but the number in tin will not exceed one thousand for home use.

However, the work has not been a failure, even though the tomato crops in most places were failures. The girls are all anxious to try again, and the interest manifested by both old and young proves there is much to be done in the years to come.

Besides the berries and tomatoes, we canned several lots peaches, apples and beans.

(MISS) ELIZABETH SCOVILLE,
County Agent Home Demonstration Work.

DAVIESS COUNTY.

The Home Demonstration Work in Daviess county for this year was supervised by means of home visitation, rather than through club meetings, as was last year's plan.

The enrollment was 18 girls in the Canning Club, and 44 women in the Home Demonstration Club. Bulletins and circular letters were mailed regularly to all of these. 279 visits were made to club members, 86 to co-operators, and 4 to local gardeners. The year's work began with an effort to dispose of last season's products, 26 local grocers being called upon for that purpose.

On account of the drought in the early spring, it was necessary to sprinkle the tomato plants. Later, during the blooming period, all of the plants were damaged and several of them entirely destroyed by the heavy rains. On the whole, the season was very unfavorable to the tomato crop.

Previous to the canning season the work consisted mainly of pattern drafting and fitting, 14 of the girls making dresses, and 12 club uniforms. Most of the latter were handmade and embroidered. Several of the girls became interested in hand embroidery and crocheting. Eleven girls practiced breadmaking and nine did creditable work in baking cakes. Occasionally attention would be given to quilting, making button-holes or home millinery. Seven fireless cookers were made, most of these as demonstrations to groups of women.

The girls put up 1,050 cans of tomatoes and 441 cans of beans. Twenty other varieties of fruits and vegetables were canned besides quantities of preserves, pickle and other products, aggregating 4,556 jars or cans. This includes 742 cans of tomatoes and 81 of beans put up by the 13 members of the Home Demonstration Club who submitted reports. Most of all this is intended for home use.

The members of the clubs live in various parts of the county, and to accomplish the work it was necessary to travel 2,136 miles. In addition to this about 700 miles were traveled by rail in attending the county agents' meeting in Lexington, the State Fair at Louisville, and the Farmers' Chautauqua at Greenville. Exhibits were

made at the State and county fairs with demonstrations of canning by club members at the latter. Twelve prizes were awarded the girls by public-spirited citizens as premiums for good work done. Seven girls prepared illustrated booklets giving a history of the year's work.

Most respectfully submitted,

MINNIE E. WORTHINGTON,
County Agent Home Demonstration Work.

FAYETTE COUNTY.

Canning club work was begun in Fayette county on March 10th, 1915.

During the month five canning and four poultry clubs were organized, with a membership of thirty-seven and forty, respectively.

Seed was distributed, instructions for making seed boxes were given, and the first lesson on poultry given out.

A demonstration of making a fireless cooker was given at the Athens school house to nine women, the county superintendent and the teachers.

In April our garden clubs were formed with a membership of twenty-eight. Garden plats were put in condition for planting, and the gardens planned. Several landlords were visited in the effort to get some ground for girls who had none, except their house-yards. So many tenants have large yards that are absolutely useless, but which the landlords will not allow to be used for gardens.

Some of our caps were cut out and made. The State meeting of county agents occupied the last week in April.

In May much of our garden was put in. The garden plan was drawn to scale, and put on the board by the boys of the club. Lessons on the tomato and transplanting our plants went on during the month. I distributed bulletins from the department and some pamphlets sent me by the Burpee Seed Company.

I obtained ground at Athens from a neighboring farmer for several of my girls, but their seed did not germinate, and they gradually dropped out. Out of thirty-seven boxes planted, only thirteen germinated

more than from one hundred and fifty to three plants. Those thirteen were not all of the best, six only being good. Prof. Matthews, of the Agricultural College, very kindly consented to grow enough to supply the lack, which he did.

Several conferences with business men were had, some business with the Fiscal Court attended to, some lessons on bacteria given, and many small details attended to.

June was spent in cultivating our gardens and in getting our tomato plants into the plats.

The gardens were situated so far from the homes of the children that I wonder any of them continued until they were finished. Next year they are to have them in their own back yards.

I have found such an astonishing lack of good gardens in the country, few have anything but the commonest vegetables, and do not put up much for winter—there is lack of variety. I even found some who bought their tomatoes from the grocery store in summer.

Instead of better equipment, the greater number of kitchens I have been in need cleanliness (although they need equipment, too) and management more than all else.

We did some work in preserving strawberries, also. July was spent in canning, preserving and pickling our garden stuff. A canner was ordered by the Pythian Home, and several trips made out there to instruct them in canning tomatoes. They attempted to can corn in gallon cans, and lost thirty-five gallons. We will have a tomato club from the Home next year.

August was a busy time during the first few days, while we were getting our garden display ready for the Blue Grass Fair. The children met me at the garden at five a. m., and worked liked 'Trojans until the display was ready. We did not get a prize, because we were up against too great odds. The city children had 1,063 plats in their own back yards, water at all times, a supervisor who did nothing else, and teachers and parents urging and encouraging them all the time. Continued rain, poor seed, sickness of a serious nature among our girls, the development of rot and wilt in several plats,

cattle getting in during a storm and trampling two plats into the ground, two plots developing with yellow pear tomatoes, and a few minor things, are the obstacles we have had to combat in this season's work.

The first of September was devoted to getting ready for the State Fair, visiting club members, helping with reports, and visiting schools. We are at present using up our green tomatoes in pickles. There are some sweet potatoes yet to be canned.

The girls sold a great part of their tomatoes in the market, for they brought so good a price that it was more profitable than canning.

Cans cost this year \$3.00 per hundred. I have traveled about 1,560 miles, held eighty-five meetings, with an estimated attendance of 1,579, and visited eighty-four women and girls. The mothers into whose homes I have gone have been profuse in their thanks to me for the improvement in the girls in the club, and say they want to have some women's clubs as soon as the fall work is over.

Visits of the county agents have inspired a pride in the appearance of the home; we have noted porches mended, houses papered, and kitchens cleaned in expectancy of their visits.

MRS. MARY F. GINN,
County Agent Home Demonstration Work.

HARDIN COUNTY.

The girls' canning clubs were organized in this county during the month of May, and as it was too late to make a hotbed the girls got their plots of one-tenth of an acre each in order, and used the plants they could obtain from the homes. Forty girls put out their plots, twenty plots were lost, mostly by high water or the rains, while the other twenty girls, most of whom lived in the country, tilled their plots, sprayed their plants, and worked on through the discouraging weather until the tomatoes began to ripen. By that time the girls had successfully canned in glass every fruit and vegetable that had come in season; had made their caps and aprons, and did the embroidery work at a cost of 35c per cap and apron. They drafted and cut patterns for

themselves and their smaller sisters, and some learned to crochet and make tatting, while others learned to do the simplest sewing.

After the tomato season came on, the girls were very busy with their canning work. When it was necessary for them to do their canning work, the superintendent of schools gave the time to the girls who were in the club.

At this time the girls have canned seven hundred cans of blackberries for commercial use and over four thousand cans of tomatoes, and are still canning. The prospects for sales are good. One girls sold to one merchant twenty-four dozen at \$1.00 per dozen.

I have visited over one hundred and fifty homes (excepting club members' homes) and in most cases I have found a welcome. In these homes I have given demonstrations in canning, and they have learned that sanitation is a much better preservative than the ordinary acids they have used heretofore.

A number of asparagus beds were started in May and early June. We have made a few fireless cookers, a number of fly traps of barrels, banana crates or nail kegs, covered with screening. Many fences, and even some houses, have been whitewashed this summer that were not last year. This being my home county, and knowing so many people, has helped me to get into the homes, but I am sure I have made many friends that I would not have had, because I have helped them to make or learn something useful.

The people as a whole are much interested in the work, and were much surprised at the beautiful exhibit at our county fair.

A good foundation has been laid for the work next year, and the county can be organized with very little trouble, as the housewives are anxious to be organized into clubs, that they may derive greater and more direct benefit than learning from the girls.

MISS IDA CLAGGETT,
County Agent Home Demonstration Work.

HARLAN COUNTY.

After receiving my commission as County Agent for Home Demonstration Work for Harlan county I started work on March 16th, 1915.

Accompanied by Miss Barr, I visited the County Judge and members of the Fiscal Court in the interest of the work. We found some objection to the work by some members of the Fiscal Court due to so much loss in spoiled cans last year. We succeeded in explaining away this objection. We then went to Benham, where we had a most delightful time, visiting a few homes and the public school, which was in session. Nine members were secured at this mining town. From this place we went to Wallens Creek, where we visited five homes and secured two members.

After Miss Barr had gone away, I made a trip to Evarts, Kentucky, where Professor Dizney and Reverend Trosper rendered me splendid service in arousing a great interest among the people of that community. I spent several days visiting the girls in their homes, and secured a large membership for the club. While at Evarts made a trip to Dizney, which is four miles from Evarts, and secured four members there.

After returning to Harlan I made a few trips to points near this city, and secured four members, which finished my list of thirty-two girls.

On April 26th I went to Lexington, where I attended the county agents' meeting, and received much valuable aid in my work. Beginning in June, I began my visits to the girls in their homes, where I helped them in laying off plats, and giving instructions as to plants. I also stayed in many homes where I assisted the girls in performing their home duties, teaching them by example, cleanliness and neatness. I always made it a point to assist mother or daughter in whatever task they had to perform. In this way I came in much closer contact with them.

This work I continued for a few weeks. The girls had the thriftiest tomato plants I have ever seen. Just about the time the tomatoes were beginning to set the rainy season set in and continued so long that most of the tomatoes rotted before they ripened. Many of the

girls had barely enough for home consumption, with none at all to can. In July I made preparation for canning blackberries. I secured from my grocer a number of small baskets and wrapping paper to line same, so the berries would not spill out of the cracks. I made several trips with canner, cans and baskets to the homes of different club members, endeavoring to fill cans with first-class berries, but it was impossible to get them because of so much rain, which made the berries mushy, and we only filled twenty cans. I thought it was better to have no berries than to have them of an inferior quality.

After our loss in tomatoes and blackberries, we turned our attention to beans, peaches and other fruits and vegetables from the home garden and orchard, and considerable interest was aroused in this way.

On Saturday, August 28th, we had a demonstration and exhibit at Harlan, and the girls had a splendid exhibit, receiving several nice prizes offered by local citizens. We sent a portion of the exhibit to the State Fair at Louisville.

The girls manifested a great interest in the work, and, in view of the hard weather conditions, we have had a fairly successful year.

(MRS.) BELLA SKIDMORE,
County Agent Home Demonstration Work.

HENDERSON COUNTY.

My appointment dated from March 16th, and came suddenly and without warning. It found me unacquainted with the work, and not knowing just how to start about it. Therefore, each step I have taken has been like a blind man groping his way.

In addition to this, the condition in Henderson county are not propitious to the rapid advancement of the work. In the first place, she proudly boasts of her conservatism, and in the next place people are not yet educated up to it.

Last year the agent struggled hard to arouse interest in the work, but only about four or five girls actually kept up with it. Eighteen were enrolled at the beginning. The eleven faithful ones still evince a keen inter-

est, although some did the work inferiorly. Some who started out poorly suddenly aroused to action, and really did most creditable work.

Bad weather conditions have been mostly to blame for poor results. Some girls were forced to drop out because the plants were entirely destroyed by the heavy rains. They had planted in low ground as the instructions said. The rains also damaged the quality.

Few have confines for their chickens, nor can you induce them to pen them up. Many bushels of tomatoes have been lost by the chickens eating them.

But, with all of our difficulties, our season's work has not been lost. Our county fair exhibit aroused such enthusiasm that I am looking to the agent in charge having a large enrollment next year. Many girls have voluntarily given me their names for next year. Mothers have given me their daughters' names, fathers have come promising me unasked what they will do next year. It does make me feel that after all the lethargy that has bound these people hand and foot for many generations is loosening, and that a glorious dawn is about to break. I hope to be the first one up to see the first gleam above the horizon.

Upon one occasion two of the girls and myself gave a public demonstration of canning tomatoes and beans. About a thousand people had assembled to have a picnic on one of the large farms. People were there from miles around. Much interest was evinced, questions asked, notes taken of my talk, and discussions aroused.

The interest and co-operation of several prominent club women has been given. Donations of money, visits made, vehicles loaned, orders given, etc., have each helped the cause.

My one idea in the beginning was to make myself acquainted with these people with whom I was to work. With this in view, I started out visiting them, and carefully studying the way to their hearts. I found them sensitive to a degree to any comparison to their way of doing things and mine. They would not hear to my helping with the cooking. I had to content myself with giving recipes.

But I found many an occasion to speak of the danger of flies. Where there are no screens they are trying to save to have them, and broken screens are mended.

If some law could be passed for the country as in the city, forcing better sanitation, it would mean much to country life.

Few of the girls I had enrolled knew anything about sewing, so I thought it wise to have them make their caps and aprons. We had meetings at different houses, and under my supervision they did excellent work. I also took advantage of this opportunity in trying to improve their English.

The crops were all late, owing to incessant rains. This was only the beginning of their difficulties. It seemed to me fresh ones beset us on every side. It exhausted my store of ingenuity to help them meet their obstacles and not let them give up. This lesson I tried to instill into them, to do the best with what they had. This is the besetting sin of too many persons—to let go all hold as soon as difficulties arise. It was their ambition, only half alive, I constantly played upon. I feel that I accomplished some good results. I noticed a marked improvement in cleanliness as the season advanced, a desire to do things as I wished it.

Money is scarce with these people. The improvements in their homes must come gradually. I feel that if I can teach them order, frugality and thrift, the desire for better equipment will follow.

Summing up my season's work, it stands thus:

Visits made, 153.

Miles traveled (by team) 1,269½; (by rail) 342.

Letters written, 396.

The exact number of cans of tomatoes has not yet been obtained, but it nearly reaches the 2,000 mark. In addition to this, we have put up for home use beans, corn, beets, pie-plant, and a variety of preserves, jellies and pickles.

MRS. SUSAN G. WEAVER,
County Agent Home Demonstration Work.

JEFFERSON COUNTY.

Owing to the fact that the agent first appointed was made assistant State agent, I did not receive my appointment from the Agricultural Department at Washington until May 15th.

Before this time, however, I had rendered eleven days of service in the field, planting tomatoes, visiting homes and canning by demonstration.

The enrollment of pupils was made from the county schools by my predecessor, but on visiting the homes, I found the causes of this small enrollment. Some of the girls could not obtain the 1/10 acre for planting, others could not obtain plants, three had removed from the neighborhood, some were away visiting, and three had surgical operations. I began work with twenty girls, out of which one stopped from lack of interest, three removed from Jefferson county, and seven had no tomatoes from the 1/10 acre plats, this being due to the cool rainy season, and the lateness of their plants being put into the ground.

Notwithstanding the failure of the tomato crops, the girls were faithful in their attendance at club meetings, and canned for home use asparagus, peas, beans, beets, corn, cherries, strawberries and plums, and blackberries for commercial use.

At the first meeting of each of the five clubs the girls made the standard cap and apron; at each succeeding weekly meeting they reported the work done in their tomato gardens, and the number of jars they had filled at home according to the instructions given at the demonstration lesson.

One of the interesting features of these club meetings was the large attendance of visiting girls, who, because of lack of tomato gardens, were not registered club members, but who took the instructions and practiced canning and preserving at home.

By special permission of the State Agent, a class of fourteen women was formed at the Cabbage Patch Settlement. This class met every alternate week, while the settlement was open for demonstration work in canning and the proper methods of cleaning and cooking vegetables for table use.

There was the greatest interest in this class and I was glad to find at the end of the season that in most of the homes the methods demonstrated in club meetings had been followed.

I was asked by another settlement house to show them how to can beans, and so with the help of some neighborhood girls canned fifty-three quarts in one day.

I was able to do a great deal of home visiting during the season, on account of the small enrollment, making a total of two hundred and seven girls visited. In most of the homes the girls were fairly well to do, but in the home of one girl the conditions were very bad. This girl, who is but thirteen, borrowed a horse and plow from a neighbor, and plowed the ground herself for her tomatoes, as her father would do nothing to help her. She had raised her tomatoes from seed, and had just gotten them into the ground, and in good growing condition, when a series of heavy rains started. Her plants were on a steep hillside, and were washed entirely away. As she had some extra plants left after filling her 1/10 acre plat, she replanted them, and a few out of the entire lot produced some inferior tomatoes, but most of them became scalded and dried up.

This little girl, who was next oldest of the family, would go into the hills behind her home, chop wood and carry or drag it back to the house. She also did most of the washing and ironing, besides attending to the smaller children, one of whom was a cripple.

They had but few vegetables on their place this year. There were some pear and plum trees, and Josephine canned these for home use, besides gathering blackberries from the hills near their home, and peddling them in the city of Louisville. By doing this, with her mother's help, she was able to pay the rent on their little farm.

Beatrice Agee, another club member, in the beginning of the season had prospects for a very fine crop of tomatoes, besides selling several hundred plants to less fortunate girls. Her plants were the finest in the country at the beginning of July, but within three weeks most of them had dried up. Notwithstanding the loss of the

tomatoes, she worked very hard canning for home use, and at the Kentucky State Fair she won three first prizes for canned vegetables and fancy product for commercial use. With this money she was able to enter the Girls' High School in Louisville.

Whenever I needed help from the community people, they responded readily. At the Jeffersontown Club a complete kitchen was furnished at the school for the girls to work in, and at the Orell Club many articles needed were given by Louisville people.

At the last of the season the Commercial Club offered twenty dollars to be given to the four girls doing the best all-round work. These girls are Patricia Bunell, Maud Mourer, Beatrice Agee and Josephine Johnson.

Throughout the season I worked one hundred and thirteen days, held sixty-eight meetings, visited two hundred and seven club girls, traveled by rail two thousand six hundred and eighty-seven miles, and by walking and conveyance four hundred and nineteen miles, with a total attendance of two hundred and thirty-six club members, and eighty-five visitors.

Respectfully submitted,

VIE T. CRAMER,

County Agent Farm Demonstration Work.

KNOTT COUNTY.

This is the first year that canning club work has been carried on in Knott county, and when the work was started last March it was necessary to make house to house visits in canvassing the county, first because schools were not in session, and it was hard to call the girls together, and second, the work was so new that it needed to be explained carefully to parents, as well as girls. After canvassing the county, thirty-two girls were enrolled, and much interest was manifested.

The work began so late that most of the land had already been planned for, and the girls had difficulty in securing their one-tenth acre, and several girls had to give up the work for this reason. Others had difficulty with the Government seeds, and thought it too late in the season to try again. By July the club girls were reduced to seventeen.

These seventeen had their courage and patience sorely tested. After the plants had been transplanted and were doing well, heavy rains began, the creeks rose, and some of the club gardens were entirely under water. They might have survived this, but the rains continued, the plants scalded, the fruit began to rot, and some members lost practically the entire crop, and all gardens suffered severely from rot.

When the canning season opened, the difficulty of travel, because of the condition of our mountain roads, made the work difficult. I did not urge the girls to buy canners this year, but I had two outfits, and the girls had the use of these. I purchased one thousand cans, and furnished them to the girls as they needed them. Miss VanMeter assisted with the work through July and August. All our traveling had to be done on horseback. One carried the cans packed in bags and tied to the back of the saddle, while the saddle pockets on the other horse were packed with capping steel, tipping irons, bottles of flux, hand towels, tea towels, and all things necessary for the work. Sometimes we would can one-half day with one club girl, then pack our things, mount our horses, carrying the irons, too hot to be packed, in our hands to the next place to begin over again. It was easier for us to do this than for the girls to transport their tomatoes in sleds over the rough roads, or carry them by basketfuls on their arms.

One club was particularly difficult to reach, as we could not communicate by letter, the office being remote, and seldom visited, and it was ten miles from our headquarters by a difficult bridle path across the hills, and seventeen miles by road. This way led up a creek bed some distance across a mountain to Ball Creek, which we had to ford eight times in going to our destination. We were warned to be watchful in doing this, as the heavy rains shifted the sand, and there was danger from quicksand.

There is always likely to be more or less of adventure in mountain travel. Miss VanMeter went out a few miles one afternoon, and was caught in a terrific storm. The creek were roaring torrents. She was warned not to attempt one ford, or she and her horse would both be

drowned. She left her horse and forded the creek by walking some distance, weaving in and out by a rail fence, where a misstep would have sent her into the rushing water. The next ford was not so bad, and she waited until a man came up on horseback and "set her across." By going some distance out of her way, around the hills, she reached home in safety, but thoroughly drenched and exhausted.

In attempting to pass a wagon on a stretch of narrow, muddy road, my horse made a misstep, and we both plunged down a steep bank. When rescued from under my horse, I was unhurt except for bruises, and a broken rib, and was able to ride on the eleven miles to my headquarters, and go on with my work the next day.

The work in Knott county has not been club work, but individual work. I have not visited clubs, but homes. In these visits there has been but little in the way of demonstration, except the importance of proper and cleanly methods of canning tomatoes and beans, of making catsup and pickles, and clear and pretty jelly. In one instance the jelly the little club girl made was the first ever made in the home, and this was also true in some instances of the catsup and canning.

Miss VanMeter had charge of the work on aprons and caps. Some girls had difficulty in using the thimble and holding the needle. The sewing lessons were much needed, and an important part of the club work. Once or twice we were able to demonstrate simple, sanitary treatment for ugly sores and cuts. Some girls when we spent the night were glad to try government rules for blackberry jellies and jams "just to see if they were good," and gave us the delicious results to test on our return.

Outside of the club work there has been an interest to try government methods of canning, and several homes have experimented with tin cans with a view to purchasing canners next year. In the way of home convenience little has been done. Kitchen arrangements and conveniences have been suggested and planned, but have not yet been worked out. A little pen was constructed in one home that could be used on porch or yard

as a convenient and safe place to leave the baby when the mother and little club girl had to be busy.

The work this year has been hardly more than an introduction. Only about three hundred cans of tomatoes have been put up for market. Some of the girls have put up a number of bottles of catsup, canned in glass for home use, and supplied the home table from their gardens; and as some say they have just begun this year to learn how, and another year they will be ready to make a success. One encouraging feature has been the ready market we have found in this and adjoining counties for all our club products. Although so little has really been accomplished, yet I cannot feel that the work has been a failure. The people in the county are beginning to realize the possibilities of the work. The ice has been broken, and if the work is carried an another year, I am confident that results will be more evident.

MISS ANNA M. SOUTHWORTH,
County Agent Home Demonstration Work.

LAUREL COUNTY.

The second year's club work in Laurel county was organized March 10, 1915, with an enrollment of 18 members.

I was unable to organize clubs as my members were very much scattered, so I did quite a lot of home visiting, making one hundred and ninety-six visits in all. I have traveled seven hundred and seventeen miles by team, and two hundred and fifteen by rail, making a total of nine hundred and thirty-two miles.

I only have eight members who grew tomatoes for real canning. Many others did not have them for table use from their one-tenth acre plots and home gardens.

One girl filled seven hundred No. 3 cans, another two hundred, which were the highest filled by any members. We only have a total of eleven hundred and thirty-four No. 3 cans, and twelve hundred and twenty-one jars of beans, tomatoes, apples, grapes, plums and berries.

In each home visited I assisted in some way, gave recipes, demonstrated with bean, corn, tomato and apple

canning in glass. Gave six demonstrations of canning in tin, and two with El Flo Cannerns.

Gave four demonstrations with fireless cookers, one of which was at a Teachers' Institute, before an audience of one hundred and sixty-four persons. I helped with making clothing for a family of poor children. One mother told me while her husband was unable to work, the money received from fresh tomatoes from the girls' tomato garden, was their only means of support. Each mother seemed very appreciative of any help I gave them, and they were much pleased with the handwork I taught the girls.

I had no clubs for the women, but did much visiting when I had no club work, and my suggestions were always kindly taken, and I feel that I did more real good than I could have done at club meetings, where such individual work would have been impossible.

I had the co-operation of our business men, who were very generous last year with prizes; and I also had the co-operation of our Farm Demonstrator and County Superintendent. I visited a number of schools, assisting with handwork and exhibit jars for our school fair.

I consider the work a very pleasant and profitable one, though we have our troubles and discouragements, such as a breakdown on the rough roads, and a three or four mile walk in, which, after all, is not so bad.

MISS SALLIE B. BLACK,
County Agent Home Demonstration Work.

LAWRENCE COUNTY.

The Canning Club and Home Demonstration Work was begun in Lawrence county in March, 1915, with the organization of Girls' Canning Clubs. The clubs were organized in fourteen neighborhoods, and later grouped. There was an enrollment of ninety-nine members. A large proportion of these girls withdrew, because of the newness of the work, and because seeds were sent out late to some neighborhoods, and there was no land.

After setting out the plants the girls had very little trouble with them, except hoeing, as there was plenty of rainfall, and they did not need to water them often.

On June first, an assistant was sent to take charge of part of the large enrollment. Quite a number of girls had trouble with insects before and after setting out plants, and were very slow about spraying.

At the beginning of the season the prospects were good for a large yield of tomatoes, but the heavy and excessive rains damaged both vines and fruits, and caused an almost absolute loss for some members.

The Superintendent of Schools is in hearty co-operation with the work, having had the work in canning done in his home last year, and seeing the benefits that could be derived from the work in this county. The school children were allowed to come to canning demonstrations and each teacher helped in every way possible to interest the girls and help the work.

One-half of the salary of the agent was paid by the citizens of the county seat, Louisa, and they also appropriated money for the prizes for the clubs, and helped in every way to make the work a success. The county people showed much kindness in helping the agents from place to place, and when there was a demonstration being made, everyone present helped and watched with interest. Sometimes there were as many as thirty at a demonstration, and the men took as much interest in it as the girls and women.

Some girls were slow about working, and others were careless about their record books, but they seem to realize the benefit of the work now, and the necessity for keeping their record books from day to day. Other girls showed remarkable interest in canning, and seemed to be spotlights in the neighborhoods in which they live. It is plainly to be seen that the success of the work in this county depends upon the interest and help of the fathers and mothers. In every case where the girls made a success there is a thrifty and interested mother and father in the background.

Because of the bad roads in Lawrence county it has been difficult for the girls to secure cans, and in some places there is no one who comes to town oftener than once a month. Some of the girls have never been to town.

The misfortune of having the county seat in the center of one borderline, and it being the only town of any size for the girls to secure cans, and also the misfortune of having bad roads, and the railroads on one side of the county, has kept the work here from progressing as rapidly as it otherwise would have done.

Two of the clubs were eighteen and twenty miles from the nearest point of getting cans. About five thousand five hundred cans were used in this county. Quite a number of outsiders became interested after seeing a demonstration.

The wholesale house in the county seat ordered and kept the tomato cans and sold them to individuals cheaper than they could have offered them from the factory, and this company made very little profit. This firm also kept the Queen glass jars for the people, and helped in every way possible to get the cans delivered, which was a difficult matter, as there is not much hauling done to some points in the county.

There are some club girls whose tomatoes failed absolutely because of the rain, and the agent helped the girls and mothers save the other fruit on the farm. Some neighborhoods had only one member who had a good crop, and this member literally divided with her less fortunate club members and neighbors.

There were thirty girls who made aprons and caps under the agent's supervision, and in two instances it influenced girls who had never sewed before to begin sewing successfully.

There were approximately thirty canners sold in the county this year, and everyone was pleased. A good deal of originality was shown in the making of home-made canners. One member took a reservoir from an old stove, and made a furnace of bricks, and did very successful work. Her brother made a tray of re-inforced chicken wire, and then made some tray lifters. This same girl's father bought wire fencing and fenced in her plat. Another member had her brother secure her some rocks, as there were no bricks, and she dictated the placing of these and formed a furnace, and put a reservoir on top. Her brothers made a tray of an old screen, and then made a small furnace of rocks to heat

the corn cobs for the capping steel and tipping copper. This girl was delayed in her work because of sickness in the family, but she allowed her neighbors to use her tomatoes.

The people showed a great deal of pride and interest in getting up the exhibit for the State Fair. They gave their best for it, and regretted that there was a failure in some crops so they could not show the best fruits from the county.

The exhibit that was sent to the State Fair was exhibited in the county fair, and the people manifested much interest and enthusiasm in the work.

Labor-saving devices, such as screens, mops, mop buckets, tables on wheels, fireless cookers, built in shelves, fruit closets, sewing machines, cooking utensils and washing machines, have been installed in many homes through the influence of the agents.

Lessons in breadmaking were given in almost every home visited. Better methods of dishwashing, such as rinsing dishes and getting them out of dust and dirt, and a method of cooling milk by setting it in pans of cold water, were given in many homes. Many women were persuaded to buy patent churns.

There are twelve girls doing canning work for commercial use. Owing to the large families and small crop of tomatoes, a number of girls did work for home use only.

Before the agent's work was begun in the county people failed in canning vegetables, and most people pickled beans and corn, and these vegetables were allowed to ferment in brine. This method was very laborious, and an undesirable product was the result. There were about seventy homes visited by the agents, and the people were very hospitable and looked upon the agent as a helper, and were willing to learn new methods.

The Commissioner of Agriculture's kindness in giving the girls cans for blackberries was an incentive to the girls for the work which was to be carried on later, and showed them the profit of home canning.

Most of the girls are selling their tomatoes to country stores and neighbors, and are getting ten cents a can for them.

The agents have asked one person in each neighborhood to look after the interest of the club, and thereby keep up the interest for the girls' work next year, and aid in the organization next year. This year has been the introduction of much good work that can be accomplished in this county.

MISS EMMA L. COLLINS,
County Agent Home Demonstration Work.

LOGAN COUNTY.

My appointment was received, to become effective February first, and to terminate October thirty-first. When beginning the work I found fifteen hundred cans of last year's tomatoes unsold. I at once began assisting members in disposing of the cans on hand. Sales were made for them, from one can to a dozen, and in six weeks every can had been disposed of at an average of ten cents a can. While selling tomatoes I began organizing clubs.

At first, as a result of the dissatisfaction of the previous year, I met with little success. I visited the different sections of the county, and in some localities I was met with an indifferent reception, in others with a rebuff. Where this attitude existed I withdrew and directed my energies to those sections where possibilities for co-operation were more probable.

After driving many miles, writing many letters, and telephoning no little, the organization was completed. Five clubs were formed with a membership of thirty-two. As rapidly as members were secured and clubs formed they were furnished lesson sheets. Members were also personally visited and instructed in work. In April, when plants were ready for setting, I again visited the girls. Found many members had failed on plants; to these I furnished plants, enabling them to get out plats.

As soon as crops were out I began demonstrations in sewing, beginning first with caps and aprons. Not a few girls knew nothing of sewing, and others were not able to secure material to use; to these I furnished

material. In all, seventeen girls made caps and aprons. Members were also given demonstrations in drafting patterns and making garments, such as gowns, undershirts, bungalow aprons, etc.

Possibly the greatest chance to get in homes was secured while giving demonstrations in sewing. All resentment to entering the home was soon dissipated, and an opening made for general work to follow.

Only twenty-five members put out plats. Of these, four plats were drowned out, and two others were ruined by insects. Efforts to have girls use spray were futile, and not only were plants damaged, but the fruit also, and very seriously. Not only were the tomatoes produced of a very poor quality, limiting the amount of standard quality, but the yield was not up to the average. In addition to these discouraging features, there were members unable to buy equipment and cans, and in this way much fruit was lost.

At this point I will relate a few cases of human interest, which bring out not only possibilities of work, but actual results. One member, living too far from any point to market fresh fruit, was also unable to purchase cans. The previous winter she had to wear her brother's coat to school. She was very anxious to make enough from the tomatoes to buy a cloak. Her mother was a widow with a large family, and the profits from the tomatoes were the only chance to enable the girl to secure necessary clothing to attend school. She got the cans. This same member had saved gallon molasses buckets used by the family. In this way she saved one hundred and forty quarts of tomatoes for home use by sealing wax.

Another case is a mother with five daughters. The mother is very anxious to keep girls at home, and find remunerative employment for them and herself, rather than have her girls go out from home to work. Only three of these girls were eligible to the club. They put out their one-tenth acre and secured a canner large enough to can several hundred cans per day, and so took care of the entire crop raised.

I have this year given forty-six demonstrations, and made one hundred and nine home visits. Girls have

canned for sale approximately five thousand cans, and have canned many for home use—do not yet know just how many. The girls were given demonstrations in making jellies, cakes and preserves. There are unlimited possibilities in this work. It is and will prove of vast educational possibility as well as of material benefit.

MRS. BETTIE W. SHAW,
County Agent Farm Demonstration Work.

McCRACKEN COUNTY.

The appointment for this work was not received until April 15th, when the organization of the clubs was taken up at once, and meetings of the country people called, and visits made, and the work has been followed up constantly to date.

This work was new to myself, and its purpose not well understood by the people. However, a club of fifteen girls was organized, twelve being from the Heath neighborhood, twelve miles from Paducah, and all living from five to six—and some fifteen miles—apart, showing that the memberships of the clubs organized covered nearly the entire county. While there were only fifteen members to start with, the season ended with nineteen.

Owing to the membership of the clubs being so widely scattered, it was difficult to hold club meetings. However, meetings were held usually once a week, and at other times personal visits at the homes were made; in fact, this form of work constituted the greater part of my activity among the club girls.

At the beginning this work was not so cordially received. The agent was regarded somewhat in the light of an intruder, or as company, but after the first visit, this feeling entirely disappeared, and the most cordial co-operation has followed the work of the entire season, this co-operation extending to the entire family, the farmers themselves even stopping their work to help in every way possible. Most of the girls have purchased canners and the families have made quite considerable sacrifices so that they might get the necessary cans, jars, etc., for the work.

Breadmaking has been taught in the homes, and different ways of preparing vegetables, importance of browning their biscuits, muffins, etc. Installment of household conveniences has been urged, such as running water in the kitchen, which has in some cases been secured. In other homes, where they have been unable to can fruit successfully heretofore, as a result of this season's work, their pantries are full to overflowing, and everything has kept.

The co-operation of the Superintendent of County Schools has been secured, and the girls have been allowed time off from school in which to can and put up fruit. He considers it more important than any study they have. The co-operation of the press, the merchants, and the Board of Trade of Paducah has been very much appreciated. The McCracken Fair Association has given us a large tent at the fair for our exhibit, and we expect to demonstrate canning in its various features for three days. Demonstrations have been made to the Lone Oak Home Economic Club, at which fifty or sixty ladies have been present.

Eighty home visits have been made. It is believed that the best results of the season's work have been accomplished by the home visits. In almost every home visited neighbors and friends have been invited to see the demonstrations.

Three hundred cans of blackberries, besides blackberry jams and jellies, have been put up; three thousand and twenty cans of tomatoes, besides catsups, chili sauce, pickles, thirty dozen glasses of jellies, and about one thousand jars of various kinds of fruits and vegetables are ready for winter use.

MRS. ALLIE S. COPE,
County Agent Home Demonstration Work.

M'CREARY COUNTY.

On the 11th of April, 1915, the Canning Club work was begun in McCreary county. A Club of sixteen members was formed at Whitley City, one of twelve members at Pine Knot, and one of ten members at Stearns. Later a few more members were added to these clubs, and other clubs were organized at Kingsville, Green-

wood and Indian Head, while two girls enrolled at Strunk, and one at Wiborg. Thus the County Club had at the beginning seventy-one members, two of whom were subsequently found to be under the age limit, thus leaving sixty-nine.

Seeds distributed among the club members about April 21 were planted and cared for by the girls under the instructions of the County Agent. At the proper time the plants were set in plats, were cultivated, fertilized and sprayed according to scientific methods in most cases, and yet, because of the extremely wet season, a great part of the large crops of tomatoes rotted. The diseased plants were pulled up, and rotten tomatoes kept away from the sound ones, until at last those who had had enough perseverance found themselves with about two-fifths of a crop of tomatoes, fairly good ones, to sell or can.

During the season, the members kept dropping out of the Club for various reasons; some got married, some insisted they could get no ground, some decided there was too much work to be done, and, of course, that sort of person is not desirable; others tried and tried to stop the rotting of the tomatoes, but stopped trying a little too soon.

During the season the girls were given sewing and cooking lessons at every opportunity. Not only this, but suggestions were offered to the mothers, in the most unobtrusive way possible, concerning things in the home. For instance, it was found that the screening of houses, the airing of beds more than anything else, the changing of furniture into more convenient positions, the removal of "dumps" and even the scalding of dishes needed attention. Sometimes before the tomatoes were ready to can the Agent gave demonstration lessons in canning to the mothers and girls.

Blackberries were the first things canned under instructions. These were mostly canned in glass. Some cans were received from the Commissioner of Agriculture, and the girls began to use them in canning the berries, but the blackberry season was over suddenly, and so just a few berries were canned in tin. Peaches, pears,

apples and other fruits were canned, preserved and jellied.

Then came the time for canning the products of the tenth-acre plat. Those girls who had the character to stay with the Club through all the disappointing season, entered with their mothers into the canning with zest, and some of them were well rewarded for their perseverance. The tomatoes were canned in tin and in glass, preserved, pickled, and even jellied. This jelly, by the way, being delicious.

Besides tomatoes there were canned beans and corn. A splendid product made of sweet peppers, and called "pepper hash" was put up.

Six business men of the county gave a prize to the girl making the best record.

Miss Edna Wilson, of Strunk, won this prize, making a profit of over thirty dollars. Miss Christine Larmee, of Stearns, was second. She made a profit of eighteen dollars. During the season more and more people were becoming interested in the work, and lending their assistance almost whenever asked. When the fiscal court met, and was asked by the Agent to appropriate enough money so that the girls of the county might again have a chance to join the Canning Club and work under the instruction of the Department, it did so.

MISS FLORA WRIGHT,
County Agent Home Demonstration Work

MADISON COUNTY.

"The Tomato Club" (as most people call our Girls' Clubs), of Madison county, can be called a complete failure, but we do not feel when we call our Club by its original name, "the Girls' Canning Club," that anyone could say that it has been a failure.

During March and April, with the assistance of the Farm Demonstrator, I succeeded in getting an enrollment of about fifty members. Not having enrolled any girls for clubs, and then worked with them before, I thought that was all that was necessary, until I went to our April meeting and heard the other Agents telling of their experiences of the year before, and worked myself with the girls this year. In other words, I thought

that if a girl wanted to be a club member, and she said that she could have one-tenth acre of land, and mamma *did not care*, all I had to do was to get her name and address, and send it to our headquarters, Washington, D. C. I also felt that she was fully qualified for the work. In this way I lost some fifteen or twenty girls who need never have been enrolled. Some girls had not one-half of the one-tenth acre when the time came to measure the plat. Others had joined because they enjoyed attending the first few little meetings, and did not realize that there was any work connected with it.

Early in the spring, just after most of the girls had set out their plants, we had a hail storm which destroyed five or six entire plats. This left the girls with fewer and smaller plants. Later we had two floods, said to be the worst in twenty years. Many crops were beaten to the ground, and partly covered with soil, sand or clay. By this time our prospects looked very small, and so many of the plats too wet to replant with other vegetables.

Only four club members have canned any tomatoes for sale. One of these girls has canned only fifteen cans. Two girls have canned about two hundred and twenty-five each, and the fourth girl has canned about five hundred and fifty quarts in gallon cans. Lona Templeton, the girl who canned the gallon cans, is a very deserving girl. She kept house for her father, and was a mother to her younger sisters and brothers from the time she was thirteen years old until last year. She is now eighteen. Her graded school education she has gotten the best way that she could. Having a desire to teach, and finding her father not willing to help her get an education, and having a sister now old enough to take charge of the home, she went to keep house for an old lady. Every penny she could save she saved. In the spring she joined the Girls' Canning Club, and has made enough money on her club work to carry her through the Kentucky Normal School for one term. She is now at the Normal School, and waits upon the table for her board and room. She will be able to stay there through the entire year, otherwise she could have stayed only through the fall and winter terms. I am only sorry that

she could not be a member next year, for she is now eighteen.

If there is no district nurse in our county, we County Agents find many, many things in their line of work that we can do. I have succeeded in persuading one mother to stop feeding her eighteen-month-old baby, weighing eighteen pounds, beans, new potatoes and green fruits. There are many other mothers in my territory who are doing the same thing. But it takes a long while to change the people's ideas about how to care for and feed their baby when they have raised maybe six or eight, and they feel that you have had no experience at all. If we County Agents were given twelve months in the year to work with the people, and could organize mothers' clubs or clubs of women and study those questions together, it would be much quicker and easier work to get the people to realize a few of these facts. In one home where there are eight children, we have had the water analyzed, and found it unfit for drinking purposes. Before you can do many of these things, you have to get well acquainted with the people. That is one reason why each month or year that we spend in the same county we can accomplish more than we did the month or year before. We can easily realize that from each visit we make to the same home.

After our tomatoes were such a failure, so far as quantity and quality are concerned, we turned our attention to the canning of fruits and vegetables, as well as to other household tasks. Many of the girls have been taught how to dress and cook a chicken, and every girl has been taught how to make jelly. We have canned hundreds of cans of fruit and many cans of vegetables, and glasses of jellies. Our canning is almost finished for this year, yet we feel that our work is just beginning, for each day we see more things that we could accomplish, that would be profitable both to the people individually, and to our people as a whole.

We are now looking forward to a more profitable year, which will be made easier by our many hard experiences of the past year.

MISS REBECCA OGLESBY,
County Agent Home Demonstration Work.

MAGOFFIN COUNTY.

There were thirty-five girls enrolled in the Girls' Canning Club at the beginning of the season of 1915. Seventeen of these, after sowing seeds and caring for plants, got them transplanted into tenth-acre plats. The other eighteen failed to go even this far, the reason with most all of them being an inability to get the ground in which to set the plants. Of the seventeen who planted their one-tenth acre plats, seven remained in the work to the close; the others lost their plants during the heavy rains before they bore tomatoes. The seven who remained hoping to have some tomatoes, late green ones, if nothing more, and who were glad to learn the canning of other vegetables and fruits, were: Mary and Iva Hammond, Bonnie Blankenship, Lucy B. Gardner, Hettie and Elsie Prater, and Eugene Thompson. Of these only Bonnie Blankenship and the Prater girls got any ripe tomatoes from their plats. They canned these for home use, as did all the others who canned their products in this county.

Outside of these club members, other housekeepers of the community were anxious to learn our method of canning vegetables and fruits; this I was glad to show them. We canned and preserved beans, beets, okra, rhubarb, gooseberries, soup mixture, strawberries (their syrup), dewberries, huckleberries, a few blackberries, plums, apples, and made apple butter, cucumber pickles, chili sauce and chow-chow; and made into jelly, apples, crab apples, plums, wild plums, grapes, wild grapes, dewberries, blackberries, rhubarb and apples.

Of course, each girl or housekeeper did not get all of these things put up; only those of the list which were produced on her place, or which she could get from others. But all these things were put up for winter use, some in only small quantities, but enough each time to learn the method, which was generally admitted "good."

One of the most valuable things to be taught along with this work was, I thought, sterilization and thorough cleanliness. Also methods of disinfection and sanitation generally around the home. I had occasion to call attention to the care of the waste matter, and its prevention from reaching the water supply, particularly where

there was contagious sickness; the drainage of the place; the danger of flies and their prevention. I tried to show the value of clean barn yards, hen houses, pig enclosures, and, indeed, preached everywhere cleanliness, pure water and fresh air, for the health of both man and beast. I distributed literature for the prevention and cure of hog cholera; sent twigs affected with blight to the Experiment Station, and secured and distributed such information as could be obtained on the subject.

On going into homes and finding sickness, there was opportunity on several occasions to show the value of simple remedies, such as hot water, salt water, olive oil, peroxide, etc. Advice was given as to care of baby, ill from lack of proper nourishment, and showed breathing exercises for the stooped and low-chested children.

The lessons in sewing consisted chiefly in cutting out such simple garments as aprons, shirt waists and plain skirts, as a knowledge of plain sewing seemed more important throughout the community than embroidery or other fancy work, although I did succeed in teaching in some cases, the making of better buttonholes. This art seems unknown in some families here.

These in the main are the things we have striven to accomplish in this county this year, and though they be small, even mere suggestions toward better homes and better ways of doing things, yet it is my earnest hope that the few who have been benefited by this work may, in the future, help others and thus cause it at last to be the blessing that it should be to the entire community in the years to come.

(MISS) MARY BLAKEMORE,
County Agent Home Demonstration Work.

MASON COUNTY.

Mason county has only had Home Demonstration Work during the month of October. In that period of time, I have organized three Girls' Canning Clubs and two Home Clubs among the mothers, and have at the present time three prospective organizations.

Under my direction, an orchard of thirty-one fruit trees and a small raspberry garden have been planted;

also, a school orchard is being prepared and will be planted this month.

The egg and its food value, including marketing, etc., is being studied and demonstrated. When plans have materialized, one of the Home Clubs will supply our local hospital with eggs at a profit above the local market price. The Egg Circle Bulletin is being used as a basis for this plan. This plan, of course, is in its infancy, and can scarcely be termed a co-operative market, but by the time the spring season opens and produce is more plentiful, I hope to have so proven to the members the material gain by co-operation, that the parcel post system of marketing may be successfully used.

Test questions that have a tendency to keep alive the interest, and at the same time have their instructive value to the Canning Club girls, about the growth of tomatoes, are being submitted from time to time for written answers.

Recipes are also given and demonstrated to them from Household Science and Arts. Each girl has a blank recipe book, and when a recipe has been successfully tried, it is copied in the book for home use.

Some special visits have been made, and meetings among the mothers have been arranged, at which meetings household devices were discussed. The fireless cooker and its value as a labor-saving device was advocated. These women had read of the cooker, but none had seen it in operation. A demonstration is needed before its value can be made convincing.

(MISS) FRANCES TUGGLE,
County Agent Home Demonstration Work.

MERCER COUNTY.

The work of the Girls' Canning Clubs in Mercer county began under the present Agent in April, 1914, with a four-months' term of employment. The co-operating agents were the U. S. Government, the State of Kentucky, and the Mercer County School Board. After being in the work for the four months, I found that it was impossible to drop it. The canned goods were not

yet sold, the girls and their mothers were wanting information on various subjects—hence while not working every day, 8 hours a day, never a day passed that I did not, in the interest of the work, answer telephone calls, write letters, make visits or stay in the room where we had our canned tomatoes stored, sending out orders.

So, without a break, the work of 1914 ran into that of 1915. In March the fiscal court, seeing the good accomplished, voted a salary of \$250.00, and the school board pledged \$50.00, thus making the term of employment 8 months.

Today, November 15, the work of the County Agent is not over, nor can it ever be, unless the work is taken completely out of the county; and not then would the work of the County Agent cease unless she died or the people could forget the office she had held. Otherwise, I think she would still be consulted about canning and the preparation for table use of the canned goods, the making of labor-saving devices, etc., etc.

This year, 1915, has been a very busy one. We began with a club enrollment of 62, but of that number only 52 remained in the Club. The ten that failed did so for various reasons. Three were married, two had typhoid fever and five became indifferent. The fifty-two remaining attained different degrees of success. Some have no goods for sale, but all have enough to supply the family with wholesome food, giving them at all times a well-balanced ration.

The girls are much more anxious to standardize than they were last year, and the quality of their work is evidenced by the number of premiums they have won. At the State Fair Mercer won the county exhibit prize, also five individual prizes. At the school fair, Jewel Matherly, a member of the Canning Club, won the prize for the best can of tomatoes over all other contestants.

A member of the Mercer County Canning Club, Emma Bruce Gabhart, won an \$8.00 canner for having the greatest variety of products for home use. She had 52 products.

Our State Agent, Mrs. Wolcott, early in January, 1915, sent out a young woman to demonstrate in cooking, so as to interest the women in our work. The result

was the organization of eight Home Demonstration Clubs, with an enrollment of 109. Since then, I have visited them when I could, and during my busy season with the girls, they have attended our canning parties, and gained information by 'phone, letters and bulletins, which I mailed to them.

I have also visited a number of farmers' wives, not enrolled, to gain their interest in the work.

To get the best results, the girls' work and women's work must go hand in hand, and is going hand in hand in this county. The daughter is glad to help her mother, and the mother no longer feels that she would rather do the work herself, than to take the trouble to teach an unwilling daughter: In many homes there is developing a spirit of co-operation between parent and child, before unknown and how beautiful to see!

Together they are learning to make labor-saving devices, together learning better and easier methods of canning and preserving and better ways of cooking. They are also learning to balance rations, and, as a result, how to keep the family in better health and spirits. Father and brother find things moving on more systematically. In short, in many instances, what was formerly a *house* is now becoming a *home* in the true sense of the word.

Kentucky is justly proud of her Commissioner of Agriculture, Honorable John W. Newman, for bringing this great work into the State. The good he has done will live long after this brainy, big-hearted man has passed away.

MRS. ANNIE B. GODDARD,
County Agent Home Demonstration Work.

MONROE COUNTY.

I began work on March 15, 1915, without any knowledge of what I had to do, except a short talk with the agent who recommended me for appointment; however, I began at once, and succeeded in organizing five clubs with forty members, but as a matter of fact, not all of these remained in the work. Twenty-one of these girls

planted a tomato crop, but this was a very bad season for tomatoes, on account of so much rain, and quite a number of those who tried to raise a crop had to abandon it, and I had only twelve members who made a crop of tomatoes. These twelve, or most of them, did good work for the season, and raised a fine crop, though they only put up for market about one thousand cans. Most of their goods was for home use. I had some honorary members who put up for market seven or eight hundred cans, besides a very fine quantity for home use. We are twenty-five miles from railroad transportation, but we have a home market for all our goods.

This is the first attempt at anything of this kind in Monroe county, and, of course, I had a lot of ups and downs, and more downs than ups. Our people need training, and I think that some of them are waking up and want to do something.

I did not get my commission in time to attempt much in the poultry line, however, our people are interested in this line and only need to be instructed. I demonstrated in needle work, and in domestic science in the homes I visited, but did not keep a record of this work.

JULIA WHITE,
County Agent Home Demonstration Work.

MUHLENBERG COUNTY.

Words are weak messengers to carry to Uncle Sam the appreciation we feel for the Home Demonstration Work in Muhlenberg county. Mothers are beginning to realize that the training of the girls heretofore fit them for everything except for that which is to be their real business in life, namely, the making of homes.

Home making as a profession is a thing of so great importance that it calls for years of careful preparation and earnest study. So the little time spent in Muhlenberg county in this work tells its own story.

Out of an enrollment of seventy-five girls, fifty-three canned over five hundred cans for exhibit work, in addition to their home canning, making about two hundred and fifty glasses of jelly.

Quite a number failed to get out plats on account of seed not coming up. Some after setting out plats lost them on account of wet weather. There were twenty very successful plats. Not being able to purchase cans, there only were about three thousand cans of tomatoes put up by the girls for sale. Beans, corn and other vegetables and fruits were canned up in the thousands with a good pack.

I have traveled 1,263 miles, met with the six clubs twenty-four times, and made one hundred and five visits into the homes. I find the best way to reach a girl's heart and life is in the home. Here we discussed not only canning, but the profession of home making.

The sulky plow has taken the place of the man with the hoe, and getting the best results with the smallest amount of labor on his part. The problem is what is going to take the place of the woman with the broom. Change such as this can come about only through education.

In quite a number of the homes where I visited, the girls prepared the lunch and dinner and served it without help of mother.

More light, fresh air and pure water have been advocated in club meetings, and at home. We have three fireless cookers completed, and a number ready to be put together.

There has been a great deal of fancy work done by the girls, which added greatly to the attraction of the homes.

In one of the club meetings in discussing homes, I ask why was the song written "Where is My Wandering Boy Tonight?" One of the girls answered the poet was inspired to write so because of simplicity and happiness going out of the home. I have also been made happy in receiving many letters of gratitude from the girls, and from school teachers.

The girls have asked me to extend their thanks and appreciation to Mr. Newman for the cans for blackberries. We are also grateful to Mrs. Wolcott and Mrs. Jonas for their helpful visits to our county.

Miss Bartlett, who was sent us as assistant for a month, left her influence in every home and club she

visited. We only hope she may be sent back to us again.

We also extend our appreciation to the fiscal court for their co-operation and generous support in helping the home-makers as they have home-builders. So true:

“A house is built of bricks and stores,
Of sills and posts and piers,
But a home is built of loving deeds,
That stands a thousand years.
A home, though but an humble cot,
Within its walls may hold
A poem of priceless beauty,
Rich in love's eternal gold.
The men of earth build houses, halls,
And chambers, roofs and domes;
But the women of earth, God knows,
The women build the homes.”

MISS IRIS BOGGESS,
County Agent Home Demonstration Work.

ROCKCASTLE COUNTY.

In the beginning of this year, I took an enrollment of only twenty-one members, hoping to accomplish more with the small enrollment than I had with the large one. I tried to get girls who were in earnest, and eager to do good work, but owing to weather conditions and some home difficulties, only a few of these have remained as club members. These girls have made their caps and aprons, canned beans, tomatoes, apples, blackberries and beets for home use, besides making jelly, pickles and preserves.

I have visited the homes on an average of once a week, endeavoring to teach cleanliness and neatness about their work, as well as economy, and a different way of sterilizing from their old method. The girls have learned to make ketchup out of parts of the tomatoes that will not do to can.

The home-made fireless cooker has interested the people as much as anything, and even the men like the idea of the fireless cooker, when you tell them that means less cutting of wood.

During the month of June, Miss Burrier, a graduate of State University, was sent to Rockcastle county to demonstrate Home Economics throughout this section. While she was here we visited ten different schools in Rockcastle county, visiting the ones where we had club members once a week. She demonstrated cooking while I demonstrated canning.

This year I have found the women in the rural communities such a help and inspiration. They have been so interested in canning different fruits and vegetables, and in the different ways of cooking fresh vegetables. I have received calls from different parts of the county to come and show the people our new way of canning, and they are easily convinced that it is easier and better than the old way which required the use of salicylic acid. One woman said to me: "I am tired of canning just one thing; I want a variety." She was always bringing different things, too, to learn to can them. Another woman said: "People ought never to can any other way when things look that pretty."

At one place where I had a club organized, we had forty persons present at one meeting. Then just last week the teacher in that district gave me sixteen names of girls who want to become club members for next year.

This is the first year we have had a sale for canned blackberries in Rockcastle county. Mr. Newman, Commissioner of Agriculture, gave one hundred lacquered lining tin cans to the county. In spite of the scarcity of berries in many sections, these cans were filled and readily disposed of. One little club girl with her mother picked and sold one hundred and twenty gallons of fresh berries, shipping some out of the county in crates, besides picking and canning two hundred quarts.

Although things look pretty discouraging for the girls' work this year, so far as results to be found in tin cans are concerned, there is a greater enthusiasm for Home Demonstration Work in the rural communities of Rockcastle county than ever existed before.

MISS EILA CARSON,
County Agent Home Demonstration Work.

WHITLEY COUNTY.

In March I began the organization of the Girls' Canning Club in my county for this year. This is our second year. I enrolled 69 members, and of this number but three were members of last year's club. One of the three took up teaching in July, and left me but two experienced members. For one reason and another, the girls dropped out, mainly because of much rain and no sunshine, until I have but thirty-two members now.

Last year the tomatoes canned in tin amounted to about 4,000 cans, and this year we have nearly 13,000 cans. We have canned in glass a great many more hundred than last year for home consumption. Canning in this county, to my belief, has been a great blessing, in the poor homes especially, because a variety of eatables will be served that have never been there before.

When we failed on tomatoes, we put up beans, and we have canned in about this proportion: Tomatoes, 8,000 in tin; corn, 1,100; beans, 3,500; peaches, 600 in tin; blackberries in tin, 100. I think a fair estimate would be that we have saved the county \$2,000 on our tomato plats, and on what would have gone to waste.

I have been able to do most of my traveling by railroad, since most of my girls live near the stations, although I have some that live five miles from a station, and the entire membership of one club lives ten miles from the railroad, and that of another fourteen miles. I have used in this work a one-thousand-mile ticket book, in addition to other railroad fare. I have walked 174 miles, excepting the visits to local girls. I have traveled by team and horseback seventy miles.

I have demonstrated in the individual homes principally. I could not work in clubs. I have demonstrated how to make bread; how to wash and scald dishes; how to wash the udders before milking the cow; how to make biscuits and pies; how to fry meat and cook eggs without cooking too long, and how to cook oatmeal and to make butter. I have visited in every home an average of five times. I have talked on sanitary wells, and begged, in as tactful a way as I could, for screens and some kind of toilet or closet house. I have gotten homes to

put out lime, and it has given me joy to see my advice taken at times.

I believe the hardest task has been to get the girls to be at all businesslike, and answer my letters and keep records. I have succeeded in getting the mothers and fathers at last say to the girls: "You must keep accounts."

I have distributed bulletins of every kind and description, and carried on, as I did last year, a system of sending to girls every available literary material found in magazines that would help them in their homes, and in their work, or that would inspire them to look for more knowledge of any good kind. My special object in this has been home sanitation, ridding of flies, and girls' canning work in other states.

Some folks already say: "This Canning Club work is the grandest work on earth." Some, of course, are not open-minded, and are stumbling blocks. I think myself that it has been very helpful to those who would receive help in a moral and material way.

I have the output of canned goods practically sold and anticipate no trouble in disposing of them, and think I can depend on all that is put up as being put up honestly, and up to the standard.

I know I have worked very hard, and believe the breaking of the soil already accomplished, promises a big harvest. I think the next year will bring more co-operation, and more interest, as well as more skill in the work. In fact, the outlook is very encouraging. I think this year there has been a real material increase of nearly four times that of last year.

RHODA SILER,
County Agent Home Demonstration Work.

PART SEVEN

REPORT STATE HORTICULTURAL SOCIETY, 1915

KENTUCKY STATE HORTICULTURAL SOCIETY.

OFFICERS ELECTED FOR THE YEAR 1915.

President,

FRED MUTCHLER, Lexington.

DISTRICT VICE PRESIDENTS.

W. H. Clayton.....	Boone County	Hebron
L. E. Hillenmeyer.....	Fayette County	Lexington
John T. Milligan.....	Hardin County	Stitton
C. E. Sugg.....	Henderson County	Henderson
F. E. Merriman.....	Jefferson County	Louisville
Jay H. Northup.....	Lawrence County	Louisa
Fred R. Blackburn.....	Powell County	Stanton
C. D. Smith.....	Rockcastle County	Conway
H. Van Antwerp.....	Rowan County	Farmers
John H. Richardson.....	Trimble County	Bedford
Morgan Hughes.....	Warren County	Bowling Green
Mrs. J. M. Garrett.....	Woodford County	Fort Garrett
	Secretary-Treasurer	
C. W. Mathews.....	State University,	Lexington

PROCEEDINGS

KENTUCKY STATE HORTICULTURAL SOCIETY.

The Kentucky State Horticultural Society assembled in the lecture room of the Experiment Station, Lexington, Ky., at 9:30 a. m., January 7, 1915, with an excellent attendance, which was continued throughout both the morning and afternoon sessions. The morning session opened with an address by the President, Dr. Fred Mutchler, as follows:

PRESIDENT'S ADDRESS

Dr. Fred Mutchler, Lexington, Ky.

There is an increasing interest in horticultural work in Kentucky that is encouraging. There is an interest which is shown in the exhibit that we have in our cramped quarters here that is certainly encouraging to people interested in horticulture. The secretary tells me that if any sort of effort could have been made, we should have had a fairly large exhibit this year. It was not indisposition on the part of the people that this effort was not made, but simply the fact that our facilities for storing and putting up an exhibit of this sort are so limited and cramped that we could not handle a more extensive exhibit.

A few weeks ago I visited the Horticultural Society of the state of Illinois. We hear a great deal of that organization. There were present during the two or three days of that meeting about 100 people as an average attendance. The exhibit that they had there was about five times as large as this one is, and with sufficient room, I think we would have no difficulty in making a presentation of the work of the state of Kentucky in horticulture that would compare very favorably with that of the state of Illinois. It is encouraging to the farmer to see the interest that scientific people are taking in horticultural problems for the purpose of helping him. It is encouraging to the scientist who is interested in the development of this problem in the state of Kentucky to see the interest that is manifested on the part of the general farmer in this work.

Being in close connection with extension work in the state, it will be of interest to you to know that there are probably as many inquiries concerning the treatment and handling of a home orchard

or of small fruits as in almost any other line of endeavor that we are following. It is the most common thing for us now to receive an inquiry concerning the methods of making an old orchard productive. It is a very common thing to receive inquiries concerning methods for starting new orchards. Almost with the day comes an inquiry concerning some phase of horticultural work from some farmer. It seems to me we are simply at the dawn of the development of horticultural work from the standpoint of the farm, and the farm home in the state of Kentucky. There is hardly a time when an individual from the college or experiment station gets away from here that he is not deluged with questions relative to the commercial capacity of orcharding in the state of Kentucky. Outside of the state of Kentucky nurserymen are looking towards this as a veritable field for furnishing plants and small fruits and fruit trees and are making a great effort to "get in on the ground floor." I am constantly thinking of what the future will mean to the people who are following that line of horticultural work in the state of Kentucky, and largely the success of the work in this state will depend upon the kind of material that these people can supply.

In certain sections of the country there is much discussion concerning the best methods of handling orchards, and our extension horticulturist has almost been worn out in answering the calls for such work in the various districts of the state, and we have had two or three men out at one time working with the farmers, trying to handle their small fruit crops. In some sections of the state there is beginning to be an interest in the matter of grading and packing fruit, and I refer in that respect not only to commercial centers that are pretty well known where they have large co-operative societies, but in the districts where fruit has always been poor heretofore.

In Pulaski County this year, where large quantities have been grown, the people began to think about putting up that fruit in such a way that it would attract the attention of the folks in other markets, and that phase of our work in the state is beginning to develop in a way that is really encouraging.

I want to say that from a number of sections in the state—at least three I have in mind—there are being put on foot organizations of the farmers for co-operatively marketing the small fruits, all of which means a very great deal to the state, and especially to those sections where these are being encouraged and developed, because of the fact that in the mountainous regions of Kentucky, where fruit grows so well and where the people do not have the income that comes from the more common general crops that are grown in the state, such organizations are needed. The eyes of that section of the country are turned toward us for production of some of the

early fruits—early apples like Yellow Transparent—that get upon some of the northern markets a little earlier than others.

I rather think that this year has been a little discouraging so far as the development of commercial apple growing in the state is concerned, on account of very untoward conditions arising from a number of causes, almost all of which are blanketed under the name of the European war. A man told me that 50,000 bushels of good apples have frozen in West Virginia recently, but they were inferior fruit.

It ought to be the object of the Horticultural Society of this state to disseminate general knowledge and practice relative to the care of fruit and fruit trees. We ought to have our people commonly to understand these things and how to make their orchards of the most value to them. I want to call your attention to the fact that this is the problem that the College of Agriculture has set, and I hope we shall be able to do a more extensive work along that line. I wanted to make this preliminary statement relative to the problem in order to start us on our way in the work this spring. Down in western Kentucky is one of the greatest fruit growing sections of Kentucky. In certain sections of the highlands down there and in certain sections of the lowlands there are great fruit growing areas. It is not limited to any special section of the country so far as the state of Kentucky is concerned.

We have had some representative every year from Warren County to speak about the strawberry growing interests there. Next year there will be 225 carloads shipped out. Eight years ago there were only fifteen carloads shipped. The Warren County Association has the reputation of being the greatest co-operative society in the United States. I take pleasure in introducing to you Mr. Morgan Hughes, who is connected with the extension work of the college here, and is stationed at Bowling Green, in co-operation with the Western State Normal School. He will speak on "The Growing and Marketing of Strawberries."

THE GROWING AND MARKETING OF STRAWBERRIES.

Morgan Hughes, Bowling Green, Ky.

I do not profess to be an expert in anything. I am just a farmer who has been trying to learn how to grow strawberries. In this little discussion, I hope you will ask me any questions you like. I will try to tell you what we have done in Warren County in growing strawberries, and probably a little history. of this Strawberry Association might be interesting to show you how very small things gradually grow into importance.

Warren County, like most of Kentucky, has always been recognized as a place where you can grow strawberries. We started in

a small way with this association. Living near me was a young man who had been growing several acres of strawberries every year, but they had never been able to ship any of the berries out. They arrived in such poor condition it was not profitable. One man said to me: "If we could ship the berries in carload lots it would pay." I was not especially interested as I had a farm of about forty acres and did not grow strawberries. About that time we had a railroad agent that was an enterprising fellow, and he wanted to help the L. & N. Railroad all he could. He sent for me one day and said, "I want you to help me get up an association here for growing strawberries." I said I didn't want to grow strawberries. "I've got more now than I can do, though I will help you get it up." We got seven or eight growers together, and to make a long story short we got together and planted fifty-five acres of strawberries. In deciding the varieties we needed, every fellow planted the variety he liked best. That was one mistake we made. The first year we began to market we found we had lots of strawberries we could not ship. We then decided there were about three varieties that were profitable—an early, an intermediate, and a late. It looked pretty serious when we began to market them. Towards the latter part of the season, however, we got in with a better strawberry and got \$1.25 a crate. The next year we had a shorter crop and we had learned a great deal. We profited a good deal on our returns, but we got a better price and netted \$2.00 a crate for them. So the next season we began to plant more. They have to be planted a year before you get anything out of them. The next year we did pretty well, and then we began to plant some more, selecting those varieties that were better suited to our climate and soil and that the market demanded. In our case these were the Klondyke, Aroma and Gandy, and we have been growing these three varieties for several years. Recently, however, we have discarded everything but one variety which suits us better than any other, and that is the Aroma. A few growers still grow other varieties, but practically 99% of the growers use Aroma.

The year following we had a good crop and we got \$2.10 on an average. This price means f. o. b. cars. This is the price not counting the picking, packing or freight. The following year it kept getting better. We averaged \$2.15. Everybody was getting rich. The next year we struck a snag. Our strawberries got in about the time everybody's did. So we only got \$1.75. I will say this, though. Anything over \$2.00 a crate is "velvet," as they say. But after getting \$2.15, \$1.75 did not sound so good. The next year we struck it very bad. We had 1,200 cars, and for various reasons we had a bad season and bad market and we only netted \$1.35 for these strawberries. Well, the following year we had a very fair crop and netted \$2.10 for them, and the year following \$2.25, and last year

\$2.55. Now, in the eight years in which we have been growing we have had six good years and two bad years, which is a very good record indeed, and it looks like we have made a reputation which we feel justly proud of.

Now, as to the growing of strawberries. In the first place, any land that will make 40 bushels of corn will make Aroma strawberries, 60-bushel land will grow ideal berries. There is such a thing as having the land too rich to grow the best of Aroma berries. We have to have plenty of nitrogen in the soil. We put 200 to 1,000 lbs. of fertilizer to the acre, and get the best results from the acid phosphates. We do not need any potash. We are trying not to put on too much nitrogen, so we are using mostly phosphate. If the land is not good, we put on some barnyard manure. We plant these berries in the spring of the year. We try to get them in by the middle of March, but usually by the first of April. We make a good seed bed. We lay it off three feet each way, which takes about 5,000 plants to the acre. We buy the plants co-operatively and have been getting very good prices—\$2.00 a thousand, delivered at Bowling Green. We bought 4,000,000 plants from one firm in Chattanooga at \$2.00 a thousand. Many growers have grown their own plants.

(Question: Is there any difference between the southern and northern grown plants? Ans. No.)

Later on, we cultivate (using the Planet Jr. or small harrows), and take a row at a time. We cultivate the berries both ways, until the middle of July, when we discontinue cultivating both ways and cultivate only one way, allowing the strawberries to make a matted row. We first made wide matted rows, but we decided we got most of the berries off the edges and we found also the wide matted rows were difficult for the pickers to pick in. So we allowed the matted rows to be eight or ten inches wide. In the fall of the year we leave them about ten inches wide, but in the spring they spread out to 12 or 14 inches. We have to cultivate them through the season, and we must keep them clean. Sometimes it takes considerable work. It takes anywhere from two to five hoeings during the summer to keep the plants clean, and it is considerable labor. Some men who have kept a record, have decided that it takes about 25 days' labor to make an acre of strawberries. Sometimes, during the winter, we mulch these plants, preferably with wheat straw. Once when wheat straw got scarce, some of the men mulched with broom sedge. It is not very desirable, but it has some qualifications that are very good indeed. We were bothered with cheat and wheat in the straw. The first year there was no trouble with the broom sedge, but we had trouble later with it coming up in the strawberries. But with the many cultivations, we got it out readily. We mulch to keep the berries clean, as there is no danger of the

plants freezing out. It takes about two tons of straw to the acre to mulch the strawberries, and a man who has to buy his bale of straw at the market price objects to mulching with it, but most of them grow wheat. It has made a demand for straw and raised the value of it. It has gotten to be as high as \$2.00 a load. It is quite a saving if you can raise the wheat on the farm and in that way we have made the wheat crop more profitable in our country. If the plants are clean, they require no further attention until picking time.

We have about two thousand growers in our association, and a thousand acres in strawberries. Every man who grows berries belongs to this association. The dues are 50c a year. We incorporated as a stock company, and while our stock has been subscribed, it has never been taken up and paid for. It is not a concern to make money. We have a board of seven directors who are elected once a year. These directors elect the president, vice-president and secretary and treasurer, and the manager is the "whole show." I am more impressed, everywhere that I study these questions, with the advantage of having a competent man as manager. We were able to get such a manager and he did not happen to be a farmer. There is no reason why a farmer should not manage it as well as anybody else, but we found this man who had been a fruit broker and he had had a good deal of experience in dealing with men, which is very important. We selected a gentleman in Bowling Green, and he has been our manager for five years. This man is paid for the services rendered. While he is only employed actually about six weeks, buying the crates, etc., some time is taken up during other parts of the year. We pay him 3½c per crate. If the crop is large, he makes as much as \$2,000 a year some years. He gives us value received. We are well paid for what we pay him.

We buy our baskets co-operatively. In January we get the growers together, get the number of boxes we want, and call upon the different firms in our territory and get bids, and the best bidder gets the order. We thought we could get these crates made in Bowling Green, but we could not. For the last three years we have been buying at Paducah; also at New Albany and in western Tennessee. The same way with the plants. We begin in the fall of the year and make contracts for the plants. We get the very lowest wholesale prices. We also buy fertilizers co-operatively, and save from \$2.00 to \$15.00 a ton. We have a little pamphlet which is circulated among the growers, laying down the rules and by-laws. Every man has to deliver all his strawberries to the manager, who has entire charge of them. When these berries are ripe, which is usually about the middle of May—the season lasting about four weeks—we have rules about the picking. Every man should grade his berries alike. We have three grades; what we call X, XX and

XXX. The last is the best or fancy grade, that commands the biggest price. The next grade is not so perfect, and we sell this at a different price, of course. The poorest grade does not go into the car at all. We have been fortunate in getting our growers to make very good packs indeed. We have a grader in each car, and only ship from one point. These berries are received on the car and are opened. If they have 100 crates, the grader opens one or two or three crates. If he finds them running up to standard, he grades them accordingly. We have two ways of selling the berries. That is, at home, on the track, or on consignment. Strawberries have to be handled very quickly. Our idea is not merely to try to sell the strawberries only, but we are trying to make the product so good that the buyers will want ours in preference to the other fellow's. Now, we have the buyers on the ground. We have sometimes 12 to 15 of them on the ground at once. We get \$2.25 a crate on track, and do not cut the price until the season is more than half over. We have been fortunate in selling these berries on track.

We have laid down some rules in regard to the picking. We all pay the same price for the pickers. We pay a fair price. There is no class of labor in our county that is better paid than the strawberry pickers. We give 7c a gallon, that is, we pay them 6c a gallon weekly, and if they stay till the end of the season, we pay a bonus of 1c a gallon. Some of the pickers pick a few weeks and drop out. If 25 of the pickers drop out, it is a very serious loss; so we use this plan to keep them, and it works very well indeed. Any boy or girl can make from \$1.00 to \$1.50 a day picking berries. Grown men and women sometimes make an average of \$2.00 a day. We had one man in our fields who picked 90 gallons of strawberries in a day, and made \$7.80, the rate then being higher than now. They earn from 25c to \$5.00 a day for picking berries. They have to pick them well. We have a man who stays in the field who is constantly going from one picker to another and watches the picking. The berries on the top layer are perhaps a little better than underneath, but the average box is about the same all the way through. We try to give the buyers a square deal, and if for some reason some grower gets past with some berries that are not quite up to standard, so that the buyer complains, we satisfy him and repay him. Sometimes we pay back several hundred dollars at the end of the season.

A year ago we sent our manager to the cities in which we sell—fourteen of the big cities in the east—to get acquainted with the trade. He spent several weeks in the east visiting these cities and came back with a very encouraging report. The wholesalers said to him: "Your berries are the most satisfactory we have ever gotten." This is because they are standardized.

About the profits. Like everything else, they vary a good deal.

About the best yield we have ever made is 200 crates per acre, but we have had growers grow 250 crates. I believe we could grow 250 with better fertilizers, etc. The average grower plants from 5 to 10 acres, making about 150 crates to the acre in a normal season.

Now about the time we let them stand, and how we work out the old beds. We thought at first that three years would be the limit, and of course we get the best grades the first and second years. Recently several of the best growers have been leaving their beds four years very profitably. We have come to the conclusion that if the beds are kept clean, we can run the strawberries four years. I find that the best growers are netting, outside of the picking and crating, about \$150 to \$175 an acre. That does not include the straw and cultivation or the fertilizers, nor the rent of team, making the cost about \$10 an acre for the plants.

Q. How much phosphate did you use?

A. About 500 lbs. to the acre.

Q. Did they grade the strawberries as they gathered them?

A. Yes.

Q. Do you use fertilizer after the first year?

A. Yes, the second and third years.

Q. What do you use, and how much, after the second year?

A. Phosphates, about the same amount.

Q. Is your soil sandy?

A. No, red clay soil.

Q. Do you plow out the rows the second year?

A. Yes, just as the first year. The new plants come out on the sides and take root while the old plants are still there.

Q. Do you cut the runners off any?

A. After they grow out about 8 or 10 inches, we keep them that way.

Q. Do you use a runner cutter?

A. Yes, we have.

Q. Have you used any pedigreed plants?

A. Yes, but there has not proved to be anything in it.

Q. How deep do you mulch them?

A. Just according to how much straw we have.

Q. Do you use fresh horse manure in the fall?

A. It would not be desirable.

Q. Do you use a manure spreader?

A. Can't say that it's any better.

Q. Do you try fall planting?

A. Not much.

Q. When do you put on phosphate?

A. Before planting, if the land needs it. After the first year we apply it in July or August, in time to produce a good growth of plants.

Remarks by Prof. J. H. Carmody.

We find that there is a great deal of money being spent on commercial fertilizers. I am interested in certain parts of Missouri where they are experimenting and have figured out that about the only commercial fertilizer is phosphate in one form or another. We believe that the same conditions apply to Bowling Green, and this spring we are going to outline a series of tests with the Bowling Green growers, using a number of different fertilizers in order to determine just what fertilizer is needed, and we hope that in another year or two we will have some splendid results to show.

LESSONS FROM THE PACIFIC NORTHWEST FOR KENTUCKY APPLE GROWERS.

W. B. Lanham, Horticulturist, Columbia, Mo.

I believe that I am safe in saying that no other section of the country produces such a high class apple, nor receives such a high price for it, as do the growers of the northwestern states, especially the group composed of Oregon, Washington, Idaho and Montana, known as the Pacific Northwest.

Are these states peculiarly adapted to culture of the apple, to the extent that other sections of the country cannot compete with them? Do they have such a distinctive soil that produces the marvelous color and size of the Oregon Spitzenburg, or is it the cool nights and bright sunshiny days of Montana that brings out the color and flavor of the Mackintosh until it is known as the Montana Mackintosh Red? Is it these gifts of nature alone that we have to thank, or do the methods of culture and care and the systems of grading and marketing have something to do with it?

When I first went west—about 7 years ago—I found growers who actually believed that their own little particular valley produced the best fruit of any place in the world. I say some of them really believed it. Most of them, though, when they thought they had you convinced that theirs was the only favored spot on God's green footstool to grow apples, were ready to show you the particular tract they had for sale.

There are sections that seem to be peculiarly adapted to growing certain varieties. Hood River is known for its Newtowns, Spitzenburgs, and Ortleys; but especially for its Spitzenburgs and Ortleys; and more especially for its Ortleys. The Rogue River Valley has gained fame from the excellence of its pears and Newtown apples. The Yakima Valley claims it produces the best Spitzenburgs, Rome Beauties, and Winesaps. Wenatchee claims supremacy for the superior quality of its Winesaps, Jonathans, and Delicious, while Montana pins its faith to the Mackintosh Red. So we see the rival claims overlapping. Sections with entirely differ-

ent soil and climate frequently claim to produce the same variety par excellence. This leads one to wonder if perhaps there might not be some other factor besides the natural—I started to say advantages, but will qualify that to resources—of the northwest. If the methods of operation are a contributing factor, then cannot they be adapted to the needs of Kentucky growers? I believe they can. There is no denying the fact that parts of the northwest have soil and climate that are especially adapted to apple culture. More than that, the people are hustlers. They make the raising of fruit a business, not a side issue. It is what many of them pin their entire faith to and put all their energies and resources into. They simply have to succeed.

Most of the sections are settled with people from the middle and eastern states. It is not the natives that are the hustlers and boosters. Many of the most successful fruit growers of the Pacific Northwest knew nothing whatever of the business when they entered it. Some of them were professional and business men from the cities, but they realized they did not know it all and were willing to take the advice of growers who had already made a success of the business, and follow their methods. And all were willing to get down and hustle.

Outside of the natural advantages that the northwest may enjoy, it seems to me there are four or five factors that contribute largely to the almost phenomenal success of this section. These are:

- Personality of the grower;
- Varieties grown;
- Care given in producing the fruit;
- Harvesting and marketing;
- Advertising.

Personality of the Grower.

I have put personality of the grower first of these factors, for I am not sure but what it is the most important, for after all, the other factors hinge on this. The northwestern fruit grower first, last, and always, is an optimist, a booster, an egotist. He believes, and has no hesitancy in saying, that his particular section is the only place to grow fruit. He meets the newcomer with a glad hand and is always willing to show him around, pointing out the superior advantages of his locality and particularly of his own orchard.

Business methods are applied from the start. Co-operation is practiced from the buying of supplies to the marketing of the finished product. Horticultural societies are organized in every little hamlet, and they do not simply meet once every year, but hold meetings every month or oftener. Their membership is not limited

to the growers alone. The business men take an interest. They realize that the success of the fruit grower means their success. They are just as ready as the producer to boost the products of that section. You will find the windows of the banks, real estate offices, and even the dry goods and jewelry stores decorated with apples. They talk apples, think apples, and dream apples.

The very successful ranches, as they term them there, are mostly small. It seems rather odd to a tenderfoot, at least it did to me, to hear a five or ten acre orchard spoken of as a ranch. But that is the term they generally employ. From five to forty acres is the usual unit, and it is more likely to be the former than the latter. With these small tracts the owner can give his personal attention to each individual tree. Little is left to the hired man. Some of the most successful and wealthy growers employ practically no help in their orchard except at pruning, spraying, and harvesting time.

Varieties.

When fruit growing was first started in the northwest, most of the varieties commonly grown in the east were tried out. It was noticed that in some sections certain varieties reached a degree of perfection not found in other places. The growers were quick to take advantage of this fact and limited their future planting to the varieties that obtained this high degree of excellence. Most of the prominent fruit sections are limited to not more than four and some of them to even one or two varieties that they make their leaders. Many places can grow a number of varieties successfully, but they can grow one or two varieties better, perhaps, than any other place and they stick to these and advertise the fact.

The selling organizations take advantage of this specialization and advertise certain varieties as having been produced in the section known to grow them to the highest degree of perfection. Formerly, before there was a central selling organization, each local union bid against the others in the market and probably two or three different sections would be claiming to raise the best apple of a certain variety. But since the organization of the Northwest Fruit Distributors, there is an understanding whereby certain sections are given advantage on the market for certain varieties. For instance, the Ortleys raised in Hood River are offered to the trade at a higher price than Ortleys produced in any other section. The Mackintosh Red raised in the Bitter Root Valley in Montana brings a higher price than that variety grown in any other section. The Rogue River Valley Newtowns bring more on the market than any other Newtown pippins.

Care.

In the best orchards of the Pacific Northwest no detail of care is neglected from the time the tree is first purchased from the nursery until the fruit from the mature orchard is packed and delivered at the association warehouse. Few orchardists now buy their nursery stock from the itinerant tree peddler. If it is purchased from a traveling agent at all, the buyer is very careful to ascertain the reputation of the nursery represented. Where the planting is large enough to justify it, the nursery is usually visited and the stock inspected while growing.

A certain block or row can then be selected and all the trees of the desired grade reserved and shipped from that particular section of the nursery. This is much the better plan. The purchaser can then see exactly what he is getting, and if he is there, as he should be, at the time the order is filled and the stock packed, he is sure there will be no substitution.

When I had charge of large plantings in the northwest, I made it a rule to visit the principal nurseries in the late summer or early fall and inspect the stock while still standing in the nursery row. Most of the leading nurseries of the northwest were inspected before the order was placed. Often we would buy as many as 80,000 trees during one season.

At digging time I would again visit the nursery and inspect the stock as it was packed. We have a very rigid law in the western states for nursery inspection, so far as insects and diseases are concerned. However, the inspector has nothing whatever to say about the grading as to size or any possible substitution of varieties. He doesn't have authority to reject a broken tree or even one with no roots. His duty is simply to look out for the spread of any injurious pests or disease, and it is up to the purchaser to see that he gets what he orders. No doubt nurserymen are as reliable as any other business men. Yet in purchasing any goods, I find I get better service where I look out for my own interests personally.

Many growers now do not depend on the nursery for their stock but propagate it themselves. There is also a lot of interest being taken in pedigreed trees. One development company that is selling land in small tracts and developing the orchard to the bearing age, has its own nursery and plants only pedigreed trees. This is stock propagated from trees that are known to have produced large crops of superior fruit over a long term of years.

You, perhaps, have often noticed that in an orchard there will be a few trees very much superior to the rest. While all the orchard may receive the same care, there will be trees that will bear regularly and heavily for no apparent reason. There is just as much difference between these and the rest of the orchard as there is between a pure bred and a scrub animal. Does it not stand to reason

that buds or scions taken from these trees stand a better chance of producing others that will bear regular crops of fruit above the average than if the stock was propagated from scions taken from the ordinary orchard pruning?

This development company had one of its horticulturists visit all of the principal orchard districts of the Pacific Northwest, and when he heard of an orchard or tree producing large crops regularly, of especially good fruit, he investigated the reports. Where these claims were substantiated, he secured the exclusive rights to propagate from that tree and marked it with a numbered metal tag. Scions were only taken from trees where the owners would make affidavit to the crop produced for at least three years back.

Every precaution was taken to prevent the scions getting mixed. The number of the tree, with its history, and the name and address of the owner, was registered. Each package of scions was carefully tied up separately and sealed with wax and numbered to correspond with the register number. The seals were broken only by the foreman in charge of the grafting room, and scions from two trees were not allowed on the table at the same time. Like precaution was extended to the nursery row and then to the trees when planted in the orchard. Each orchard tract was carefully platted and the plat registered, the same registry number being used throughout. When these trees come into bearing, it will be very easy to trace back and see if there is anything to heredity in fruit.

Some nurseries now are advertising pedigreed trees. If we are willing to pay the price for the extra care, in time we should have orchards in which every tree should produce equal to the best we are now growing. The price of nursery stock is such a small proportion of the cost of growing an orchard that many growers feel that it is money well spent, even if the cost is ten times that of ordinary stock. Perhaps all of us cannot yet demand pedigreed trees, but we can insist that they be propagated from bearing trees that are true to type.

When I bought a quantity of trees, I had the nurseryman sign a contract agreeing to top work, at his own expense, any of the trees that were not true to name when they came into bearing. Under such a contract the seller will be very careful about any substitution. I believe some of the western states now have this in their horticultural laws.

It may strike some of you as inconsistent for me to state that most of the Pacific Northwest orchards are small in size and then speak of buying 80,000 trees for planting in one season. The land on which this stock was planted was owned by a development company and sold in tracts of from five to twenty acres. Many of the purchasers were professional or business men of the middle west

and some even the extreme eastern states. They did not feel inclined to give up an established business to develop a small orchard, so they entered into a contract with the selling company to plant and care for their holdings for a period of years, usually from four to five, at which age they were supposed to begin bearing.

Until a few years ago it was the practice to give clean cultivation at least until the orchard reached the bearing age. The land was usually broken in the spring, deep, and surface cultivation was given throughout the growing season. In the well cultivated orchards not a weed could be seen at the end of the cultivating season. This practice produced an enormous wood growth and made a fine appearing orchard. It was practiced especially by development companies who were selling orchard land, and the orchards given this care certainly presented an appearance that would tend to separate the uninitiated from his money.

Many of the growers, at the present time, are not giving clean cultivation exclusively. If they cultivate at all it is only during the growing season, and at the last cultivation a cover crop is sown to protect the soil during the winter and provide humus to be turned under in the spring. From the orchards I have seen in the middle west I hardly think it necessary to say anything against clean cultivation as it does not seem to be practiced at all.

There are two or three methods of cultivation in vogue now, some of them modifications of the clean culture method. If the orchard at the time it is planted is especially rich in humus it may be given clean cultivation during the growing season, for a year or two, without serious injury even if no cover crop is sown. Cover crops are then sown and turned under and a little later nurse crops are planted. These are mowed and left to rot and mulch the ground and the orchard receives no cultivation at all. Where there is plenty of water available for irrigation this practice is very successful. Where there is not an abundant supply, in order to have enough moisture to mature the fruit, it seems to be necessary to cultivate during at least a portion of the growing season.

Much more attention is given to pruning in the northwest than is the custom in any other orchard section. Most of the trees are pruned to what is known as the vase or inverted cone shape and practically all are headed low—from twelve to twenty inches above the ground. Even in the bearing orchard, much more severe pruning is practiced than is the case in this section. Trees are never allowed to form such dense heads that the sunshine cannot get in and color up the fruit. I am convinced that one reason fruit is not more highly colored here is because of the dense heads. To secure red apples it is absolutely necessary that they be exposed to the bright sunlight.

Thinning is very extensively practiced, and though it is somewhat of an expensive operation it is found cheaper to harvest the fruit in June than in September.

Just after what is known as the June drop, the trees are gone over and only one apple is left on a fruit spur, and these rarely closer than six inches. Compared with the amount of fruit left on the ground, it looks as if there were few left on the tree. Before picking time, however, the branches are so laden that they have to be supported by props. A tree can only mature a certain number of bushels of fruit, and there is more profit in having apples that will pack 96 to the box than where it takes 200 or more to make the same quantity. This thinning partially accounts for the enormous size of the northwestern fruit. I am not sure that thinning, to the extent practiced in the northwest, would be profitable here, but I do believe the trees that seem to have more fruit than they can properly mature, could be pruned after the June drop and a portion of the fruit removed in this manner, at a very low cost. Or some of it could even be shaken off. There is certainly no profit in a tree that can produce only, say, ten bushels having these ten bushels of fruit the size of marbles, when three-fourths of it could have been removed and the same quantity harvested of large first class apples.

When the trees are thinned and only a portion of the fruit spurs allowed to set fruit each year, there is not so much talk of "off years" as we hear in some other parts of the country. In fact, there is practically never a complete failure in the northwest.

One thing that struck me as rather peculiar, not particularly here but in other places that I have visited in the middle west, was that some people thought they were being especially up-to-date by spraying. No grower would attempt to produce fruit in the northwest without spraying. It is as much an orchard practice as pruning or harvesting the fruit. While we may not have as many diseases and insects to combat as in the older orchard regions, yet the ones we have, if not kept under control, are very destructive. In many sections the San Jose scale, and in some places the Oyster Shell are very bad. Also both the Green and Woolly Aphis and, with the exception of one region, the Codlin Moth, I think, is as bad as it could possibly be here. Probably our worst fungus disease is the apple and pear scab.

Power sprays are used almost exclusively and a pressure from two hundred to two hundred and fifty pounds maintained. Thoroughness is the watchword. The growers know what they are spraying for and what sprays to use. They do not simply spray because they are told to, but they know the composition of the spray and the results to be expected. They do not get a little hand pump and stand off and squirt some juice at the tree, but the work is done intelligently and thoroughly.

In a commercial orchard district even the family orchards have to be sprayed to a certain extent, no matter what the owner thinks of it. The laws in most of the northwestern states provide that where an orchard is infected with certain insects or diseases and the owner refuses to spray and clean up his premises, the inspectors have the power to do the work and it is charged up against the owner and collected with his taxes. Even in the towns the trees are sometimes so badly infested with scale that it is necessary for the inspection service to provide power sprayers and spray the few trees in the back yards. A man either has to take care of his fruit trees or cut them down. If he refuses to remove them, the inspector will, and that is also charged and collected the same as taxes.

By far the most destructive disease the grower on the Pacific Coast has to contend with is the Fire Blight of the apple and pear. This is caused by a minute organism that lives in the inner bark where no spray can reach it. The disease is confined almost exclusively to pome fruit. The pear is supposed to be the most susceptible, but in the Pacific Northwest, it is almost as destructive in some varieties of apples as in the pear.

The appearance is first noticed as blossom blight. The blossoms wither away and the twigs and young leaves blacken and die as if the orchard had been struck by fire, hence the name Fire Blight. In many cases the disease goes no further than the blossom or fruit spur. In others, and especially in some varieties, it goes on down the limb and may either kill the branch entirely or kill only a portion and form what is known as canker. These cankers carry the disease over winter. As soon as the sap starts to flow in the spring a sweetish liquid, containing myriads of the bacteria, is exuded from these cankers. Bees will suck this juice and then fly to flower clusters and inoculate them. Other insects also carry the disease, but most of the blight is supposed to be transmitted by bees. However, aphids are fond of this juice and when they suck the sap from the rapidly growing twigs or branches, may inoculate them with the blight.

One fertile source of inoculation is careless cultivators. The top of the hame may strike a canker and later break the bark of a healthy tree and allow the germs to enter. The bacteria cannot get through the old bark except through a wound, but must be carried into a blossom or through the soft, sappy, rapidly growing water sprout.

Blight spreads much worse in a rapidly growing orchard than in one that is making little growth. Perhaps this is one of the reasons it is so much more destructive in the orchards of the coast where they have good cultivation than in ones that have not such good care. Careless pruning has spread this disease as much as any one thing. The pruning tools may cut through a canker and then inoculate healthy wood. If there is blight in an orchard, the

tools should be disinfected after making each cut. Corrosive sublimate dissolved in water, one to 1,000, makes a good and cheap disinfectant. It is a deadly poison, however, and must be kept out of the way of children.

The only successful method of controlling this disease is to cut out and burn the infected parts. Sprays have no effect other than they may kill the insects that carry it. Blight cures are worse than useless. I say worse, for they leave the disease to go on unchecked and may even spread it by means of the tools used to administer the medicine.

The canker should be cut out in the fall or early spring. The fall is the best time as all infected branches can be detected by the unhealthy foliage. Bees and insects may carry the bacteria long distances, so when blight appears in an orchard all growers in that district should co-operate in trying to stamp it out.

Harvesting and Packing.

There is probably no one thing that makes the northwestern fruit more distinctive than its grade and packing. All the apples are shipped in boxes. There are two sized boxes used—the Standard and the Special. The inside measurements of the standard is $10\frac{1}{2} \times 11\frac{1}{2} \times 18$ inches, with a cubical content, without distention, of 2173 cubic inches. The inside dimensions of the special are $10 \times 11 \times 20$ with a cubical content of 2200 cubic inches. The standard Winchester bushel contains 2150.4 cubic inches, so the western apple box is just a trifle larger than the standard bushel. Also, they are packed with a half to three-fourths inch bulge of top and bottom, that adds about 150 cubic inches more to the contents.

From the low headed tree a large portion of the fruit can be picked from the ground. When I say picked, I mean hand picked. There is no shaking of apples and then picking them up from the ground, in western orchards. If an apple is accidentally dropped, it is a cull. The fruit is carefully picked off by hand, placed in the picking basket and laid, and not poured, in the orchard boxes. These boxes are about one-third larger than the shipping box and have cleats on top of the ends so they can be stacked on a wagon or in the packing house without bruising the fruit. A few growers use their shipping boxes to pick fruit in, but this is not recommended, as the boxes are almost sure to be soiled, and to present the best appearance a box must be bright and clean.

After being picked, the apples are sorted and if they were sprayed late, they are wiped. This is usually done with a pair of soft canton flannel gloves, and it is not nearly so laborious and expensive an operation as one might think. By wiping I do not mean polishing, but simply removing any spray or dirt.

Most of the packing is done at the grower's own packing house, although in a few sections there is a central packing house and all of the fruit is hauled to this in orchard boxes. Very rarely are growers allowed to pack their own fruit. If a fruit grower is also a packer he is usually sent to some other place to pack, for it is pretty hard for a man to see the defects in his own fruit.

The packers are employed by the association through which the fruit is shipped. They are sent in crews of from four to six, under a foreman, to the orchardist, where they are boarded and do the packing. The owner is expected to furnish boxes, paper, packing tables, etc., and to keep the tables supplied with fruit, and nail up the boxes. The packers are held strictly responsible for the pack, but the grower is responsible for the grading. The packer is responsible to the association and not to the grower. The usual compensation for this work is 5c a box and board, or an average of from \$2 to \$3 a day and board. It is difficult to obtain enough skilled packers to handle a normal crop. Most fruit sections now annually hold packing schools just at the beginning of the harvesting season.

The boxes are lined with paper and have a cardboard on the bottom and top and in the fancy and extra grades each apple is wrapped separately. These wrappers often are printed with the grower's name or the name of his ranch. The ends of the box bear a lithograph giving the variety, name of the shipping association, and name and address of the grower. There is also marked on the end of the box the grade, the number of apples in the box, and the number of the packer who did the packing. Before being allowed to pack for an association, each packer must register, and is given a numbered rubber stamp with which he has to stamp each box packed by him. Any defective package that may escape the inspector at the shipping end, in this way may be traced directly back and the responsibility fixed.

Marketing.

The production and marketing of fruit should be considered from the same angle as any other business enterprise. No manufacturer of any size would expect the same person to take care of both the production and selling end. Is not the growing of fruit a manufacturing business? We have the raw material in the shape of soil, fertilizers, water, etc.; the tree is our manufacturing plant, and the fruit is the finished product. Why should not this be handled as any other business? If we are to grow the finest quality of fruit, and in this age of competition it is necessary that this be the grade produced if we are to make any money from it, it is about all the average man can do to attend to the growing, without also having to be a salesman. Most fruit growers have not a sufficiently large

plant to employ a sales force individually, so the only solution is to co-operate with other growers.

In the height of the marketing season it is very desirable, and almost necessary, that the shipper be informed every day by wire of the condition of the markets; which markets desire fruit and what kinds and the ones that are over supplied. When the northwestern fruit was first shipped to New York and Chicago, it was so much superior to what was on the market, that it brought almost fabulous prices. The next year, on the strength of these prices, everyone who had good fruit to ship sent it to these same markets, with the result that they were glutted and the smaller markets neglected. A grower acting individually has no way of knowing these conditions. With a strong marketing organization, reports can be received every day from the principal markets throughout the country, showing just what they demand and what prices can be obtained. They are also in a position to look up the standing of the purchaser, his financial rating, etc.

Not only is it necessary to know what the markets demand, but it is desirable to know what the other fruit districts are doing; what fruits they have for market, and where they are shipping it. If an individual in North Yakima and one in Hood River and one in Wenatchee, for instance, all have a car of the same variety to ship on the same day, unless they have some knowledge of what the other one is doing they may all ship to the same point at the same time and it might be that they would ship to a market that could only consume one car. This practice results in the demoralization of that market, whereas, if the three cars could have been properly distributed, cities that would otherwise have been neglected, are supplied and a good price realized on all the fruit.

There are several kinds of marketing organizations, but the most successful is the co-operative form. Members are usually limited to one share of stock and only the stockholders' fruit is marketed. The idea is to do the marketing for the members at cost and pay no dividends. There is usually charged a stated amount per box for operating expense. At the end of the season, if there is a surplus after taking care of a sinking fund, the remainder is pro-rated to the growers according to the amount of fruit shipped by each. This has been found very much more successful than a stock company where the largest portion of the stock might be owned by one or two persons, and they perhaps not growers.

The co-operative plan is often spoken of as the Hood River plan. Hood River, Oregon, established the first really successful apple shippers' association, known as the Apple Growers' Union. For several years Hood River had been growing a good quality of fruit but the individuals had different ideas of grading and packing, and many of them had comparatively small acreage in bearing. Only a few could afford to ship in car lots, and the markets consequently

were limited to the immediate locality. As more orchards came into bearing, the prices had been steadily dropping and the business was in a precarious condition. In 1902 they realized on an average of 80c a box for their fruit. The following year the Hood River Apple Growers' Union was organized and a majority of the fruit marketed through it. The returns were \$2.00 a box f. o. b. shipping point. In 1904 it brought \$2.10 a box and in 1905 \$2.60, on the average. So successful was this organization that many other districts organized on the same plan.

Whenever an organization such as this establishes a price for the product of that locality, the growers who are not in the association benefit also, and for this reason it has been very hard to get a number of persons to join. The general farmer is the most individualistic of men and is generally the hardest to get to act co-operatively. He is used to doing practically everything for himself and seems to dislike to have anyone else take charge of any phase of his business. In a measure, this has been overcome in the western fruit growing sections and the strongest marketing organizations in existence are to be found there.

These associations were at first very bitterly opposed by certain commission men and they used all sorts of means to defeat them. One of their ways was to offer some weak-kneed grower a little better price than the union was selling for and have him break loose and ship individually. It was then pointed out that the individual was getting a better price than could be secured through the association. Sometimes this was systematically followed up for a number of years and added to the difficulty of holding these associations intact. In organizing such a selling association it is necessary that a very stringent contract be drawn up between the organization and the grower. He is usually bound to ship his fruit through the association for a number of years, with the privilege of withdrawing at the beginning of any year. It is necessary that the management know before the season begins what tonnage he can expect and what proportion of the crop will be shipped through the association, before he is in a position to do any business at all.

This opposition to the unions on the part of the buyer has in a measure disappeared. They find that it is often better to buy through an association as they can then secure any quantity of fruit of any variety that they desire, of any particular grade. For instance, if a man wants a car load of extra fancy Spitzenburgs that will pack from 80 to 96 to the box, he can secure this through an association, but it probably would be impossible for any one grower to furnish him exactly what he wants. Also he knows that he will be protected in the matter of price when he deals with an organization. If he is asked \$2.00 a box for a certain grade he knows that the next buyer will have to pay that same price, and if there is any

change in price made they will all be notified. In dealing with individuals this is not very often the case. It was formerly a practice of the buyer to go into a certain locality and find some man who was not very well informed as to price, or not a very good trader, and beat him down and secure his crop at a very low figure, and then use this as a basis to attempt to buy the rest of the crop. Nine cases out of ten it was successful.

For an association to succeed it is necessary that a good manager be employed. It is too often the case at first that some member of the association is employed as manager, many times because of his failure in every other business. With such a start it is almost fore-ordained that he will also fail in this.

When apples are graded according to association rules it is possible to have a uniform grade throughout the district. This would not be the case if individuals were left to establish their own grades. Every grower, of course, thinks he has the best fruit in the section and what to him might be Extra Fancy might be Fancy or "C" grade to some other grower. A grade can also be established that will not vary from year to year. One of the things that has made the Hood River Association so successful is the fact that from the first their grade was standardized. If a person buys a box of Hood River Fancy Apples this year and wants a box just like it next year, he can be sure he will get absolutely the same quality of fruit, or if there is any difference, he will get a better quality, for the grade and pack has been gradually improved from year to year.

There are successful growers' associations in all fruit districts now, but until recently they were acting individually and competing against each other in the markets. Two years ago there was formed a Central Selling Association known as the North Pacific Fruit Distributors, embracing most of the fruit districts of Oregon, Washington, Idaho and Montana. This main office has nothing to do with the grading, picking, packing, etc., but attends entirely to the selling of fruit and buying supplies. The Central Association formulated rules by which the grading and packing are to be done, but the enforcement of these are left to the district and local associations. This organization now controls about 60% of the output of these four states and they are able to have a say as to the price the fruit shall be sold for.

Advertising.

Within the last few years there has been a very large increase in the area of apples planted in the northwest and as this comes into bearing it will be necessary that a wider market be found for the product. This must either be done by exploiting new markets or by increasing consumption in the old ones.

The citrus growers took care of their largely increased output

by increasing the consumption in the U. S. and Canada. They did this by systematic advertising. You cannot find a village or hamlet in the country but what is well supplied with citrus fruit and at a reasonable price. The retailers are not making the money per box that they once did off of oranges, but where a few years ago they sold one box they are now selling ten. The principal reasons for this is the advertising done by the growers and by their strong organizations, compelling the retailer to handle the fruit on a reasonable margin of profit.

The fruit growers, especially in the northwest, are now beginning a systematic advertising campaign in the newspapers and magazines. This year all apples sold through the North Pacific Fruit Distributors were taxed one cent per box for advertising.

A year or so ago, the head of the Domestic Science Department of the Washington State College published a pamphlet giving 209 ways for serving apples. This is distributed free of charge by some fruit growers' associations.

While something has been done in the way of advertising, yet the campaign has only begun. You can hardly pick up a paper or magazine without reading an advertisement of the Sun Kist Orange of California. It is up to the apple growers to bring the apple just as prominently before the people. The great mass of the consuming public hardly know one variety from another. They only know that one apple is red and another is yellow. They know little about what season a certain variety is at its prime or what apples are best suited for cooking or for eating.

Many apples shipped from the northwest this year have a notice in the box stating when the fruit is at its best and whether it is better as a dessert or cooking apple. We must continue the publicity and educational campaign and this is one thing, at any rate, that the northwest fruit grower is not alone concerned in. It is of interest to fruit growers throughout the entire country. It is something that dealers and growers over the United States and Canada can co-operate in. Another thing that we hope to accomplish by this advertising campaign, and through better market facilities, is to so control the output as to in some way induce the retail merchants to push apples and be willing to accept a fair margin of profit.

You will find the grocery store windows full of oranges that you can buy almost, if not quite, as cheaply as apples, and yet fruit growers all over the country complain this season that there was no money in raising apples. The retailer does not push the sale of apples and when he does sell them he wants to make from 100 to 200% profit. A few days ago I went into a store in Columbia to buy some apples and saw some Washington Ben Davis packed in boxes. They were not a very good grade but they were wrapped and well packed. I asked the price of them. "Two for a nickel." These

apples were about 128 to the box, which would make them retail at something like \$3.00 a box. In order to find out what profit the dealer was making, I posed as a northwestern grower and tried to sell him a car of apples. He admitted these cost him 80c a box, making over 200% profit he was asking.

We hear so much about the middleman, and while there are no doubt plenty of crooked commission merchants, yet on the whole, I am convinced it is not the commission merchant who is making the great difference in price between the grower and consumer, but it is our own retail merchant. And just as long as he can buy from the individual grower and there is no strong association to say he shall not charge exorbitant prices, he is going to make as large a profit as he can. This means he will sell very few apples but will push the sale of oranges that he has to sell in large quantities to make any profit.

Judging by the publicity the northwestern states receive, one would judge their output to be much more than your own state. Kentucky is not usually spoken of as a leading apple producing state and the following figures taken from the last census may be a surprise to you. They were to me. This census says there was produced that year in round numbers in

Idaho	659,000 bushels of apples
Montana	567,000 bushels of apples
Oregon	1,930,000 bushels of apples
Washington	4,225,000 bushels of apples

Or a total of 7,381,000 bushels. In the same year Kentucky alone produced 7,268,000 bushels of apples, practically as much as the four great northwestern apple states combined. But no one heard of Kentucky's output, and why? She did not advertise and the northwestern states did.

I know you can raise good apples here for I have seen and tasted them. Perhaps they may not have the superlative finish that we get in the northwest but they make a good appearance and certainly have the flavor.

Good as your fruit is, you can make it better, especially in looks. Thin out the dense heads of your trees and let the sunlight in. It won't hurt them. You will be surprised at the color the fruit will take on and how much less you will be bothered with fungus diseases.

When you plant a new orchard, find out what varieties do best in your particular section and confine yourself to only a few of the best. Do not attempt to grow all in the nurseryman's catalogue. After they are planted, give them good care. Remember you must take care of them now if you expect them to take care of you later.

In the northwest we do not ask if spraying pays. We know that it does and that it does not pay to attempt to grow fruit without spraying. If you spray thoroughly you will reach the same conclusion. Get advice from your experiment station, when to spray and what materials to use, and then do the work thoroughly. I cannot emphasize this too much. It is almost money thrown away to spray unless the work is done well.

When you have raised this crop of fine fruit carefully harvest it. Cull out the poor stock and grade the rest according to size. You will get as much out of the small stuff alone as if the larger was mixed with it, and the extra price for the large fruit will be clear gain. If you cannot advantageously market what you raise individually, co-operate with your neighbor. You can then have a sufficient quantity of good fruit to attract the attention of the buyers, and when you have once won a reputation for an honest pack you can almost demand your own price. And don't be afraid to tell the trade that you are putting this fruit up just a little better than anyone else and that you expect to get a better price for it. Toot your own horn! Put your business on a high commercial plane and other people will look at it the same way you do. Talk apples, think apples, dream apples, and you will make the northwest sit up and take notice.

EXPERIENCES IN TOMATO GROWING AND THE TOMATO CANNING CLUBS.

O. B. Burrell, Owensboro, Ky.

This is a very important subject. I think perhaps the Kentucky club work has done more for the south than any other project of extension. We do not realize how much of the backwardness of the south is due to improper food. Unless a man has good food, he has not the inclination, either mental or physical, to do good farm work. Food is especially bad among the poor people. Pork fat and corn bread does not fit a man to work well.

The Kentucky club work has been very successful. I suppose you understand what it is. We have a county agent—a girl, usually appointed in the county—to have charge of the clubs. They establish clubs with girls from the ages of ten to eighteen years. They all agree to cultivate one-tenth of an acre in any fruit or vegetable. It is not only a tomato club. We had 140 girls and some adult women belonging to the clubs this year. The girls put up over 10,000 cans of tomatoes. The women put up a number of fruits and vegetables for home use. The girls canned 715 cans of fruits and vegetables. Commercially, the work has not been as successful as the girls hoped. The average profit from 1-10 acre plot, this year, in our county, was

about \$15.00. The girl who took the county premium sold \$76.00 worth of fruit besides having some material for home use.

As to enrolling these girls, we went into the schools three or four different times before we could persuade them that they wanted to belong to the clubs. But we got the clubs organized and they succeeded in getting a small amount of money to have a local woman take charge of the work. Later in the season, two other girls were appointed as her assistants. But even then we had so many members we could not supervise the work very carefully.

It is necessary to transplant the tomatoes once or twice. Many of the girls transplant just once, to their permanent places. Some of the girls planted in tobacco beds and cold frames. The ground in Daviess County is a sandy loam. Phosphorus is the most necessary element of the fertilizers required. Manure is a good thing if put on early in the season. It is not a good plan to put on large quantities of manure just before planting, however. In a damp season, staking is advisable, but in dry weather it is not practicable as it leaves the plants so exposed to the sun that they dry out and burn. They use tobacco stakes and let one sucker come from the plant, about $3\frac{1}{2}$ feet tall.

I want to make just a few recommendations. If you are starting clubs in your county, get them to plant other things besides tomatoes. It is a good plan to plant peas first, on perhaps half the plot of one-tenth acre, and then set the tomatoes, and also raise corn and beans, and some fruit. All of these can be profitably sold. Another important thing is to get the best kind of seed.

Q. How do they get the peas out of the hulls successfully?

A. By the fingers. The girls are allowed 10c an hour to hull.

PLUM GROWING AND PLUM VARIETIES FOR KENTUCKY.

W. H. Clayton, Boone County.

The statement was made here, from statistics gathered in 1909, that Kentucky produced better than 7,000,000 bushels of apples. I venture to say that not more than 10% of the trees bearing these apples had been sprayed, and not more than 10% pruned. And I venture to say also that not more than 25% of these 7,000,000 bushels of apples were marketable at all. I know that in some sections of Kentucky, the apples are allowed to rot on the ground while, later on, we pay for the northwestern apples enormous prices. That is the fault of the Kentuckians, and we do not make good use of our wonderful opportunities for growing fruits, and our wonderfully cheap lands. Up in the mountains of Elliott County, I found a preacher who was growing and marketing a hundred dollars' worth of apples from each acre of land he had, and the land around him was selling for from \$3 to \$5 an acre. He claimed the price of his land was his only expense, except the cost of the barrels.

Almost everywhere I go, people tell me that plums cannot be raised profitably in Kentucky; that they are difficult of cultivation; that we do not have a ready sale for them. This is true. We have not a ready sale for our apples. There is just a certain amount of care and attention necessary to raise plums in Kentucky, as anywhere else. We can raise plums commercially here with profit, as we can raise all kinds of fruit profitably. We have the open door to the north and south. We have our wonderful waterways and our ever-increasing railroad facilities. We can ship our early apples north and our late apples south, and the same is true of the plums. We can reach profitable markets with whatever we grow.

By careful attention to our plums in Boone County, and anywhere else, we can make a profit of \$4 or \$5 per tree, and they are set about 16x18 feet apart. It is necessary to know just what kind of tree to set, and to give it the proper culture. Among our fruit trees, I believe that, next to the peach tree, the plum will respond most readily to good treatment. Yet the plum will give you good results under a system of neglect that would ruin other trees. Under proper cultivation and proper pruning and spraying, the plum tree may become a very profitable tree to grow on the farm for a commercial proposition, but I do not preach that. I think that every man owes it to himself and to his children to plant fruit trees. The man who brings up his family on hogs and hominy cannot expect much more than hogs when he puts his boys out on the country. If you want to keep the boy at home, you must give him some of the luxuries of the home.

It has been said that plums rot badly in Kentucky. We can control that absolutely. It has been said that the curculio has been very bad here. You can absolutely control it by spraying. It needs thorough work, but the benefits of spraying are cumulative.

As to varieties of plums, well, I do not like to say much along that line. One variety may do well in one section that would be almost a complete failure in another. I can only mention a few that I have seen growing well. We have the German Prune, which is very successful, as is the Vogel, which is almost a non-rotting kind. It is a good eating plum for Kentucky. We have the Summer Damson and Winter or Sweet Damson, and also the Yellow Damson. I can get 40c a crate (24 qts.) more for blue plums than I can for any other plum. Shipper's Pride is an excellent plum. Then we have the Green Gage and the Bavay. The Saratoga is an excellent red plum. Comes into bearing very young and bears enormous crops. It is fine for cooking or eating. We also have the Niagara. This is one of my best plums.

I will just mention three seedlings here that grow in my county. Our worthy secretary judged some plums at the State Fair. He asked me whose plums those were. I said they were Mrs. Clayton's. One was a little yellow plum of the highest quality, but not a market

plum. It does rot if not properly sprayed. It is an over-bearer, and is called the Quality. That is, we call it the Quality. It is one of our seedlings. Then I have a damson tree that grew from the seed that is of a drooping character, and bears in ropes. It is sweeter than the ordinary damson and brings a high market price. I also have a very large, fine blue plum. It has a heavy bloom on it. It is not quite as large as the German Prune, and of very fine quality. I have never found it profitable to grow any of the Japanese plums. I have ceased planting them. The Grand Duke is another splendid plum. It resembles Pond's Seedling.

Now I hope that the people who are here will go home and urge upon their neighbors to plant just a few plum trees for home use.

Most of our plum trees are not self-pollinating, and should be mated for best success. For the best results I would mix the trees or plant them close together, using different varieties. I suggest that you plant a few of the blue plums. I am exceedingly anxious that every farmer should have plums and other varieties of fruit on the farm.

We have a canning establishment at home. We regard the plum above other fruits for canning purposes. And what is better than a plum pudding? And they are fine for dessert. They can be made up into preserves, jellies and pies. The plum just needs care in planting and in selecting your varieties, pruning and spraying, and that is all there is to the proposition.

Remarks by Prof. Carmody.

One of the best commercial plums today is the Lombard. But it has this objection. The Lombard comes on the market a little before people are ready to can. The Monarch is now filling the bill perfectly. It is much better looking. It hangs to the tree much better and will be a good seller. In the commercial districts, the only one they want is a blue plum.

Questions asked Mr. Clayton.

Q. When do you spray for curculio?

A. I spray when the green just begins to show in the orchard. I use 4 lbs. of arsenate of lead paste to show in the orchard. But 3 lbs. will do equally well. I spray a second time when the blossoms have fallen. Then I spray again in about six to eight days and again in about a week, and then, I suppose, about twice more when I spray apples.

Q. Have you had any trouble with black knot?

A. My neighbors have had some trouble, but I cut it out when I see it.

MOSES F. JOHNSON, AN APPRECIATION

H. F. Hillenmeyer.

The sad duty of offering a brief memoir of the late Moses F. Johnson, long president of this association, has been assigned to me. May it be said first, that continuing and severe illness has made it impossible to search for personal scattered records, or examine fuller ones not in my possession. I thus detail personal reminiscences rather than offer an historic narrative.

I first became acquainted with Mr. Johnson as Superintendent of the fruit exhibit of the Louisville Southern Exposition in 1883. His name and fame had, however, extended over the state as President of the Fern Creek Fair Association of Jefferson County, a fair which was unique in that its exhibits consisted only of fruits, flowers and vegetables. In digression may it be said, that around this interesting hamlet of Fern Creek, and by Messrs. Johnson, Decker, Strong and Hawes—a former secretary of this society—was first demonstrated in Kentucky, the feasibility of the profitable cultivation of the improved blackberry right where the wild one was a pest in every worn or barren field, and to add further that here also and at the same time, kindred spirits were evolving the industry of the second crop potato.

Then he is recalled as a judge of fruits at fairs, near and wide, or as manager of such exhibits. At the St. Louis World's Exposition he staged and managed our state's offering with honor to himself and to it. During the earlier years of the State Fair he officiated in the same capacity. Then other trusts came to him, and he was unable to yield further service in that line, and declined the further presidency of this body.

When Col. Ion B. Nall became State Commissioner of Agriculture, appreciating Mr. Johnson's wide, accurate and up-to-date knowledge of the theoretical and practical phases of all the questions and problems involved, he was offered and accepted the position of State Institute lecturer. It was in this field that he became so widely known in every part of the state and perhaps accomplished his greatest work.

Mr. Johnson was not an ornate speaker. He was one of those rare men who can stand before an audience, and in language simple as that of a child, discuss a practical or technical question so connectedly, so logically, and convincingly that any hearer of the gospel of fruits, of trees, of flowers, of the necessities and amenities that could and should surround every country home, heard it indeed in his own tongue.

These are the salient features of Mr. Johnson's public career. But he was a many sided man. His courtesy in every contact with his equals, subordinates, associates and all, was faultless. He was

loyal to every friendship and knew not enmity. He was prompt to every appointment, and there was never doubt as to his position on any question. He was open as the day, without guile and absolutely frank.

Mr. Johnson held the highest office within the gift of this association longer than any predecessor. Let it be recalled also, that when he absolutely declined re-election, he was elected President Emeritus without a dissenting vote. He thus died within the full communion of its membership. All of him that was mortal has been returned to the peaceful bosom of the mother that gave him material being. His gentle spirit has winged its silent way to that mysterious power that we can neither fathom nor understand. But yet he is not dead, because the deeds wrought by good men for the endless uplift of humanity are equally crowned with its own immortality. Forever will the future be rendered better by the efforts of his fruitful life. And thus let there be discharged our loving duty of enshrining another memorial in the sacred Valhalla of our worthy and honored dead.

THE POTATO GROWING INDUSTRY OF JEFFERSON COUNTY

F. E. Merriman, Louisville, Ky.

Perhaps it would be interesting to know just where Kentucky stands as a potato producing state. Now, New York stands first, with an acreage of 400,000 acres, and Michigan comes next with a little over 300,000 acres, and Kentucky stands forty-first.

Jefferson County does not claim to be a first crop section, although we have a large acreage in first crop, but more attention is paid to the second crop. Our state stands first in second crop production. I am going to speak mostly of the second crop industry. The first crop industry has been well gone over and many bulletins published upon it, by the various states. The second crop is Jefferson County's own industry. It is a unique industry, and was born in 1882 near Louisville. John Pierce was the originator. At first there was only a small acreage but it gradually developed until last year we had almost 11,000 acres of potatoes devoted to the second crop. It was in February of last year that there were some 43,000 or 44,000 barrels of potatoes in cold storage. The average yield per acre was 60 barrels. Altogether we had 690,000 barrels, which, at an average price of \$1.75, makes over a million dollars. Nearly \$100,000 of this was paid out for labor, picking and harvesting the crop.

The second crop is planted between the middle of July and the first of August, and one good point about the second crop is that it does not sprout very much. We can hold them in cold storage and plant them, gathering about the first of October, and after putting them in cold storage, they do not sprout. They have a flavor that no

other potato can compare with. They also have a tendency to develop only one or two sprouts.

One of the little industries coming out of this second crop is raising seed for the northern growers. A great many of the second crop potatoes are shipped to Delaware and New Jersey, where they will develop and mature early.

We have two co-operative associations, one of them being one of the strongest co-operative societies in the United States. At St. Matthews we have a strong association of about 200 members. They have a cold storage plant. This association will ship, from one year to another, about a thousand acres of potatoes. We have another association at Buechel which handles about 400 or 500 acres a year. Last year our farmers were progressive enough to get Dr. W. M. Stuart, the potato expert of Washington, to come down and give them a talk about potatoes.

The varieties we use in Louisville are the Irish Cobbler for the first crop and Carman No. 3 for the second crop. Now, if we used the Carman No. 3 for the first crop, they would not come on fast enough, and the Irish Cobbler do not do so well as a second crop. We have the Early Triumph, but the white potato is what we want, weighing from four to seven ounces. We have several types of Irish Cobblers. We are planning to do some work in identifying varieties this spring.

The Irish Cobbler seed for the first crop is raised in the fall of the year before we need them. They are planted about the middle of July and harvested about the middle of October or first of November. They are then put into cellars and kept till April or the last of March, according to the season, when they are taken out and planted. Enough Irish Cobblers are saved and placed in cold storage in February to be planted in July to grow during the fall for the seed of the following year. The Carman for the second crop are planted in July and the crop is put into storage or sold. Enough of the potatoes are saved for seed and put into cold storage in February and held over till July and then planted. Sometimes a man who knows how to raise potatoes in other sections, will go there, and make a failure of it simply because he will not choose the right varieties.

As to seed, that is an open question. I think it is generally recognized that a seed potato should be between six and nine ounces and it should be quartered, making about a two ounce piece. But in Jefferson County we save our little potatoes, and the consequence is, potatoes run out down there. We are going to experiment along this line, this year, and we are going to show the farmers that it is profitable to save and plant the best seed and not plant the small, poor potatoes.

As to cultivation, there seems to be a variety of opinions. So

far as I can find out by observation, the general practice is to cut the seed potatoes rather too small, and then plant them by machinery. We have two types of planters. The potatoes are planted two or three inches deep with a planter, and the disk covers throw the dirt up in large ridges. The seed is dropped about 14 inches apart in the drill and the rows are two to three feet apart, perhaps 30 inches. Then about two or three days after the potatoes are planted, the ridges are rolled; some harrow and some roll. Then when the potatoes show up green, they are cultivated with a two horse cultivator. They are cultivated three or four times and then they are laid by on a ridge. I find there is a difference of opinion as to the best method of laying by potatoes. We have an idea that ridging them is best. Others say level cultivation is best. One of our growers, who raises more potatoes to the acre than any other man, uses level cultivation. The second crop needs very little attention after they are laid by.

Sometimes the potato beetles get bad, but the second crop potatoes do not need much spraying. The first crop needs Paris Green in large quantities. This is another question we shall experiment upon—whether dust or liquid sprays are best. In Jefferson County we have been using dust machines altogether.

The first crop potatoes, in order to get them on the market early and get a high price, are not allowed to ripen. Sometimes in the fall, also, they do not ripen them, and some growers have an idea that the immature seed gives the best results. This is another question we shall try out with experiments.

They use large quantities of fertilizers in Jefferson County; from 600 to 1,000 pounds of the 3-8-6 composition, per acre. We shall experiment to find whether the potatoes need potash or not.

As to the type of land. It is a common idea that potatoes can only be grown on a sandy loam. I believed that until I went to Jefferson County. We have three types of soil there. We have the crawfish or white soil and have gotten good crops from this type of land. We have the rich soil around St. Matthews and Buechel, which gives splendid results. Then we have some poor land around Louisville, which has also given good crops. I believe Kentucky should be a better potato raising state than it is. Kentucky should be a fruit produce state. We have the markets on all sides. Our main crop is always shipped.

Now, as to diseases: I do not believe we need to deal very much with diseases because in Jefferson County we do not have any serious diseases that I have been able to discover. We have scab which is found everywhere, and is one of the easiest diseases to control and to prevent by the use of a pound of formaldehyde in thirty gallons of water, soaking the seed for two hours. Some of the growers using suitable apparatus, can soak 100 bushels in a day.

One thing we are fighting against is northern seed. We got some good seed from the Wisconsin Experiment Station last year, but in the main the northern seed is diseased.

I might mention what we are doing with potato breeding. Potatoes are not looked upon as worth breeding, but we are going to take up the matter of breeding potatoes, and I believe it is possible by selection of seed, to eliminate the unproductive tubers so that we can raise, instead of 160 bushels as we do now, an average of 400 to 500 bushels per acre.

Any farmer who raises potatoes and does not want to save his best seed, does not want to progress.

There is another method, by selection of hills. I have prevailed upon several of the farmers to set aside a plot and dig them up with a fork and save each good hill and then go through with a basket and drop in the best potatoes from the hills. If they will do that, the farmers can produce 600 bushels to the acre.

Q. What time do you plant your first crop?

A. Between the last of March and first of April, depending upon the season.

Q. What was your best yield?

A. Our best record with the boys was at the rate of 276 bushels to the acre at a cost of 19c a bushel.

Q. What make of potato digger do you use?

A. The Champion is one of the best. It sells for about \$75 and will last for three years. I am going to try to introduce the Hoover machine which lasts a lifetime. It is heavier than the others. It requires four big mules to run it.

Remark by Mr. Merriman.

The boy who won the prize this year in the potato club was the boy who won it last year, showing what selection will do. He has been selecting seed for several years. No boy in the county can overtake that boy. He raised 276 bushels and his brother was second with only 50 or 60 bushels less, and he also selects his seed.

THE FRUIT CROP OF 1914. EXPERIENCE OF HENDERSON COUNTY.

Paul D. Brown, Henderson County.

The beginning of the increasing fruit industry in Henderson County sounds like a fairy tale. About nineteen years ago, a Canadian minister came down to that county in hopes of regaining his health. He looked about to find a farm where he could settle. He finally located a farm on which was a small orchard of about twenty acres. His neighbors, after he had bought the farm, advised him to cut down the trees and raise tobacco. He began to use a

sharp axe on a great many of the trees, but he finally decided to leave them, and the result is that today Henderson County is one of the biggest fruit growing counties in Kentucky.

I believe that its reputation is due largely to the efforts of that one man. He has had a great influence over the fruit growing industry of the whole county. That man is the Rev. E. McCollom; He still produces a good quality of fruit, and is still a good fruit man, as he always was. This fall, the County Agricultural Agent undertook to take a fruit census of Henderson County, getting the numbers, ages, and varieties of trees. Of course this is slow work. You have to get out and visit the growers personally to get the statistics from them. So far I have only received 35 responses out of 110 requests to cards that we sent out, but we hope to have the complete list by spring. The best estimate we can make now on the number of trees is 100,000.

The varieties are good. We have practically all the apples that will grow in Kentucky, but the chief variety in Henderson County is the Winesap. The Winesap tree there grows to perfection. This year, practically the entire crop of apples in Henderson County was Winesap. There were about 10,000 barrels produced, about 8,000 of which are now in cold storage. We also grow Stayman, Delicious, Black Ben, Mammoth Black Twig, Rome, and some few others, but not in great quantities. The Winesap is the most productive. We are getting away from the Ben Davis. Practically all the new orchards are Winesap. Another variety that seems to be gaining popularity is the Delicious apple. There are only four bearing Delicious trees in Henderson County, and so far as I can see, the man who grows them is not very well satisfied with them. I do not mean to condemn the apple for it is one of the best, but so far as productiveness and profitableness are concerned it has not been fully successful in that county. The Mammoth Black Twig is quite popular, and many new orchards are being put out in that variety. The Ben Davis of course bears very well, but they are having a little trouble marketing the apple. The buyers take the Winesap and other varieties in preference to the Ben Davis, and the grower finds it a problem to get rid of his Ben Davis.

There is a variety of soils in Henderson County. Most of the orchards lie in the coal fields, with red clay soil, and seem to produce the best fruit. We have some Ohio river bottom land in the county and I know of several orchards in that kind of soil that are producing good apples profitably.

As to orchard management, practically every man has his own method of management. Cover crops are largely used, mostly crimson clover. In the red clay soils, where they are rather depleted, they use cowpeas and soy beans in the summer, and crimson clover in the winter, to bring up the fertility of the soil and they give good

results. They do little summer cultivation in the orchards. They plow in the spring and plant some kind of crop.

We have very good facilities for handling the crop. There are two cold storage plants, with capacity of 20,000 to 30,000 barrels of apples. The rates for storage are 50c for the six months, and in very few instances are the apples sold at picking time. They are kept in cold storage till January, February and March.

We badly need some sort of strong organization among the fruit growers. I mean a local organization. We have a state organization, but I believe we ought to have a county organization. Our local Fruit Growers' Association has done good, but they have many more things to do. A good many of the growers want to get into packing and marketing co-operatively, standardizing the pack and marking the boxes. They want to use box packing, as there is a box factory right in the town, and we can persuade them to make apple boxes and sell them to the fruit producers at a reasonable price, I believe.

I do not suppose there is a place in Kentucky, where apples are grown, that is not over-run with pests. Our chief pest in Henderson County is the San Jose scale, but we are getting the best results possible from spraying. Some use power sprayers and some hand pumps, both of which give good results. Some of the largest orchards have two power sprayers working at the same time to combat the codling moth, as the spraying must be done as quickly as possible while there is time.

There are a great many Stayman Winesap apples in Henderson County that are in bearing now, and the results have not been very good with that variety. The crops are good but the apples seem to crack very badly, which gives a great many culls. Whether the soil causes this we do not know. Some experiments are being tried out on the county poor farm which will show some results in years to come that will be of benefit to the whole state.

The apple industry is growing in our county and we believe we shall become one of the greatest fruit producing counties in the state when tobacco planting is replaced by orcharding.

Q. What is the price that the growers expect to get for their Winesaps?

A. I can hardly say. Year before last, at the time they stored the apples, they got \$4.50 a barrel. Some men sold their apples as high as \$8.00, after being stored till February. This year I think they will bring \$6.00.

Q. Does the Stayman Winesap give trouble cracking in all sorts of soils?

A. There is only one orchard where they do not crack. It is on the roughest land in that county. The elevation is 100 to 150 feet. It never has been cultivated, only pruned and sprayed.

Q. Why is it you have not mentioned the Grimes Golden? When

I was down in Henderson with you, you showed me some thrifty Grimes Golden trees.

A. One reason is that they have not done well this year. While they bloomed well, still the blight struck them harder than any other variety. The Winesap did not suffer much from blight.

Q. Have you had trouble with the Stayman Winesap cracking other years?

A. Yes, we have had it all along.

Remark by Mr. O. B. Burrell.

The Grimes Golden in Daviess County seem to be the most tender of all the varieties. One of our growers lost nearly all his trees by mice. One of the other growers lost a great many with trunk blight. We have practically no good Grimes Golden trees.

HOME-MADE LIME SULPHUR VERSUS THE COMMERCIAL SPRAY.

W. B. Lanham, Horticulturist, Columbia, Missouri.

Several times you may have noticed articles in the agricultural papers against the use of home manufactured lime sulphur spray. These are usually written by manufacturers of commercial spray, and convey the idea that good results cannot be obtained with the home manufactured product.

I have had experience both in Washington and Montana with the home-made as well as the commercial spray, and when properly made, I have had as good results with the home-made as with the commercial product.

We had the proposition to contend with at Clarkston, Washington. The growers felt that they were paying too much for commercial lime sulphur and getting too little in the way of results. We were paying from \$11 to \$12 per barrel for spray that tested 30 to 32 degrees Beaume. The matter of relief was before our local horticultural society several times and was discussed pro and con. Finally it was settled by one of the growers agreeing to make spray and sell it to the others at a profit of \$1 per barrel above the actual cost of production.

I shall not attempt to take up the technique of lime sulphur manufacture, for there are a number of good bulletins describing the home manufacture of this solution. They are for free distribution, and if there has not been one published by this station I am sure the director can assist you in securing a copy. Instead I shall briefly describe one of the plants I have seen used to manufacture this solution.

At Clarkston they have a co-operative fruit and vegetable cannery. This boiler was used to cook the spray, so about the only expense of equipment was a couple of vats and some pipe connections.

The boiling vat, large enough to hold ten barrels, was placed four feet above the ground in a shed at the side of the cannery. It was made of 2 in. x 12 in. boards, held together with iron rods, and had a close-fitting top.

The settling tank of the same size and made of the same material was placed on the ground with the top about three inches lower than the bottom of the boiling vat. A gate valve allowed the spray to run into the settling tank as soon as cooked. This settling tank was on a hillside, steep enough that while the upper end rested on the ground just below the boiling tank, the lower end was high enough to siphon the spray into barrels.

In the boiling tank, about six inches from the sides and the same distance from the bottom, was placed a one-inch steam pipe. This extended completely around the inside of the vat and connected with the boiler. Every six inches one-eighth inch holes were drilled in the pipe. The force of the steam through these holes rotated the mixture so thoroughly that no other agitation was necessary.

The formula used was 100 pounds of lime, 200 pounds of sulphur and enough water to make 100 gallons of spray. Only the best grade of lime and flowers of sulphur were used. The lime was slacked in a box just above the boiling tank, and while slacking, as much sulphur added as it would dissolve. The rest of the sulphur was made into a thin paste so there would be no lumps, and the whole flushed into the vat. Then enough water was added to make the required amount of mixture. The time of cooking was reckoned from the time the mixture actually began to boil. If a full head of steam was turned on it could be cooked in thirty minutes, but a better spray was obtained by boiling at a lower temperature for an hour.

Sulphur costs \$2.25 per 100 pounds and lime \$1.80 per barrel of 200 pounds. The spray tested 25 to 28 degrees Beaume and was furnished to the growers at \$4.75 to \$5.50 per barrel, depending on the test. The price was based, as it should be, on the strength of the solution.

No doubt the manufacturer of commercial spray will tell us it cannot be put out for that price. That may be, but the manager told me he had had a successful season and I know the plant was operated on the same plan the next year. I was also informed by

some of the orchardists, as well as the county fruit inspector, that they had better success with this than with the commercial product. However, I don't think it was because the spray was better, but, as it was cheaper, it was applied stronger. I am not attempting to say that the home-made spray is better than the commercial, but I am contending that it is as **good and very much cheaper.**

It may be that the grower with only five or six acres cannot afford to equip a plant with a steam cooker. He can, however, cook his spray in an open vat. And while it will cost him more and he will not get so large a proportion of his materials in solution, yet it will probably be cheaper than to pay the prices the commercial manufacturers are asking us. The ideal way, of course, would be for each community to co-operate and have one person to make for them all.

A few years ago I took charge of an orchard project in the Bitter Root Valley, Montana. There were about ten acres of apples in one old orchard that had never been sprayed. This was planted as a family orchard and was a mixture of varieties. I was told very little of the fruit was marketable the year before, because of apple scab and oyster shell scale.

I at once began asking for prices on lime sulphur solution and found the best I could do was \$12 per barrel for the commercial. I was seriously contemplating making my own when I received a quotation from a couple of young fellows in Missoula, of \$6.25 per barrel. They had previously had no experience at this work but were putting out a good looking product that tested 25 to 26 degrees Beaume. Of course this could not be diluted the same as the more concentrated commercial spray, but at the difference in price I could afford to use more spray and less water. We always test each barrel with a hydrometer before using. And while we use a dilution table as a guide, each tank of spray is tested to see that no mistake has been made. We lay greatest stress on the test of the diluted spray.

This orchard was sprayed the first time just as the buds began to swell. This mixture tested 4-4½ degrees after dilution. Our second spray was applied as the buds began to show pink. The diluted spray tested two degrees. As soon as the petals had fallen, the third and last spray testing 11½ degrees, was applied.

We used a gasoline spray outfit and maintained a pressure of 250 pounds with three lines of hose and six Bordeaux or Bean nozzles. Two men worked on the ground and the driver sprayed the high branches from the top of the tank. I attribute some of the results to the high pressure used and to the thoroughness of the

work. As Professor Beatty, of Washington State College, says, "You only kill what you hit." I might add, "And then only when you hit it hard enough." We never expect the best results with less than 200 pounds pressure.

None of the fruit or foliage was scorched, neither were the pump valves ground out by the mixture as some would have you think home-made lime sulphur will do. Also at harvesting time I think we found not over a dozen scabby apples and these were McIntosh Reds, a variety very susceptible to scab, and none were condemned for scale. If anyone did better with high priced commercial spray I would like to hear from him.

I believe, when properly diluted, the low testing home-made sprays are as good as the more concentrated commercial ones. At least they gave as good results. Of course they are not worth so much per barrel, but at the price I paid in Montana and especially at the price the growers were furnished at Clarkston, there was a considerable saving.

Take, for instance, what it cost me in Missoula. The commercial spray testing 32 degrees cost \$12 per barrel. This would make $8\frac{1}{2}$ barrels of diluted spray testing four degrees, at a cost of \$1.41 per barrel. The home-made spray, testing 25 degrees, cost \$6.25 per barrel and would make six barrels diluted to the same strength, at a cost of \$1.04, or a saving of 37 cents on every barrel diluted for use. Practically \$1.50 saved on each 200 gallon tank of spray used. This in a season would make quite a neat little sum. And I for one would rather keep that money than give it to the manufacturer of spray.

OBSERVATIONS ON COMMERCIAL PEACH GROWING IN KENTUCKY.

J. H. Carmody, Lexington, Ky.

The peach industry in our state has been attracting considerable attention recently because of the facts, first: That there have been no serious frost injuries in the past two seasons; because of the liberal profits made by some of the peach growers, and because, also, of the quick returns derived from young orchards of this fruit.

The conditions necessary for successful peach growing in Kentucky resemble, of course, the conditions required in other fruit districts. Many of the great peach growing sections are located

upon the leeward side of large bodies of water. This is noted in the Michigan peach district, in the northern Ohio and western New York regions, and in the Chesapeake peninsula. It is natural to look for some similar conditions, therefore, in our own state, and we find, upon examination, that the peach growing territory is confined, largely, to counties along the Ohio river such as Trimble, Jefferson, Bullitt, Henderson, McCracken. Other counties which are producing peaches are Warren, Pulaski, and Rowan, all of which are in close proximity to rivers.

Peaches offer quicker returns than most other fruits, but a man must meet certain requirements. First, he must understand that the peach is more of a speculative crop than most other fruits, and he must be willing, therefore, to take chances. Second, he must understand that a peach crop requires a great deal of close personal attention. Third, apple orchards may be left uncultivated, but peaches should never be thus neglected. Fourth, you must have a love for the business and be prepared to give it your personal supervision.

The natural conditions for peach growing in Kentucky are of the very best. In numerous places scattered over the state, can be found sites, soils, good transportation facilities by rail or by water, nearness to markets, and other favorable conditions. The matter of temperatures and frost injury are the only questionable points in our state.

It is true that there have been many failures in Kentucky peach growing enterprises, but these failures resulted usually from easily assigned causes. Many peach orchards have been allowed to care for themselves and have been given little if any cultivation. Frequently there has been too little pruning done, which has resulted in a diminished bearing surface, in a scanty growth of the trees, and in the over-running of the trees with scale and other insects. Furthermore, the trees have frequently not been properly supplied with plant food.

According to the New York Experiment Station, an acre of peaches removes 75 lbs. of nitrogen, 18 lbs. of phosphoric acid, and 72 lbs. of potash, while a wheat crop of 20 bushels, with the $1\frac{1}{2}$ tons of straw removed with the crop, takes from the soil only 42 lbs. of nitrogen, 14 lbs. of phosphoric acid and 20 lbs. of potash.

The matter of cover crops for the peach orchards in winter has often been neglected, with resulting loss. Among the sections of Kentucky advantageously situated for the production of peaches, may be mentioned, first, Pulaski and parts of adjacent counties. This whole region offers splendid opportunities. It con-

sists largely of rough mountain land, and the trees already planted are, for the most part, poorly cared for and given little pruning, no cultivation or spraying. One orchard in this section, of $2\frac{1}{2}$ acres area, has returned over \$600.00 recently, the fruit being marketed in Danville. In the eastern section of the state may be mentioned the very successful young orchard of Dr. H. Van Antwerp, in Rowan County, one of the best in eastern Kentucky. Here, the trees are properly headed and pruned, the methods of cultivation are very good, and the details of packing, etc., are carefully attended to.

In Bullitt County, the orchard of Judge Funk constitutes one of the best in the state, the yield this year being between 15,000 or 20,000 bushels, chiefly of Elbertas and Henriettas. Much of the crop was sold, this year, for \$1.60 per bushel, being disposed of chiefly in Pittsburgh and New Orleans. The land in this region is hilly and somewhat sandy, and offers exceptional opportunities for peach growing.

The industry has also received a strong impetus recently around Bowling Green, resulting in part, no doubt, from the excellent work done in the strawberry growing industry through the organization of a fruit growers' association. 1,000 acres of peaches have been planted during the past fall, and in 1914 prices were \$1.60 per bushel for the first grade, and \$1.35 per bushel for the second grade, the Elberta being the leading variety.

In Henderson County, the orchard of Mr. McCollom was particularly noted as producing exceptionally healthy trees, being well cultivated and properly fertilized. In this section (Henderson County), only 50c a bushel could be realized for the fruit at the time of ripening, and some of the growers consequently stored their fruit for three weeks when they were able to secure \$1.50 per bushel. The fruit, after this period of storage, was still sound but it had to be sold because it was beginning to lose flavor.

Many varieties of peaches are grown in the state, the white peach predominating in many sections, probably due to the idea that it is more resistant to frost. Among the varieties especially suited to commercial orchards in our state may be named, as of special prominence, Carman, Belle of Georgia, Elberta and Henrietta. With this list of varieties there is plenty of time to clean up each kind before the succeeding variety comes on.

Judging from the conditions observed throughout the state, Kentucky offers splendid opportunities in commercial peach growing provided the growers will observe these fundamental requirements. The owners must spray; they must cultivate well, and fer-

tilize; the trees must be well pruned, and care must be taken in marketing fruit of standard grades.

Q. Have you seen any difference in the northern stock and southern?

A. I have not seen much difference. I have taken southern grown stock north and they are making just as good growth as the northern.

Q. Will the northern stock bear sooner?

A. No, they will not.

Q. What should be done for leaf curl?

A. Spray in February or March with lime sulphur or Bordeaux mixture. Scalecide has not been very successful in controlling leaf curl.

Q. How about feeding the trees?

A. Plow the ground thoroughly. Plant corn for three years in the orchard, after the trees are planted. Put on nitrate of soda when the trees are beginning to bloom or just before. Another good thing is wood ashes.

Q. Do you advise planting peach trees with apples?

A. I would not recommend it as a rule. The 5th, 6th and 7th years are the profitable years for a peach orchard, and at that time the apple trees would be making all the demands on the soil. A peach orchard is good for ten or twelve years.

Q. What do you use to protect the trees from rabbits?

A. Wire is a good thing.

Q. What about the borer?

A. In getting rid of borers, a knife and a wire must be used. The time to go after the borer is along in May or June. Hot water is no good for borers. Asphalt and other protectors are no use. The Borowax does not help much either.

Remarks by Prof. G. D. Smith.

“About rabbits bothering the trees—for several years past I have used lime and crude oil mixed until it makes a thick paste, and applied this to the tree with a brush. I have used this for two years on five thousand trees and I find that the rabbits leave them absolutely alone. The price of this mixture is 4 or 5 cents a gallon.”

Concluding Business.

Following the conclusion of the regular program, the reports of committees were called for, and report of the committee appointed to audit the treasurer's report, stated through the chair-

man, Mr. John T. Milligan, that the committee had examined the treasurer's report and had found it correct. On motion of Mr. W. H. Clayton, seconded by G. D. Smith, it was ordered that the report of the committee be adopted.

It was ordered upon motion of Mr. W. H. Clayton, duly seconded, that until further action be taken, the annual meetings of the Kentucky State Horticultural Society be held in Lexington during Farmers' Week.

On motion of Dr. H. Van Antwerp, seconded by G. D. Smith, the following resolution was adopted:

"Resolved: That the Kentucky State Horticultural Society desires hereby to express its grateful appreciation to Hon. J. W. Newman, Commissioner of Agriculture, and to the State Board of Agriculture, for their courtesy and co-operation in publishing the annual reports of this organization, and in placing at our disposal a liberal number of copies for distribution to members and others."

On motion of Mr. W. H. Clayton, it was ordered that the secretary be directed to continue the arrangement with the "Inland Farmer," of Louisville, Ky., whereby this paper shall serve as the organ of the society.

The society then proceeded to the election of officers for the ensuing year. Dr. Fred Mutchler was nominated for the office of president, the nomination was duly seconded, and there being no second nomination, Dr. Mutchler was duly elected. Nomination of district vice-presidents was then entered upon. The names of M. F. Johnson, of Louisville, being removed from the list by his death, and the name of John E. Nichol being dropped on account of his removal from Warren County, all the other vice-presidents of the preceding year were re-elected, and the following additional vice-presidents were, upon nomination, duly seconded, chosen to fill the vacancies in Jefferson and Warren counties, and additional vice-presidents were elected from Hardin County, Rowan County, Rockcastle County, the list for the ensuing year then standing as follows: W. H. Clayton, Hebron, Boone Co.; Louis E. Hillenmeyer, Lexington, Fayette Co.; John T. Milligan, Stithton, Hardin Co.; C. E. Sugg, Henderson, Henderson Co.; F. E. Merriman, Louisville, Jefferson Co.; Jay H. Northup, Louisa, Lawrence Co.; Fred R. Blackburn, Stanton, Powell Co.; G. D. Smith, Conway, Rockcastle Co.; H. Van Antwerp, Farmers, Rowan Co.; John H. Richardson, Bedford, Trimble Co.; Morgan Hughes, Bowling Green, Warren Co.; and Mrs. J. M. Garrett, Ft. Garrett, Woodford Co.

No further business being proposed, the meeting, upon motion, adjourned.

Supplementing the program, there was an excellent display of fruits and nursery stock voluntarily brought together without any stimulus of valuable premiums. Besides a beautiful display of Henderson County fruit, many local growers showed specimens of standard Kentucky varieties of apples, and Stark Brothers of Missouri exhibited handsome boxes of the varieties of which they make a specialty, particularly the Delicious and Stayman.

W. P. Stark & Co., and several Kentucky nurserymen made attractive and instructive exhibits of nursery stock, especially fine displays being made by Donaldson & Co., of Sparta; H. F. Hillenmeyer & Sons, of Lexington, and W. A. Sandefur, of Henderson County.

Considerable interest was shown in an assemblage of named varieties of pecans contributed by Mr. J. F. Wilkinson, of Rockport, Indiana, some of these nut varieties having originated upon the Kentucky side of the Ohio river, and others in southern Indiana.

REPORT OF TREASURER KENTUCKY STATE HORTICULTURAL SOCIETY, JANUARY 6, 1915.

RECEIPTS.

Jan. 7, 1914—Balance on hand, as reported.....	\$ 7.80	
44 membership fees received to date..	44.00	
Sale of surplus fruit at exhibition in January, 1914	15.62	
		————— \$67.42

DISBURSEMENTS.

Jan. & Feb., 1914—23 subscriptions to the Inland Farmer, the society organ.....	\$ 5.75	
March, 1914—14 subscriptions to the Inland Farmer..	3.50	
March 9, 1914—50 2-cent stamps.....	1.00	
April, 1914—3 subscriptions to Inland Farmer.....	.75	
April 8, 1914—State University Press, 1,000 letter heads	3.50	
1,000 subscription blanks.....	3.00	
December 30, 1914—500 one-cent stamps for mailing programs	5.00	
January 5, 1915—University Press, printing 1,500 4-page programs	10.75	
1,000 envelopes for same.....	3.25	
		————— \$36.50
January 6, 1915—Balance on hand.....		\$30.92

Approved:

J. T. MILLIGAN, Chairman,
W. W. HILLENMEYER,
W. H. CLAYTON,
Auditing Committee.

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