1892

Results of 1891 obtained on the North Louisiana Experiment Station, Calhoun, La.

Jordan G. Lee

SECOND SERIES.

No. 16.

BULLETIN

OF THE

AGRICULTURAL EXPERIMENT STATION

OF THE

LOUISIANA STATE UNIVERSITY AND A. AND M. COLLEGE,

AT

BATON ROUGE, LA.,

FOR 1891.

WM. C. STUBBS, PH. D., Director.

RESULTS OF 1891

OBTAINED ON THE

NORTH LOUISIANA EXPERIMENT STATION,

CALHOUN, LA.

J. G. LEE, B. S., Assistant Director.

BATON ROUGE, LA.
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LOUISIANA STATE UNIVERSITY AND A. & M. COLLEGE.

BUREAU OF AGRICULTURE.

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The Bulletins and Reports will be sent free of charge to all farmers, by applying to Capt. T. S. Adams, Commissioner of Agriculture, Baton Rouge, La.

NORTH LOUISIANA EXPERIMENT STATION,
CALHOUN, LA., January, 1892.

To Dr. W. C. Stubbs, Director Louisiana Experiment Station, Calhoun, La.:

DEAR SIR—I transmit to you herewith the annual report of this Station, covering all operations performed and all results obtained for the year. I trust its publication may be productive of good to the general cause of agriculture, and especially to the small farmers of North Louisiana.

Respectfully submitted,

JORDAN G. LEE, B. S.,
Assistant Director.

LOUISIANA STATE UNIVERSITY & A. & M. COLLEGE,
STATE EXPERIMENT STATION,
Baton Rouge, La., January, 1892.

Capt. T. S. Adams, Commissioner of Agriculture, Baton Rouge, La.:

DEAR SIR—I hand you herewith report of Maj. J. G. Lee, Assistant Director, of Experiments conducted during the past year on the North Louisiana Experiment Station at Calhoun, La., and ask that it be published as Bulletin No. 16, Second Series.

Respectfully submitted,

WM. C. STUBBS,
Director.

REPORT.

REVIEW OF THE YEAR.

The weather during the early part of the year was favorable to farm work and plant growth. In April, a drought of unprecedented length and severity began, lasting till July. This drought was very detrimental to the garden and field crops. The winter grasses and grains, the early vegetables and the corn, sugar cane and forage crops were materially injured. Cotton alone seemed capable of resisting its deleterious influences.

THE ORCHARD.

Two hundred and thirty-five varieties of fruits have been added to those given in Bulletin No. 8, Second Series, as constituting the orchard of 1890.

The following are the added varieties—two trees of each:

Peaches (27 varieties)—Freestones: Alexander, Albert Sydney Johnson, Berenice, Baldwin's Late, Foster, Great Eastern, Globe, Lady Ingold, Muir, Muscogee, Oriole, Red Ceylon, Sallie Worrill, Wheatland, Wonderful. Clings: Annie Wylie, Burke, Chinese Cling, Croft's Golden, Duff's Yellow, Eaton's Golden, Goode's October, General Taylor, Heath's Red, Shelby, Tuskena, White July.

Apples (31 varieties)—Summer: Red June, Yellow Transparent, Hominy, Gravenstein, Sweet Bough, Family, May Pippin, Nantahalee, Kansas Queen, Oldenburg, Washington Strawberry, Julian. Fall: Bowen, Lauren's Greening, Equinetelee, Taunton, Mrs. Bryan, Grimes' Golden, Rawl's Jennet, Shannon.

Winter: Pryor's Red, Horn, Red Limbertwig, Royal Limbertwig, Cullasaga, Stevenson's, Nickajack, Waugh's Crab, Yates, Hewes' Virginia Crab.

Pears (8 varieties)—Beurre Dill, Lawrence, Reliance, Flemish Beauty, Madeline, Dr. Jules Guyot, Postiezen, Doyenne Sieulle.

Plums (14 varieties)—Japanese: Botan, Sweet Botan, Burbank No. 1, Burbank No. 2, Botankio, Hattonkin, Long Fruited, Masu, Ogon, Red Nagate, Satsuma, Ura Beni, Yosobe. English: Imperial Gage.

Cherries (22 varieties)—Elton, Kirkland's Mammoth, Gov. Wood, Rockport Begardeau, Cleveland Begardeau, Noir de Schmidt, Early Lamourie, Leulling, Coe's Transparent, Werder's Early Black, American Amber, Buttner's Yellow, Black Tartarian, Royal Duke, May Duke, Empress Eugenie, Montmorency Ordinaire, Belle de Choisy, Belle et Magnifique, Belle de Montreuil, Early Richmond, Olivet.

Japan Persimmon (1 variety)—Masu-Gata.

Grapes (52 varieties)—Ives, Moyer, Delaware, Eaton's, Early Victor, Bacchus, Humbolt, Gardner's, Allen, Triumph, Welcome, Black Defiance, Vergennese, Irving, Noah, Clinton, Hermann, Warder, Jessica, Long, Pearl, Elvira, Empire State, Early Dawn, Mrs. McLure, Emily, Peter Wyley, Montefore, Poughkeepsie Red, Eldorado, Amber, Lenoir, New Haven, Perkin's, Catawba, Moore's Early, Warren, Uhland, Imperial Pizarro, Transparent, Conquerer, Excelsior, Canada, Rockwood, Creveling, Rogers No. 15, Agawam, Prentiss, Antoinette, Flowers, Thomas, Scuppernong.

Pecans—Fifty trees of Soft Shell.

English Walnuts—Twelve trees.

Mulberries—Seven trees.

The original orchard was prevented from bearing fruit by the late frost of April. It is hoped that the coming year will be be propitious and that fair samples of fruit from many hundred of trees will be obtained and critically examined. The fruit industry must become more prominent in North Louisiana, both

for home consumption and exportation, and the Station hopes to render valuable assistance by determining the merits and demerits of each new variety.

LIVE STOCK.

CATTLE.

The Holsteins and Jerseys, heretofore described, are doing well. The increase of each breed is taken by the farmers at the established prices. "Rubina," the Holstein cow, continues her record of 7 gallons of milk and 2 pounds of butter, while "Beautiful Princess," the Jersey cow, with a daily yield of only 4½ gallons milk, gives 2¼ pounds of butter.

GUERNSEYS AND DEVONS.

To the above have recently been added a pair each of Guernseys and Devons. The following are the pedigrees of the animals purchased:

Guernseys—Bull "Carolina Hero," No. 2496, calved May 8, 1889; sire, Sambo "112;" dam, Imported Daisy, "1747." Cow "Thornless," No. 5252, calved March 5, 1889; sire, Prince Champion "1473; dam, "Lilly of the Dale." The cow was received in poor condition, and with a young bull calf. She has rapidly improved and all attempts to test her milking and butter qualities must be deferred till her next calving.

Devons—Bull "Dan," No. 5107, calved April 20, 1890; sire, Duke of Oakland, "4675;" dam, "My Queen, 8207. Cow "Red Rose Fan," No. 8548, calved July 25, 1889; sire, Princess 2814; dam, "Fan Faultless," 4887.

From these four breeds of cattle, it is believed that North Louisiana can find one or more adapted to its wants.

SHEEP.

Southdown, Shropshire and Merino are the breeds of sheep now on hand. After a trial the Cotswold has been discarded as too large and unwieldy for this section of the State. Both the

Southdown and Shropshire have done well, combining mutton and wool qualities with hardiness, they are both both to be recommended for crossing on our native sheep. However, many excellent judges recommend the first cross to be made with the Merino, which are also hardy but small, in order to clothe the naked parts of our native sheep with wool, and after that to incorporate the Southdown or Shropshire stock.

To test these questions, two native ewes have been placed with each buck, and the "grade" lambs are now on trial beside the "pure breeds." A few grade bucks, ready for service, of the Shropshire and Southdown breeds, can be had at low figures. In a few years the grades of each breed will increase to such an extent as to furnish extensive and satisfactory tests as to their adaptability to the wants of our people.

HOGS.

Since our last report, the White Chester and the White Yorkshire have been discarded. Both are pronounced, after trial, greatly inferior to the retained breeds, at least in this section of the country. The Duroc or Red Jersey, the Berkshire and the Essex are retained. These three breeds are deservedly popular in North Louisiana, and each has its special patrons among the most observant farmers. There has been, however, more demand for the Red Jerseys than either of the others. The Berkshire and Essex seem to be in about equal favor. The Red Jerseys are great consumers with rapid growth and full development in flesh and fat for food consumed. They are hardy, good rustlers and very prolific, raising as high as three litters per annum. With an abundance of food they are rapid pork makers. They are, however, omniverous and will eat a chicken, lamb or kid whenever permitted. This is a serious objection to the small farmer and his good housewife. The Berkshires share with the Red Jerseys many of their excellent qualities. They are excellent foragers and when crossed on the natives give perhaps the best range hog in the world. They are healthy and prolific and furnish the finest "marbleized" hams. For a general stock hog they can hardly be surpassed. They too are inclined to be carniverous

and should not be brought into too intimate relations with young fowls, lambs and kids. The Essex is emphatically the lot hog. They are somewhat sluggish, hearty and always fat. They are slow and uncertain breeders. They are gentle, kind and indisposed to extensive foraging, They can easily be made to weigh 150 to 250 pounds when one year old, a size admirably adapted to the table wants of a small farmer.

Any one of the above breeds are to be recommended to the farmers of this State, but a careful survey of his environment should be made by each farmer before making a selection. The Station can furnish pigs of either breed in limited quantities.

POULTRY.

A record was kept of the eggs laid by the several breeds of hens from January to August 1891, with the following results:

RECORD OF EGGS LAID BY DIFFERENT BREEDS.

Breeds.	No. of hens on trial.	No. of eggs laid.	Average per hen.	Remarks.
Brown Leghorns	2	132	66	European origin.
Minorcas	1	44	44	European origin.
Houdans	1	29	29	European origin.
Silver Spangled Hamburgs	1	27	27	European origin.
Langshans	2	98	49	Asiatic origin.
Light Brahmas	2	36	18	Asiatic origin.
Partridge Cochins	2	48	24	Asiatic origin.
Buff Cochins	1	21	21	Asiatic origin.
Barred Plymouth Rocks	1	42	42	American origin.
White Plymouth Rocks	1	42	42	American origin.
Seabright Bantams	1	34	34	Asiatic origin.

The Brown Leghorns have given the best record, followed by the Langshans, Minorcas and Plymouth Rocks. The European varieties are the best spring and summer layers, but are non-sitters. The Asiatics are winter and early spring layers, good mothers and brooders, and excellent for table purposes. Indeed the Langshan is one of the best all round fowls known.

The Plymouth Rocks and Wyandottes, American fowls, are perhaps the most popular breeds, to-day, in the United States. With us, under confinement, neither of these breeds has maintained its excellent record. The Wyandotte was this year not on trial.

It is difficult to decide the merits of a fowl when confined to close pens and fed only upon vegetable foods raised on the farm. Near a city, where the refuse of the meat market could be obtained daily, a diet could be manipulated, conducive to large egg production, and more thorough tests could be made of each breed; but, after all, the range of lot and fields furnishes nature's pabulum for eggs, and then only can the true merits of a breed be tested.

PRICES OF LIVE STOCK.

The North Louisiana Agricultural Society, at the request of the Station, appointed a committee to establish a tariff of prices, which should govern all sales made by the Station to the farmers of the State. The following are the rates:

A bull calf of any improved breeds	$ 50 00–	$ 75 00
A heifer calf of any improved breeds	75 00–	125 00
A buck or ewe of any improved breeds	5 00–	7 50
Graded buck or ewe of any improved breeds	3 00–	5 00
Pigs of any breed		2 50
Chickens—single		1 50
Chickens—pair		2 50
Chickens—trio		3 00
Chickens—eggs, per setting		1 00
Services of bulls		2 00
Services of bucks		1 00
Services of boar		1 00

Improvements During the Year.

The Laboratory has been thoroughly equipped, and Mr. Maurice Bird, a graduate of University of Virginia, and late chemist of the State and Sugar Experiment Stations, has been placed in charge.

The Station is now ready to make fertilizer and other necessary analyses for the farmers of North Louisiana. During the coming year, the Laboratory will be at work upon the analyses of the typical soils of North Louisiana, in conjunction with the agricultural and geological survey now being prosecuted by the Stations. It has also performed a large amount of work upon the analyses of lint and seed from many varieties of cotton, details of which will appear in a future bulletin.

INCUBATING HOUSE.

A neatly arranged house has been erected for the artificial raising of Poultry.

A small well ceiled room has been provided with improved Incubators, while a larger one with a cemented floor and sunlit roosts has been furnished with "Brooders." In this house the artificial rearing of poultry is going on. The successful raising of "early spring broiling chickens" would add greatly to the wealth of this section, since such chickens bring fancy prices in our markets and are always in demand. Intelligent experience would soon successfully prosecute this enterprise, and no section of the country is better located for such an industry than the dry hills of North Louisiana.

COW STABLES.

With the increase in the number of breeds of cattle, came the necessity for enlarged stables. Accordingly two new stables in separate lots have been erected.

AGRICULTURAL HALL

has been neatly ceiled and made ready for shelves with the view of establishing a permanent Agricultural Museum therein. In this museum not only the products of the Station will be carefully preserved and exhibited, but also samples of all the attainable agricultural products of the country. This will furnish the frequent visitor to the Station information which cannot always be obtained elsewhere.

The North Louisiana Agricultural Society holds its regular monthly meetings in this hall and this new addition will be very valuable for the earnest discussions of various agricultural subjects participated in by farmers from many parishes.

TENANT HOUSES.

It has been found necessary, to meet the growing wants of the Station, to establish houses on the place for its employees. Accordingly two neat, but inexpensive cottages have been erected in the woods East of the orchard, and are now occupied by two faithful employees.

Twenty acres of wood land have been cleared, fenced and made ready for the plow. Of these, five will be added to the experimental grounds, five will be devoted to tobacco, and the rest to pastures and general crops.

TOBACCO GROWING.

Upon consultation with Major R. L. Ragland, of Virginia, the best known authority on tobacco, it has been agreed that bright yellow wrappers can be profitably grown upon the hill lands and fine cigar tobacco upon the bottom lands of North Louisiana. To test the first, five acres of land have been set apart for tobacco culture, seed of selected varieties have been planted and arrangements have been made with the Model Tobacco Barn Co., of Oxford, N. C., to have one of their new barns erected. To do all this successfully, a tobacco expert has been employed who will cultivate and cure the tobacco, at same time giving information to all desiring it on this subject. Later the growing of cigar tobacco somewhere in the bottoms will be tested.

By these experiments it is hoped that a new and profitable industry may be opened to the farmers and planters of this section.

FIELD EXPERIMENT 3.

ROTATION OF CROPS.

How can the worn lands of Louisiana be most speedily and economically restored to their primitive fertility? The answer would be, by a proper rotation of crops with or without fertilizers. What crops shall be selected for this rotation? Any rotation which omits our cow pea would be injudicious. Several years ago the following rotation was decided upon, as the best combination attainable in this section: This rotation is corn, oats followed by cow peas, cotton. This rotation is faulty in principle but correct in practice, and was adopted last season after two years trial. The corn should precede the cotton, but experience has demonstrated that "*rust-proof*" oats, the only variety successfully grown here, must be planted in October if maximum results are desired. Cotton cannot be removed in time for this crop while corn can; hence this metathasis of crops. This rotation was adopted with and without fertilizers. The rotation is a three year's course. It was begun in 1889. Three parallel strips, one-half acre in width and two acres in length, were selected for the experiments. The eastern half of each is manured regularly with a fertilizer adapted to the crop, while the western half remains unmanured.

The following is the condensed results of three years:

Name of Plat.	How Treated.	1889.	1890.	1891.
"A"	Fertilized half.	12 bushels oats. 7½ bushels oats. 8.45 tons peavines. 4.22 tons peavines.	28 bushels corn.	55.2 bushels oats and 1360 lbs. straw. 8.10 tons vines and 4 6 bushels peas.
	Unfertilized half.		20.6 bushels corn.	25.5 bushels oats and 816 lbs. straw. 2.4 tons vines and 1.5 bushels peas.
"B"	Fertilized half.	829 lbs. cotton.	24½ bushels oats and 1020 lbs. straw. 10.2 tons peavines.	1719 lbs. cotton.
	Unfertilized half.	528 lbs. cotton.	8⅞ bushels oats and 710 lbs. straw. 5.6 tons peavines.	620 lbs cotton.
"C"	Fertilized half.	17.73 bushels corn.	708 lbs. cotton.	16.8 bushels corn.
	Unfertilized half.	13.09 bushels corn.	429 lbs. cotton.	4.8 bushels corn.

The fertilizers used under each crop are given in Bulletin No. 8, Second Series. These experiments will be continued for years, in order to determine: First, the renovating influence of such a rotation without the use of fertilizer, and second, the increased influence of same rotation, each crop being fertilized.

The extreme drouth of last year interfered with the yields of corn and oats, and to some extent, with the cotton. Yet the results show marked improvements, particularly in the fertilized rotation. The earlier maturity of the fertilized crops, particularly cotton, was distinctly marked.

COTTON.

Experiments in cotton were of three kinds: First, manurial tests, embracing nitrogenous, phosphatic and potassic fertilizers, and proper depths and time and number of applications of each. Second, varieties best adapted to this soil. Third, distances to be given to secure the largest profit.

Plat No. 1 was devoted to nitrogenous manures. The questions propounded to this plat are:

First—Does this soil need nitrogen to grow cotton profitably?

Second—If so, in what form can it be best presented? In what quantities per acre?

In the plat nitrate of soda and sulphate of ammonia (mineral forms) have been tested with cotton seed meal and cotton seed, raw, rotted and composted (vegetable forms), and with dried blood and fish scrap (animal forms) and such quantities of each taken as to contain 24 and 48 pounds of nitrogen per acre. Where 24 pounds per acre were used, it is denominated as one ration, and two rations where 48 pounds.

There are six groups of four experiments each, viz: First, the nitrogenous fertilizer alone. Second, mixed minerals without nitrogen i. e., a mixture of acid phosphate and kainite. Third, one ration of the nitrogenous fertilizer combined with mixed minerals.

In addition to the above, every tenth experiment has been left unmanured to secure the natural capacity of the soil—a starting point for calculating the benefits of the fertilizers used. By comparing the experiments with nitrogen alone, with those unmanured, we get the benefit of nitrogen uncombined. By comparing the results with nitrogen and mixed minerals, with those from mixed minerals, we get the benefit due to the combined nitrogen. By comparing results of each from combined and uncombined with its own mixed minerals and expressing the results in per centages of the last, the relative merits of each form of nitrogen may be determined. By comparing the results of the one and two rations, approximate ideas as to quantity of nitrogen to be used per acre may be acquired. Were the capacity of the soil of this plat uniform, results could be expressed in pounds instead of per centages. But it is very irregular, as the experiments show.

PREPARATION AND CULTIVATION OF PLAT.

Land thoroughly and deeply broken in January with a two-horse Oliver turn plow, re-broken April 9, with "bull-tongue" plow. April 11, rows marked off 3½ feet apart and four furrows thrown together with large "bull-tongues," bed opened, fertilizer distributed in drill, another furrow run in drill in order to thoroughly incorporate fertilizer with soil, seed sown and covered with harrow, April 16. The after cultivation was given with hoe, side harrow, cultivator, "scooter" and heel scrape and straight shovel and heel scrape. Below are the results per acre:

PLAT No. 1—COTTON—NITROGEN EXPERIMENTS.

Number of Experiment.	Kind and Quantity Manure Used per Acre.	First picking, August 28th.	Second picking, September 8th.	Third picking, October 1st.	Fourth picking, November 10th.	Yield per acre of seed cotton—pounds.
1	160 lbs. nitrate soda	240	450	570	660	1920
2	240 lbs. mixed minerals	220	360	280	360	1220
3	160 lbs. nitrate soda 240 lbs. mixed minerals	220	460	540	550	1770
4	320 lbs. nitrate soda 240 lbs. mixed minerals	140	420	830	1080	2470
5	120 lbs. sulphate ammonia	160	390	560	700	1810
6	240 lbs. mixed minerals	180	380	360	420	1340
7	240 lbs. mixed minerals 120 lbs. sulphate ammonia	240	410	450	440	1540
8	240 lbs. mixed minerals 240 lbs. sulphate ammonia	200	420	680	640	1940
9	No manure	120	260	180	420	980
10	200 lbs. dried blood	160	300	340	350	1150
11	240 lbs. mixed minerals	180	340	280	230	1030
12	200 lbs. dried blood 240 lbs. mixed minerals	360	440	260	170	1230
13	400 lbs. dried blood 240 lbs. mixed minerals	460	540	420	400	1820
14	360 lbs. fish scrap	400	460	340	320	1520
15	240 lbs. mixed minerals	320	320	220	170	1030
16	240 lbs. mixed minerals 360 lbs. fish scrap	340	390	290	230	1250
17	240 lbs. mixed minerals 720 lbs. fish scrap	140	560	120	580	1400
18	230 lbs. cotton seed meal	140	300	400	480	1320
19	240 lbs. mixed minerals	220	280	190	190	880
20	No manure	120	180	180	250	730
21	240 lbs. mixed minerals 360 lbs. cotton seed meal	140	260	340	310	1050
22	240 lbs. mixed minerals 720 lbs. cotton seed meal	140	360	400	470	1370
23	1040 lbs. crushed cotton seed	400	400	280	260	1340
24	240 lbs. mixed minerals	180	260	200	190	830
25	240lbs. mixed minerals 1040 lbs. crushed cotton seed	280	350	650	190	1470
26	240 lbs. mixed minerals 2080 lbs. crushed cotton seed	280	380	760	280	1700
27	1040 lbs. rotted cotton seed	160	320	180	310	970
28	240 lbs. mixed minerals	120	300	80	280	780
29	No manure	20	100	80	220	420
30	240 lbs. mixed minerals 1040 lbs. rotted cotton seed	160	320	110	270	800
31	240 lbs. mixed minerals 2080 lbs. rotted cotton seed	180	360	120	270	930
32	4200 lbs. compost	340	540	120	290	1290
33	240 lbs. mixed minerals	200	300	140	270	910
34	4200 lbs. compost 80 lbs. kainite	440	540	100	250	1330
35	8400 lbs. compost 80 lbs. kainite	540	710	130	330	1710

CONCLUSIONS.

The answer to the first question: Does this soil need nitrogen to grow cotton profitably? is very positive. Both the nitrogen alone and combined with "mixed minerals," give conclusive results. The average of the experiments where no manure was used, is 710 pounds per acre. The average of the nitrogen alone is 1450 pounds, showing a gain due to nitrogen of 705 pounds per acre. The average of the experiments with mixed minerals, is 1003 pounds. The average of one ration of nitrogen (24 pounds), combined with mixed minerals, is 1313 pounds, while that of two rations, (48 pounds), is 1668 pounds, showing an excess due to one ration of nitrogen of 310 pounds, and to two rations, 355 pounds, giving proof of the wants of nitrogen in this soil.

In what form is nitrogen best presented, is not so definitely answered. The excesses of nitrate of soda, uncombined and combined over its mixed minerals are respectively, 700, 550 and 1250 pounds; or 57, 45 and 102 per cent. The excesses of sulphate of ammonia, uncombined and combined, over its mixed minerals are respectively, 470, 200 and 600 pounds; or 35, 15 and 45 per cent. The excesses of dried blood, uncombined and combined, over its mixed minerals are respectively, 120, 200 and 790 pounds; or 12, 19 and 77 per cent. The excesses of fish scrap are likewise, 490, 220 and 370 pounds; or 48, 21 and 36 per cent. over its mixed minerals. Likewise, the excesses of cotton seed meal are respectively, 440, 170 and 590 pounds; or 50, 19 and 67 per cent. over its mixed minerals. Likewise, crushed cotton seed excesses are respectively, 510, 640 and 870 pounds; or 61, 97 and 110 per cent. over the yield of mixed minerals; while rotten cotton seed excesses are 190, 80 and 150 pounds; or 63, 11 and 19 per cent. over the yield of its mixed minerals.

The average per cent of increase due to nitrate soda is 68; the average of sulphate ammonia is 32; the average of dried blood is 36; the average of fish scrap is 35; that of cotton seed meal is 45; that of crushed cotton seed is 56, and that of rotten seed is 31 per cent. Nitrate soda is ahead, followed closely by crushed cotton seed, cotton seed meal and blood. But the average of the two "*mineral*" forms of nitrogen, nitrate soda

and sulphate ammonia, is 50 per cent.; of the two "*animal*" forms, it is 35 and of the three "*vegetable*" forms, it is 44 per cent.

These results declare slightly in favor of the *mineral* forms of nitrogen. But cotton seems to produce well with any form of nitrogen, no matter what its source. Therefore, the vegetable forms, cotton seed meal, cotton seed, etc., are to be preferred, being more convenient and economical.

"What quantity per acre is it best to use?" is answered definitely from a money standpoint.

Estimating seed cotton at 3 cents per pound, (a very liberal estimate) 24 pounds nitrogen (the amount of each ration) at 19½ cents, or $4.70, by calculation there are losses with the double ration in three cases, and profit in four. Concurrent results for three years strongly indicate that on these soils one ration, or twenty-four pounds of nitrogen per acre, is more profitable than larger quantities. There may be seasons when this quantity cannot be assimulated. This plat was planted in Peterkin cotton. The cotton of all plats was planted at the same time. Attention is called to dates and results of pickings.

PLAT NO. 2—COTTON—PHOSPHATE EXPERIMENTS.

Here the various forms of phosphoric acid are used alone and combined, and in quantities of one and two rations. Since every good acid phosphate or dissolved bone must contain a large quantity of gypsum (land plaster), there has been used in two experiments only gypsum, to see how far the results from experiments with acid phosphate or dissolved bones are due to the presence of this substance. In this plat the same questions are propounded with phosphoric acid manures, as are propounded with nitrogen in plat 1, viz: Does this soil need phosphoric acid to grow cotton profitably? 2d. If so, in what form can it be best presented? 3d. In what quantities per acre? Cultivation, preparation, etc., essentially the same as in plat 1. The following are the results:

PLAT No. 2—COTTON—PHOSPHATE EXPERIMENTS.

Number of Experiment.	Kind and Quality Manure Used per Acre.	First picking, August 10th.	Second picking, September 7th.	Third picking, September 30th.	Fourth picking November 14th.	Yield Per Acre of seed cotton—pounds.
1	80 lbs. gypsum	480	550	450	380	1860
2	160 lbs. dissolved bone black	640	680	510	245	1870
†3	480 lbs. cotton seed meal 120 lbs. kainite	240	440	620	480	1780
4	600 lbs. basal mixture 100 lbs. dissolved bone black	160	220	750	80	1930
5	600 lbs. basal mixture 320 lbs. dissolved bone black	480	480	730	815	2500
6	80 lbs. gypsum	380	520	430	380	1710
7	160 lbs. acid phosphate	260	460	520	380	1620
8	600 lbs. basal mixture	400	480	440	380	1700
9	No manure	80	480	480	340	1380
10	600 lbs. basal mixture 160 lbs. acid phosphate	520	460	310	490	1780
11	600 lbs. basal mixture 320 lbs. acid phosphate	560	420	360	350	1690
12	160 lbs. bone meal	400	300	250	580	1330
13	600 lbs. basal mixture	260	380	430	410	1480
14	600 lbs. basal mixture 160 lbs. bone meal	300	440	380	440	1560
15	600 lbs. basal mixture 320 lbs. bone meal	400	300	450	580	1530
16	160 lbs. South Carolina floats	240	280	270	240	1030
17	600 lbs. basal mixture	440	370	230	150	1190
18	600 lbs. basal mixture 160 lbs. South Carolina floats	380	360	310	240	1290
19	600 lbs. basal mixture 320 lbs. South Carolina floats	360	380	200	280	1220
20	No manure	300	200	130	120	730
21	160 lbs Thomas slag			580	175	750
*22	600 lbs. basal mixture			340	330	670
*23	160 lbs. Thomas slag 600 lbs. basal mixture			340	400	740
*24	320 lbs. Thomas slag 600 lbs basal mixture			390	380	770
*25	No manure			70	160	230

*Replanted and later by ten days.

†Basal mixture.

"Does this soil need phosphoric acid?" is answered in the affirmative. The average of no manure is 780, while the average of the phosphates uncombined is 1318 pounds, showing a gain due to phosphates of 538 pounds. Combined with basal mixture (cotton seed meal and kainite) it gives only slightly increased results over the latter, establishing its need with cotton in this soil.

The second question, what form is best to present?" is answered decidedly in favor of the more soluble forms of phosphoric acid, viz: dissolved bone black and acid phosphate.

The third question, "What quantity per acre?" is emphatically answered for the single ration. In every instance, except one, there is a loss with the double ration. It is certain then that phosphoric acid is needed in this soil to grow cotton profitably, and that excessive quantities entail losses.

PLAT NO. 3—COTTON, POTASH EXPERIMENTS.

In this plat potash has been used in the forms of kainite, cotton seed hull ashes, the muriate and sulphate of potash, quantities of each taken so as to represent single and double rations. The same questions are propounded to potash as with nitrogen in Plat 1, viz: 1st. Does this soil need potash to grow cotton profitably? 2d. If so, in what form can it be best presented? 3. What quantity per acre? Cultivation same as Plat No. 1. Following are results:

PLAT NO. 3.—COTTON. POTASH EXPERIMENTS

Number of Experiments.	Kind and Quantity of Manure Used per Acre	First picking, Aug 10th.	Second picking, Sept. 7th.	Third picking, Sept. 30th.	Fourth picking, Nov. 14th.	Yield of seed cotton per acre.
						lbs.
1	240 lbs. cotton seed hull ashes	300	200	140	190	830
2	360 lbs. cotton seed meal 240 lbs. cotton seed hull ashes	280	280	300	410	1270
3	360 lbs. cotton seed meal 480 lbs. cotton seed hull ashes	380	380	260	260	1280
4	120 lbs. cotton seed hull ashes	320	170	120	190	800
5	480 lbs cotton seed meal 240 lbs. acid phosphate	540	340	230	120	1230
6	720 lbs. meal phosphate 120 lbs cotton seed hull ashes	240	260	400	330	1230
7	720 lbs. meal phosphate 240 lbs. cotton seed hull ashes	280	320	260	390	1250
8	No manure	260	180	170	190	800
9	160 lbs. kainite	240	280	220	120	860
10	720 lbs. meal phosphate	240	220	390	360	1110
11	720 lbs. meal phosphate 160 lbs. kainite	160	220	380	400	1160
12	720 lbs. meal phosphate 320 lbs kainite	240	320	350	400	1210
13	40 lbs muriate potash	300	180	120	150	750
14	720 lbs. meal phosphate	340	320	290	130	1080
15	720 lbs meal phosphate 40 lbs. muriate potash	330	340	190	200	1060
16	720 lbs. meal phosphate 80 lbs muriate potash	240	280	270	290	1080
17	No manure	380	220	120	200	820
18	60 lbs. sulphate potash	220	180	200	240	840
19	720 lbs meal phosphate	180	380	360	420	1340
20	720 lbs. meal phosphate 60 lbs. sulphate potash	240	380	308	450	1378
21	720 lbs. meal phosphate 120 lbs. sulphate potash	360	320	400	300	1380

*Meal Phosphate.

The average of "no manures" is 810 pounds, while the average of potash manures is 816 pounds cotton, showing an excess in favor of potash of only 6 pounds. Combined with meal phosphate (cotton seed meal and acid phosphate), it gives only 16 pounds increase over meal phosphate. There is little difference in the yield of the different forms used. The results declare the soil not in want of potash in any form, combined or uncombined for cotton.

PLAT NO. 4.—COTTON. DEPTH OF MANURE.

The questions propounded to this plat are: 1st. What depth shall we apply fertilizers for best results? 2d. Shall they be combined or separated? and incidentally the question is asked, Do fertilizers affect germination in shallow applications? The following are the results:

FIRST PLAT No. 4—COTTON—DEPTH OF MANURES COMBINED.

Number of Experiment.	Kind and Quantity of Manure Used per Acre.	Depths of Appliances.	First picking, September 6th.	Second picking, September 20th.	Third picking, October 22d.	Fourth picking, November 14th.	Yield of cotton in seed per acre.
							lbs.
1	160 lbs. acid phosphate, 40 lbs. muriate potash, 360 lbs. cotton seed meal,	6 to 8 inches.	400	240	160	140	940
2	160 lbs. acid phosphate. 40 lbs. muriate potash, 360 lbs. cotton seed meal.	4 to 6 inches.	340	320	200	260	1120
3	160 lbs. acid phosphate, 40 lbs. muriate potash, 360 lbs. cotton seed meal,	2 to 3 inches	280	500	340	260	1380
4	160 lbs. acid phosphate, 40 lbs. muriate potash. 360 lbs. cotton seed meal.	Top dress'd.	420	470	210	280	1380

Two to three inches and "top dressed" give equal results and best, 6 to 8 inches poorest. These results, with those of previous years declare in favor of shallow application of manures.

PLAT NO. 4.—COTTON—DEPTH OF MANURE USED SEPARATELY.

In this plat cotton seed meal is left off in Experiments 1 and 2, combined in double quantity in 3, and same quantity applied shallow in 4. Following are results:

SECOND PLAT No. 4.- COTTON, DEPTH OF MANURES USED SEPARATELY.

Number of Experiment	Kind and Quantity Used per Acre.	How deeply applied.	First picking, September 6th.	Second picking September 20th.	Third picking, October 22d.	Fourth picking, November 4th.	Yield of seed cotton per acre—pounds.
1	320 lbs. acid phosphate 80 lbs muriate potash	6 to 8 inches.	240	330	240	290	1100
2	320 lbs. acid phosphate 80 lbs. muriate potash	Top dressed.	240	380	270	250	1140
3	320 lbs. acid phosphate 80 lbs. muriate potash 720 lbs. cotton seed meal	2 to 3 inches.	420	500	240	240	1400
4	320 lbs acid phosphate 80 lbs. muriate potash 720 lbs. cotton seed meal	4 to 6 inches. Top dressed.	440	400	200	300	1340

It is claimed that the three chief ingredients of commercial fertilizers have different capacities of diffusion through a soil. Potash becomes fixed as soon as it comes in contact with a soil. Phosphoric acid rarely descends deeper than 2 or 3 inches even when applied in its most soluble form; while nitrogen is very diffusible, rising or falling in a soil, according to the amount of moisture present. It descends with the drainage water, when an excess of the latter prevails, and rises in dry weather with the capillary moisture and is left at or near the surface, when the latter is evaporated. The questions then, are: 1st. At what depth shall we apply our manures to accomplish the greatest availability? 2d. Shall we apply each ingredient separately and at different depths? It is suggested by these experiments, that with a complete fertilizer on these soils the best results are to be obtained by applying at a depth of about 2 to 3 inches; also, that the ingredients be combined. Where cotton seed meal was top-dressed at planting, germination was badly affected.

PLAT NO. 5—COTTON—DISTANCE EXPERIMENTS.

The question propounded to this plat is, what distance shall cotton be planted in drill for best results in this soil. Following are results:

PLAT No. 5—COTTON—DISTANCE.

Number of Experiment.	Distance Apart and Number of Stalks in Drill.	First picking, September 4th.	Second picking, September 20th.	Third picking, October 26th.	Fourth picking, November 17th.	Yield of cotton in seed per acre.
						lbs.
1	One stalk, 8 inches in drill	540	440	320	230	1430
2	Two stalks, 8 inches in drill	750	400	220	160	1530
3	One stalk, 12 inches in drill	700	460	200	120	1480
4	Two stalks, 12 inches in drill	800	470	210	180	1660
5	One stalk, 16 inches in drill	680	500	250	200	1630
6	Two stalks, 16 inches in drill	760	560	280	200	1800
7	One stalk, 20 inches in drill	560	540	250	287	1637
8	Two stalks, 20 inches in drill	660	540	293	265	1753
9	Two stalks, 24 inches in drill	480	580	390	350	1800

The best yields come from Experiments 6, two stalks, 16 inches, and 9, two stalks 24 inches, followed closely by Experiment 8, two stalks 20 inches, and 4, two stalks 12 inches.

The results are not conclusive, but suggest rather more distance for cotton than is ordinarily given.

PLAT NO. 6—COTTON—APPLICATION OF MANURES.

Nitrogen is very soluble. In the soil it is readily converted into ammonia, nitrate and nitrites, in which forms it is available as plant food. But the loose sandy character of this soil and the solubility of nitrogen forces the belief that an unknown quantity of nitrogen is leached out of the soil by heavy rains, and is therefore lost to the plant. The object of this plat is to ascertain if there be any loss, and if there be any value in two or more applications of the nitrogen manures during growth. The applications are made only of nitrogen fertilizers, as potash is stationary in the soil and phosphoric acid nearly so. The mineral mixture (acid phosphate and kainite) is constant throughout. The nitrogen varies in form, but the same quantity of each is applied in second and third applications as in first.

Cultivation same as previous plats. Following are the results:

PLAT NO. 6.—COTTON—APPLICATION OF MANURES.

Number of Experiments.	Kind and Quantity of Manure Used per Acre.	When Applied.	First picking.	Second picking.	Third picking.	Fourth picking.	Yield of cotton in seed per acre.
							lbs.
1	240 lbs. mixed minerals 160 lbs nitrate soda	At planting, April 16th.	540	390	160	160	1250
2	240 lbs. mixed minerals 80 lbs. nitrate soda	At planting, April 16th.	500	290	150	100	1040
	80 lbs. nitrate soda	At laying-by, July 5th.					
3	240 lbs. mixed minerals 53⅓ lbs nitrate soda	At planting, April 16th.					
	53⅓ lbs. nitrate soda	Second working, June 8th.	540	300	170	110	1120
	53⅓ lbs. nitrate soda	At laying-by, July 5th.					
4	240 lbs. mixed minerals 120 lbs sulphate ammonia	At planting, April 16th.	540	360	200	110	1270
5	240 lbs. mixed minerals 60 lbs sulphate ammonia	At planting, April 16th	480	300	220	150	1150
	60 lbs. sulphate ammonia	At laying-by, July 5th.					
6	240 lbs mixed minerals 40 lbs sulphate ammonia	At planting, April 16th					
	40 lbs. sulphate ammonia	Second working, June 8th.	400	270	170	170	1010
	40 lbs. sulphate ammonia	At laying-by, July 5th.					
7	240 lbs. mixed minerals 360 lbs cotton seed meal	At planting, April 16th.	340	380	250	190	1160

PLAT NO. 6.—COTTON—APPLICATION OF MANURES—*Continued.*

Number of Experiments.	Kind and Quantity of Manure Used per Acre.	When Applied.	First picking.	Second picking.	Third picking.	Fourth picking.	Yield of cotton in seed per acre.
8	240 lbs. mixed minerals 180 lbs. cotton seed meal	At planting, April 16th.	400	330	260	170	1160
	180 lbs. cotton seed meal	At laying-by, July 5th					
9	240 lbs. mixed minerals 120 lbs cotton seed meal	At planting, April 16th.					
	120 lbs. cotton seed meal	Second working, June 8th	440	320	230	220	1210
	120 lbs. cotton seed meal	At laying-by, July 5th.					
10	240 lbs. mixed minerals 160 lbs. nitrate soda 120 lbs. sulphate ammonia 360 lbs. cotton seed meal	At planting, April 16th.	240	360	400	380	1360
11	240 lbs. mixed minerals — Plus one-half experiment 10	At planting, April 16th.					
	— Plus one-half experiment 10	At laying-by, July 5th.	380	320	360	300	1360
12	240 lbs. mixed minerals — Plus one-third experiment 10	At planting, April 16th.					
	— Plus one-third experiment 10	At 2d working, June 8th.	480	260	300	270	1310
	— Plus one third experiment 10	At laying-by, July 5th					

The average of one application, 1260 lbs.; the average of two applications, 1177 lbs.; the average of three applications, 1162 lbs. Showing a loss by two applications, 82 pounds, and 97 with three, while two applications give 15 lbs. more than three applications.

PLAT NO 4—COTTON VARIETIES.

There are many varieties of cotton offered yearly on our markets with flowing certificates of great excellence and eulogistic testimonials of high merit. The Station at great cost of time, labor and money has tested 45 varieties of these this year. They were placed under the same conditions and treated as nearly as possible alike. They were fertilized with a mixture consisting of 200 pounds acid phosphate, 200 pounds cotton seed meal and 100 pounds kainite per acre. They were picked and weighed in the field and again at the gin. Each variety was ginned separately on an improved Gullett gin, with feeder and condenser: lint and seed carefully weighed and per cent of each calculated. Attention is called to the comparative yield by pickings, also to loss occuring from field to gin. Following are the results:

Number of Experiment.	Name of Variety.	First picking, August 29th.	Second picking, September 26th.	Third picking, October 21st.	Fourth picking, November 16th.	Total yield of seed cotton per acre in lbs. Field results.	Per cent. seed.	Per cent. lint.	Total number of pounds lint.	Remarks.
1	Truitt's improved	60	600	560	480	1700	67 54	32 46	552	Alexander Seed Co., Augusta. Ga.
2	Welborn's Pet	160	780	470	300	1710	67.47	32.53	556	Alexander Seed Co., Augusta, Ga.
3	Southern Hope	220	740	740	220	1920	66.28	33.72	647	Maj. Thos. McGuire, West Monroe, La.
4	Allen's Long Staple	220	900	360	220	1700	66.25	33.75	574	Alexander Seed Co., Augusta, Ga.
5	Hawkins	180	740	740	325	1980	65 88	34.12	675	Alexander Seed Co., Augusta, Ga.
6	Bancroft's Improved Herlong	360	840	840	230	2270	66.67	33.33	756	Alexander Seed Co., Augusta, Ga.
7	Okra	620	520	520	200	1860	67.81	32.19	599	Alexander Seed Co., Augusta, Ga.
8	Tennessee Gold Dust	540	620	610	200	1970	65 90	34 10	672	Alexander Seed Co., Augusta, Ga.
9	Peterkin	140	540	540	380	1600	62.69	37.31	597	Alexander Seed Co., Augusta, Ga.
10	Rockett's Favorite	460	630	630	160	1860	65.68	34.32	638	J. C. Rockette, Farmerville, La.
11	Eureka	240	520	520	260	1540	68 19	31 81	490	W. B. Humphreys, Keithville, La., and Coltharp, Milliken's Bend, La.
12	Martin's Prolific	420	560	560	190	1730	69.12	30.88	534	Dept. of Agriculture, Washington, D. C.
13	Tennessee Silk	600	470	470	120	1660	66.36	33.64	558	Mr. Prevost, New Orleans, La.
14	Boyd's Prolific	320	620	620	150	1710	65.68	34.32	586	Mr Prevost, New Orleans, La.
15	Ellsworth	280	550	550	145	1710	65.00	35.	598	Mr. Provost, New Orleans, La.
16	S. S. Maxey's	300	540	540	70	1520	66.08	33.92	516	Mr. Prevost, New Orleans, La.
17	Cherry's Cluster	500	340	340	70	14 0	68 00	32.	464	Dept. of Agriculture, Washington, D. C.
18	Cherry's Long Staple	220	360	360	150	1250	66.67	33.33	417	Dept. of Agriculture, Washington, D. C.
19	Herlong Green	720	400	400	180	1090	68 00	32.00	348	T. W. Woods & Sons, Richmond, Va.
20	Jower's Improved	460	380	380	120	1700	67.93	32 07	545	T. W. Woods & Sons, Richmond, Va.
21	Jones' Improved	440	360	360	145	1340	69 70	30 30	406	T. W. Woods & Sons, Richmond, Va.
22	Carolina Pride	560	440	440	125	1300	66.14	33 86	440	T. W. Woods & Sons, Richmond, Va.
23	Ben Smith's Choice	560	480	480	125	1560	67.80	32.20	502	B Smith, Vernon, La.
24	Oats	180	470	470	27	1640	66.67	33 33	547	Ex. Station, Baton Rouge, La.

25	Crawford's	540	500	490	140	1390	68.56	31.74	441	Alexander Seed Company, Augusta, Ga.
26	W. B. Ethridge Small Seed	280	420	420	160	1670	66.67	33 33	557	W. B. Ethridge, Downsville, La.
27	Grayson's Prolific	440	520	520	100	1280	65.00	35.	448	W. B. Grayson, Columbia, La.
28	Little Brannon	240	540	540	275	1585	65.90	34 10	540	Experiment Station, Baton Rouge, La.
29	Herlong, Home-raised	160	620	340	220	1830	61.29	35.71	653	Home-raised.
30	King Prolific	260	710	350	210	1530	68 49	31.51	482	Major McGuire, W st Monroe, La.
31	Jones' Herlong	160	780	380	320	1640	66 94	33.06	542	Mr. Prevost, New Orleans, La.
32	Petit Gulf	60	570	570	435	1635	69.77	30 23	494	Mr. Prevost, New Orleans, La.
33	Dickson	85	665	760	415	1925	68 54	31.46	605	Mr. Prevost, New Orleans, La.
34	Peerless	100	7 0	550	350	1700	67 11	32.89	559	Mr. Prevost, New Orleans, La
35	Shine's Early	200	680	500	310	1690	68.75	31.25	528	Mr. Prevost, New Orleans, La.
36	Herlong	260	540	540	290	1630	67 29	32.71	533	Mr. Prevost, New Orleans, La.
37	Truitt's Premium	220	680	360	170	1430	68.19	31 81	455	Alexander Seed Company, Augusta, Ga.
38	Jones' Prolific, Long Staple	240	590	300	710	1840	65 52	34 48	634	Alexander Seed Company, Augusta, Ga.
39	Fishborne Improved	360	600	300	210	1470	65 76	34.24	503	Mr. East, Slaughter, La.
40	East's Improved Georgia	340	530	230	290	1390	67 20	32.8	446	Mr. East, Slaughter, La.
41	Texas Storm and Drouth Proof	420	310	220	350	1300	64 60	35 4	460	W. B. Smilie, Baileyville, Tex.
42	John O. Morris	440	55.	220	200	1410	67.20	32 80	462	John Morris, Gainsville, La.
43	African	380	580	240	270	1470	67 13	32 87	483	F. H. Reade, Columbia, La.
44	Sea Island	...	240	440	130	810	71.83	28 57	231	Mr. Prevost, New Orleans, La.
45	Peeler	520	510	260	220	1510	67 24	32 76	49	Mr. Prevost, New Orleans, La.

An inspection of the above table shows great differences in yields of seed and lint cotton. Some of these differences are due to variations in soil, it being almost impossible to obtain a piece of land large enough for so many varieties, which would be of uniform fertility. The percentages of seed and lint were determined upon a small gin, and on account of the small amounts of seed cotton ginned in each variety, they are necessarily not exact; they are, however, comparatively approximate. Later results will be given of the actual percentages determined by hand picking the lint, and also the classification and value of each lint.

On application the Station can furnish small quantities of the seed of any of the above varieties.

CORN.

Experiments in corn were of two kinds. First, manurial requirements, both as to the kinds to be used and the modes of application. Second, varieties best suited to our wants.

PLAT NO. 7.—CORN — NITROGENOUS MANURES. PLANTED MARCH 23.

The questions propounded are the same as those asked of cotton in plat 1, viz: "Does this soil need nitrogen to grow corn profitably?" 2d. "If so, in what form must it be presented?" 3d. "What quantities per acre?" As with cotton, the mineral, animal and vegetable forms of nitrogen have been used in single and double rations.

PREPARATION OF LAND, CULTIVATION, ETC.

Land deeply broken with two horse Oliver turn plow in January. Rebroken with bull tongues in March, rows marked off five feet apart, four furrows thrown together with bull tongue, bed opened, fertilizer distributed, run again in same furrow to incorporate with soil, seed planted and covered with harrow. Cultivation done with hoe, side harrows, cultivators, scooters, and heel scrapers. The following are the results:

PLAT NO. 7.—CORN—NITROGENOUS EXPERIMENTS.

Number of Experiments.	Kind and Quantity of Manure Used Per Acre.	Bushels Shelled Corn Per Acre
1	112 pounds nitrate soda	19.07
*2	112 pounds acid phosphate 56 pounds ka nite	13.71
3	168 pounds mixed minerals 112 pounds nitrate soda	15.
4	168 pounds mixed minerals 224 pounds nitrate soda	19.98
5	84 pounds sulphate ammonia	12.75
6	168 pounds mixed minerals	6.86
7	168 pound mixed minerals 84 pounds sulphate ammonia	11.36
8	168 pounds mixod minerals 168 pounds sulphate ammonia	19.92
9	No manure	7.50
10	140 pounds dried blood	8.46
11	168 pounds mixed minerals	5.46
12	168 pounds mixed minerals 140 pounds dried blood	10.92
13	168 pounds mixed minerals 280 pounds dried blood	15.71
14	352 pounds fish scrap	14.02
15	168 pounds mixed minerals	5.46
16	168 pounds mixed minerals 252 pounds fish scrap	10.09
17	168 pounds mixed minerals 504 pounds fish scrap	18.00
18	No manure	4.50
19	252 pounds cotton seed meal	10.12
20	168 pounds mixed minerals	5.57
21	168 pounds mixed minerals 252 pounds cotton seed meal	10.
22	168 pounds mixed minerals 504 pounds cotton seed meal	11.67
23	728 pounds crushed cotton seed	7.71
24	168 pounds mixed minerals	3.
25	168 pounds mixed minerals 728 pounds crushed cotton seed	7.85
26	168 pounds mixed minerals 1456 pounds crushed cotton seed	10.30
27	728 pounds green cotton seed	6.21
28	168 pounds mixed minerals	3.86
29	168 pounds mixed minerals 728 pounds green cotton seed	6.21

*Mixed minerals.

PLAT NO. 7.—CORN—NITROGENOUS EXPERIMENTS—*Continued.*

Number of Experiments.	*Kind and Quantity Manure Used Per Acre*	Bushels Shelled Corn Per Acre
30	168 pounds mixed minerals 1456 pounds green cotton seed	8.36
31	No manure	1.72
32	2940 pounds compost	5.16
33	168 pounds mixed minerals	1.50
34	2940 pounds compost 56 pound kainite	5.36
35	5880 pounds compost 56 pounds kainite	12.21
36	720 pounds rotten cotton seed	6.42
37	168 pounds mixed minerals	3.75
38	168 pounds mixed minerals 720 pounds rotten cotton seed	7.50
39	168 pounds mixed minerals 1440 pounds rotten cotton seed	10.50
40	No manure	3.85

It is hardly fair to attempt deductions from results obtained during so prolonged a spell of drought. The yields have been very low, but even here we have decided replies in regard to the benefits of nitrogenous manures under corn on this soil. The form in which it should be used and the quantity per acre are not clearly emphasized, particularly the latter, the absence of moisture preventing a full utilization of even one ration. It is always hazardous on light sandy soil, to manure corn heavily since water in large quantities will be required to render the latter available and this substance is rarely furnished by nature in proper quantities and distribution, during the growing season.

PLAT NO. 8—PHOSPHORIC ACID EXPERIMENTS.

In this plat the same questions are propounded to phosphororic acid as were propounded to cotton in plat 1, viz: "Does this soil need phosphoric acid to grow corn profitably?" 2d.

"If so, in what form must it be presented?" 3d. "In what quantities per acre?" Cultivation, etc., same as Plat No. 7.

Attention is directed to the difference in experiments with fertilizers and no manures throughout the corn experiments. The drought reduced all yields greatly, but the effects of fertilizers is striking.

Below are the results:

PLAT NO. 8—PHOSPHORIC ACID EXPERIMENTS.

No. of Experiments.	Kind and Quantity Manure Used Per Acre.	Bushels Shelled Corn Per Acre.
1	56 pounds Gypsum	15.
2	112 pounds dissolved bone black	12.75
*3	336 pounds cotton seed meal 84 pounds kainite	14.25
4	420 pounds basal mixture 112 pounds dissolved bone black	12.75
5	420 pounds basal mixture 224 pounds dissolved bone black	12.75
6	56 pounds gypsum	6.
7	112 pounds acid phosphate	5.25
8	420 pounds basal mixture	10.50
9	No manure	4.50
10	420 pounds basal mixture 112 pounds acid phosphate	15.75
11	420 pounds basal mixture 224 pounds acid phosphate	12.
12	112 pounds bone meal	10.50
13	420 pounds basal mixture	13.50
14	420 pounds basal mixture 112 pounds bone meal	15.75
15	420 pounds basal mixture 224 pounds bone meal	18.75
16	112 pounds South Carolina floats	6.75
17	420 pounds basal mixture	14.25
18	420 pounds basal mixture 112 pounds South Carolia floats	15.
19	420 pounds basal mixture 224 pounds South Carolina floats	16.50
20	No manure	6.75
21	112 pounds Thomas Slag	5.25
22	420 pounds basal mixture	9.75
23	112 pounds Thomas Slag 420 pounds basal mixture	9.80
24	224 pounds Thomas Slag 420 pounds basal mixture	10.50

* Basal mixture.

CONCLUSIONS.

The results, if any positive ones can be drawn from these experiments are similar to those given under cotton.

PLAT NO. 9.—CORN—POTASH EXPERIMENTS.

In this plat the same questions are propounded to potash as were propounded to cotton in Plat 1, viz: Does this soil need potash to grow corn profitably? 2. If so, in what form must it be presented? 3d. In what quantities per acre? Cultivation, etc., same as in Plat 7. Below are results:

PLAT NO. 9—POTASH EXPERIMENTS.

Number of Experiment.	Kind and Quantity of Manure Used per Acre.	Bushels shelled corn per acre.
1	84 pounds cotton seed hull ashes	6.75
*2	336 pounds cotton seed meal 168 pounds acid phosphate	15.
3	504 pounds meal phosphate 84 pounds cotton seed hull ashes	13.50
4	504 pounds meal phosphate 168 pounds cotton seed hull ashes	16.50
5	No manure	8.25
6	112 pounds kainite	6.75
7	504 pounds meal phosphate	16.50
8	504 pounds meal phosphate 112 pounds kainite	15.75
9	504 pounds meal phosphate 224 pounds kainite	15.75
10	28 pounds muriate potash	7.25
11	504 pounds meal phosphate	14.25
12	504 pounds meal phosphate 28 pounds muriate potash	12.75
13	504 pounds meal phosphate 56 pounds muriate potash	15.
14	No manure	7.75
15	42 pounds sulphate potash	6.25
16	504 pounds meal phosphate	13.50
17	504 pounds meal phosphate 42 pounds sulphate potash	12.00
18	504 pounds meal phosphate 84 pounds sulphate potash	12.00

*Meal phosphate.

CONCLUSIONS.

There is a financial loss with potash on corn, both alone and combined. Experiments declare that potash is not needed in this soil, in any form or quantity to grow corn.

PLAT NO. 10—CORN—APPLICATION OF MANURES.

No. of Experiment.	Kind and Quality Manure Used per Acre.	When Applied.	Bushels Shelled Corn per Acre.
1	168 pounds mixed minerals 112 pounds nitrate Soda	at planting Mar 23.	15.75
2	168 pounds mixed minerals 56 pounds nitrate soda	at planting Mar 23.	18.
	56 pounds nitrate soda	at laying by, June 1	
3	168 pounds mixed minerals 37½ pounds nitrate soda	at planting Mar 23.	19.50
	37½ pounds nitrate soda	2d working May 14.	
	37½ pounds nitrate soda	at laying by, June 1	
4	168 pounds mixed minerals 84 pounds sulphate ammonia	at planting Mar 23.	16.50
5	168 pounds mixed minerals 42 pounds sulphate ammonia	at planting Mar 23.	18.
	42 pounds sulphate ammonia	at laying by June 1	
6	168 pounds mixed minerals 28 pounds sulphate ammonia	at planting Mar 23.	20.25
	28 pounds sulphate ammonia	2d working May 14.	
	28 pounds sulphate ammonia	at laying by.	
7	158 pounds mixed minerals 252 pounds cotton seed meal	at planting	14.25
8	168 pounds mixed minerals 126 pounds cotton seed meal	at planting	12.75
	126 pounds cotton seed meal	at laying by	
9	168 pounds mixed minerals 84 pounds cotton seed meal	at planting	12.
	84 pounds cotton seed meal	2d working	
	84 pounds cotton seed meal	at laying by	
10	168 pounds mixed minerals 112 pounds nitrate soda 84 pounds sulphate ammonia 252 pounds cotton seed meal	at planting	19.50
11	168 pounds mixed minerals —Plus one-half No. 10 —Plus one-half No. 10	at planting	18.
12	168 pounds mixed minerals —Plus one-third No. 10	at planting	19.50
	—Plus one third No. 10	2d working	
	—Plus one-third No. 10	at laying by	

CONCLUSIONS.

The average of one application is 16.5 bushels.

The average of two applications is 16.8 bushels.

The average of three applications is 17.8 bushels.

The excess of two applications over one is .3 bushels; of three over one is 1.3 bushels, and of three over two is 1 bushel. Results of previous years declared positively for different applications. The very dry year perhaps prevented the full availability

of the second and third applications. We should still conclude it best, however, to divide nitrogen fertilizers intended for corn, and apply at different times during growth.

PLAT NO. 11.—CORN VARIETIES.

This plat was fertilized with the Station's compost for corn in drill at time of planting, at rate of 40 bushels per acre. Each variety was weighed in the shuck; ten average ears were then shucked and shelled, shuck, corn and grain weighed separately and per cent of each calculated. The value of a corn depends largely upon its per cent. of grain. Preparation, cultivation, etc., same as Plat 7. Following are the results:

RESULTS OF PLAT 11—VARIETIES OF CORN.

No. of Experiment.	Name of Variety.	Where Obtained.	Per Cent of Grain.	Per Cent of Cob.	Per Cent of Shuck.	Bushel Shelled Corn Per Acre.	Kind of Corn.
1	McQuade	From John McQuade, Baton Rouge	75.20	15.70	9.3	28.7	White Dent.
2	Banks' Improved Stock	Jenkens & Trobaugh, Fayetteville, Tenn	76.50	17.80	6.5	30.7	Strawberry.
3	Giant Broad Grain	T. W. Wood & Son, Richmond, Va	76.40	18.2	7.	27.6	White Dent.
4	Shoe Peg White	T. W. Wood & Son, Richmond, Va	78.42	14.30	7.5	29.6	White Dent.
5	Jeff. Welborn's Conscience	Alexander Seed Company, Augusta, Ga	78.40	13.20	8.4	28.8	White Dent.
6	Clarke's Early Mastodon	Alexander Seed Company, Augusta, Ga	76.20	15.30	9.	25.2	Yellow Dent.
7	Calhoun Red Cob	A. Calhoun, Calhoun, La	75.30	13.20	11.40	28.7	Shoe Peg & Red Cob.
8	Blount's Prolific	N. S. Dougherty, Baton Rouge, La	75.80	15.20	8.80	25.2	White Gourd Seed.
9	Mosby's Prolific	Department of Agriculture, Washington	79.60	11.40	8.2	28.4	White Dent.
10	Patterson's Prolific	R. F. Patterson, Baton Rouge, La	75.	13.51	10.40	25.4	White Dent.
11	Alabama	From Alabama	73.20	16.50	9.4	15.	White Dent.
12	Western Yellow	L. Soniat, Jefferson, La	73.60	15.40	9.50	14.6	Yellow Dent.
13	Golden Beauty	R. Frotscher, New Orleans, La	78.	12.40	9.2	13.6	Yellow Dent.
14	Champion White Pearl	Alexander & Co., Augusta, Ga	76.40	13.20	9.8	10.2	White Dent.
15	Hickory King	R. Frotscher, New Orleans, La	75.80	14.40	9.2	14.7	White Flint.
16	Camp's Prolific	N. S. Camp, Ouachita, Parish, La	73.40	15.60	9.70	17.8	White Dent.
17	Stowe	Mr. Parkman, Ouachita Parish, La	80.	11.40	9.1	18.2	White Dent.
18	Golden Dent Gourd Seed	R. Frotscher, New Orleans	78.49	12.	9.30	7.8	Yellow Gourd Seed.
19	Champion	Alexander Co., Augusta, Ga	71.50	16.4	10.30	16.6	White Flint.
20	Vermillion White	From Vermillion Parish	75.	15.5	9.4	16.	White Dent.
21	Mexican Creole	D. R. Calder, New Orleans					Yellow Flint.
22	White Mexican	D. R. Calder, New Orleans	73.80	16.8	9.4	9.	White Dent.
23	Mexican White Flint	D. R. Calder, New Orleans	73.20	16.9	9.25	12.8	White Flint.
24	Hendron's White Bread	Jenkens & Trobaugh, Fayetteville, Tenn	75.30	15.4	9.5	10.7	White Dent.
25	Chamberlin's Prolific	Mr. Chamberlin, West Baton Rouge	74.60	17.20	8.40	11.6	White Flint.
26	White Normandy	Department of Agriculture	76.60	16.40	9.	10.71	White Dent.
27	Southern Prolific	From New Orleans	76.20	16.30	8.	11.2	White Flint.
28	McClendon's Shoe Peg	From R. W. McClendon, Ouachita	79.40	12.	8.	13.6	White Shoe Peg

An inspection of this table will be of interest to every farmer and planter. Only such corn should be grown which will yield the largest amount of shelled corn. It is perhaps superfluous to mention here, that Northern grown corn rarely succeeds well in the South the first year or two after introduction. For an early crop, or a late planting, such seed, however, will often be found useful.

PLAT NO. 13

was devoted to the following

FORAGE PLANTS:

Teosinte (Reana Luxurians); Pearl Millet (Penicillaria Spectata), Kaffir Corn, Jerusalem Corn, Millo Maize, Large African Millet, Rural Branching Sorghum, Egyptian Rice Corn, German or Golden Millet, Golden Wonder Millet, Japanese Buckwheat, Desmodium Molle, Soja Bean, Prolific Tree Bean; and the following Sorghums: Early Amber, Early Orange, New Orange, Kansas Orange, White India, Golden Rod and Coleman.

On account of the severe drought none of these crops this year gave large results. Indeed, they were all reduced to at at least 50 per cent on normal yields.

For history and characteristics of above crops, see Bulletin No. 8, Second Series. The Station can furnish small quantities of the above seed on application. The Soja Bean for the first time gave good results.

PLAT No. 14--SUNDRY CROPS.

There are planted in this plat one variety of peanuts, one of chufas and eleven of field peas.

Spanish Peanut—A desirable variety, early, a fine bearer, growth perfectly erect, not spreading on the ground like the common kinds of peanut, and therefore easily cultivated, the plow doing all the work. Also, in harvesting, all the peas hang to the root and can be rapidly gathered. Planted in April they

ripen in August, and planted as late as July 1st to 10th, will mature full crops before frost. Therefore, they are useful to follow after oats. The stems grow erect, are easily harvested for forage, making the richest quality of hay. The pea is smaller than the Virginia peanut, but very sweet, fills out well, makes no pops. Can be planted close in the row and in the drill, yielding largely per acre. Splendid to fatten hogs and children. The vine retains its greenness much longer than other varieties, suggesting its superiority for forage.

The present year, three large wagon loads were gathered from less than one-quarter acre, supplying a large quantity of forage, hard to excel in nutritive and palatable value, all stock eating it with great relish.

COW PEAS.

This crop is highly prized for fertilizing purposes among the sugar planters of South Louisiana, but elsewhere throughout the South it does not receive one-half the attention which its valuable properties should merit. In time it is hoped that its economical position in Southern agriculture will be fully understood.

The following varieties were this year grown:

"Pea of the Backwoods, or the Old Man's Friend—This pea was brought to notice several years ago by the letters of Mr. Edward Fonville, of Onslow county, N. C., in the *Southern Cultivator*. It was recommended as the earliest bunch pea, and excellent for table use. It has proved, two weeks ahead of any other, a large bearer, and a shell pea for table use, tender, marrowy and palatable. Are ripe for table use just six weeks after planting. It is a bunch pea strictly, therefore afording not much vine. The seed are small, cream colored, slightly 'pied.' Very prolific."

At Calhoun it matured in forty days.

"The Unknown Pea—Is of greenish white color, with blue eye, full size, makes much vine, vigorous growth, large bearer.

Pods long and very full, and in favorable seasons continues to make or bear fruit during several weeks. It is a very fine pea, worthy to come into general use. The Boss Pea advertised a few years since proved to be identical with the Unknown."

At Calhoun it is very late bearing, but gave heavy yield of peas and exceedingly heavy foliage.

Dwarf Whippoorwill Pea—A bunch pea, with but little vines, Begins fruiting in fifty or sixty days. Berry speckled, pods long and full, yield good.

Clay Pea—Vines and foliage medium. Begins fruiting ni seventy-five days. Yield good. Berry cream colored with white eye, medium in size. Pod of medium length and not crowded, keeps well.

Lady Pea—A small white pea, white eye, with considerable vine of medium foliage. Begins fruiting in ninety days from time of planting.

White Prolific Pea—Vines large; foliage heavy; yield of peas good. Bears in eighty to ninety days. Berry large and closely resembling the next variety.

Large White Pea—Vines and foliage heavy; very late fruiting. A large white pea and very prolific.

Indian Pea—A large "liver and white pied" with long and crowded pods. Very prolific. Vines and foliage heavy. Begins fruiting in sixty to ninety days. Berry soft and does not keep well.

King's Pea—A large black and white pied pea. Large and crowded pod. Vines and foliage heavy. Very prolific. Begins fruiting in sixty to seventy days. Berry too soft to keep well.

Red Ripper Pea—A large red pea, with long and crowded pods. Vines and foliage medium. Bears fruit in seventy-five days.

Blue Pea—A small blue pea, medium vine and foliage. Very prolific and early. Will bear in nine weeks.

The Conch Pea was also planted. It failed to mature a poor crop of pods. It is a tremendous "*viner*."

Plat No. 15—Sweet Potatoes.

The following varieties of Sweet Potatoes were planted and fertilized with mixture of 300 pounds cotton seed meal, 100 acid phosphate and 100 of kainite. They were treated as nearly as possible alike. Below are the results of the varieties:

Bunch Yam, from Mississippi, 54.7 bushels per acre.
Bunch Yam, home-raised, 75.8 bushels per acre.
Pumpkin Yam, home raised, 120.5 bushels per acre.
Texas Yam, home-raised, 130.6 bushels per acre.
Brazillian Yam, home-raised, 170.8 bushels to the acre.

Bunch Yam, No. 1, was received from Burkitt & Sons, Abbott, Miss.; Bunch Yam, No. 2, received from Mr. Tom Roberts, Downsville, La.; Pumpkin Yam, from M. J. Parkman, Calhoun, La.; Texas Yam, from L. T. Sanders, Plain Dealing, La.; Brazillian Yam, from L. M. Calhoun, Calhoun, La.

Grains, Grasses and Clovers.

Six acres of Rust-proof Oats and Winter Grazing Barley, three acres of each, were planted in the fall of 1890, on well prepared ground previously planted in corn and peas. The first acre of each was fertilized with 200 pounds cotton seed meal, and 100 pounds acid phosphate, mixed and scattered broadcast and plowed in with oats. The second acre was left unfertilized, and the third or last acre was top-dressed with same mixture in February. The following are the results:

FERTILIZER EXPERIMENTS WITH OATS AND BARLEY.

Number of Experiment	Name of Variety	Kind and Quantity Manure Used per Acre	Bushels of grain per acre.	Pounds of straw per acre.
1	Red Rust-proof Oats.	200 pounds cotton seed meal 100 pounds acid phosphate at planting	46.75	1224
2	Red Rust-proof Oats.	No manure	25.50	680
3	Red Rust-proof Oats.	200 pounds cotton seed meal 100 pounds acid phosphate top dressed in February	38.25	952
4	Winter Barley.	200 pounds cotton seed meal 100 pounds acid phosphate at planting	10	640
5	Winter Barley.	No manure	6	520
6	Winter Barley	200 pounds cotton seed meal 100 pounds acid phosphate top-dressed in February	9	590

The following are the results with the different varieties of grain. They were all planted at the same time, treated alike and fertilized with top dressings of nitrate soda, sulphate ammonia, cotton seed meal and acid phosphate and kainite:

RESULTS OF VARIETIES OF GRAIN.

No. Experiment.	Name of Variety.	Bushels Grain Per Acre.	Pounds of Straw Per Acre.
1	White Russian wheat	28.33	2720
2	Mediterranean wheat	15.86	2584
3	Golden Cross wheat	11.33	2040
4	Early Red Clawson wheat	6.8	1836
5	Saskatchowan wheat	15.86	2312
6	Winter Excelsior Rye	5.66	1292
7	Prince Edward Island Oat	14.73	2788
8	Japan Rice	10.4	1820

Golden Cross and Early Red Clawson wheats rusted badly, Mediterranean, Saskatchowan slightly, and White Russian scarcely at all.

The following varieties of grasses and clovers were made into hay June 8. Very dry weather prevented a second cutting. For descriptions, see Bulletin No. 8, Second Series.

RESULTS OF GRASSES AND CLOVERS.

No. Experiment.	Name of Variety.	Pounds of Hay Per Acre.
1	Red Clover, (Trifolium Pratense)	3264
2	Crimson Clover (Trifolium Incarnatum)	3170
3	Lucerne (Medicago Sativa)	1360
4	English Rye Grass (Lolium Perenne)	2652
5	Italian Rye Grass (Lolium Italicum)	4750
6	Red Top (Agrostis Vulgaris)	2250
7	Meadow Festuca (Festuca Pratensis)	2240
8	Kentucky Blue (Poa Pratensis)	476
9	Texas Blue (Poa Arachnifera)	3468
10	Timothy (Phleum Pratense)	2216
11	Tall Meadow Oat (Avena Elatior)	3060
12	Orchard (Doctylis Glomerata)	2448
13	Yellow Oat (Avena Flavescens)	952
14	Velvet (Holcus Lanatus)	1224
15	Crested Dog's Tail (Cynosurus Crystatus)	272
16	(Bromus Inermis)	2040

MELONS.

CUCUMIS MELO.

Land well prepared and fertilized in hills with compost, planted April 1, 1891. The severe drouth prevented anything like good results.

Florida Seminole—From R. Frotscher, N. O., was the first to ripen, June 17. Light color, productive, medium large, oblong, medium good flavor, good melon.

Florida Favorite—From Frotscher, N. O.; oblong, dark rind with green stripes, prolific, early and well flavored.

Georgia Rattlesnake—Frotscher, N. O.; large, oblong, light rind, green stripes, dark seed, early, and fine.

Jordan's Grey—Alexander Seed Co., Augusta, Ga.; large, round, white, yellow seed, medium early, prolific, sweet and luscious.

Pride of Georgia—Alexander, Augusta, Ga.; large, round to oblong, very productive, light green with dark stripes, splendidly flavored, red meat.

Augusta Rattlesnake—Alexander; large, oblong, light, with heavy green stripes, early, prolific, well flavored.

Johnston's Rattlesnake—T. W. Wood & Son, Richmond, Va.; it is a good melon and prolific bearer, of medium size, pale green rind, with dark stripes.

Large Black Spanish—An early melon, but the flavor does not compare favorably with other melons tested.

Johnston & Stokes, Philadelphia, Pa., sent us the three following varieties, which were not satisfactory in this climate and soil:

Jersey Blue—An inferior melon in every respect.

Johnson's Dixey—A poor bearer and undesirable flavor.

Dark Iceing—Had neither size, flavor, nor productiveness to recommend it.

John L. Childs, New York, N. Y., sent the following:

Ruby Gold—A prize variety; proved to be not only unique in appearance, but delicious in flavor. This melon is a novelty in coloring, being a deep golden color, with delicate shadings of red about the heart, with light green rind. It grew medium large in this soil.

Hungarian Honey—An inferior quality and size.

Stoke's Extra Early—Also inferior, ripens late.

CANTALOUPES.

From Richard Frotscher, New Orleans, La.:

New Orleans Market—Large, excellent flavor and very prolific.

Peossean Cassaba—A good variety, medium prolific.

White Japan—An attractive looking melon, but poor flavor.

From Johnston & Stokes, Philadelphia:

Prolific Netted—An early variety, good flavor, but small.

Jenny Lind—A very sweet, prolific, late melon.

Golden Gem—Small and round, ripens very early.

Netted Beauty—A handsome melon, very sweet, medium bearer.

Johnston's Colorado—A prolific melon, but of inferior flavor.

Johnston's Superb—Prolific bearer, but quality of melon inferior, also poor flavor.

It has been noticeable in our experiments that all seed from New Orleans and Georgia gave better results than those from Northern firms, proving that Southern grown seed are preferable for the South.

STRAWBERRIES.

Lida—A small pointed berry, growing in clusters, inferior size and flavor and not prolific in our soil.

Ohio—Medium size, poor bearer, though berries were pleasantly flavored.

Henderson's Early—An early berry, of slender, oblong shape. It proved an excellent bearer; the foliage is luxuriant; ripened first week in May.

Mammoth—As its name would indicate, it is of great size and proved true to its record of last year. Berries ripen about last of May.

Pioneer—A scarlet berry, of agreeable acid flavor, firm on calyx. This variety was affected by drought. Ripened 14th of April.

Kentucky—A favorite, late variety; in spite of drought bearing from 1st of May until late in June. Long crimson berry; delicious flavor.

Jessie—Was seriously affected by drought and seemed to have deteriorated in flavor and size, not fulfilling expectations as last year, when it was the most successful variety on the Station. Berries ripened on 14th of April.

Charles Downing—A berry of medium size, flavor and productiveness.

Mount Vernon—A late berry, sweet, mild flavor, easily stemmed, medium bearer.

Coville—Very good, medium size berry affected by drought seriously.

Excelsior—A berry that makes up in quality what it lacks in quantity. It is beautifully shaped and colored.

Belmont—A prolific berry that ripens first week in May, and bears until middle of June.

Crescent Seedling—A very prolific bearer that ripened 13th of April and bore quantities of small berries; pleasantly acid; firm on calyx; bears in clusters.

Ontario—Large round berry, resembling the Jessie; late mediocre bearer.

Capt. Jack—Ripens early in April; ordinary in size, flavor and productiveness.

Haverland—Ripened first week in May, and proved the best variety this year; a long, large berry; delicious flavor, very prolific.

May King—Resembles Pioneer in color and size; medium bearer.

Bomba—Proved better than last year; is a large round berry, of fine flavor.

Bidwell—A variety of poor flavor, bearing small quantities of fruit.

Sharpless—Proved a good bearer; medium sized berries.

Haverland Seedling—Gave satisfaction, being very prolific; large berries, of fine flavor; ripens late.

The prolonged drought affected the results of the berries very seriously.

IRISH POTATOES.

In North Louisiana little or no progress has been made in "Truck Growing," though the soil is extremely well adapted to the growth of both fruits and vegetables, and railroad facilities

are rapidly increasing. With intelligent yeomanry, anxious to develop this country, and seeking by every means within their power to improve their agricultural methods, this section of the State offered superior inducements for a complete series of experiments in fruits and vegetables. Of the latter, the "Irish Potato" was selected as worthy of our first investigations, and results of numerous experiments are herein given.

The experiments were of four kinds:

1st. To test variety of potato best adapted to this soil and climate.

2d. To test size of the potato best adapted for seed.

3d. To determine the fertilizer best adapted to the potato on this soil.

4th. To determine the money value and profits of a crop of potatoes.

The first two are purely physiological experiments, the third chemical, and fourth economical.

FIRST SERIES—PHYSIOLOGICAL.

VARIETIES BEST ADAPTED TO THIS SOIL.

The soil was a loose gray sand, very poor. Previous culture, Potatoes. Broken with two horses. Rows laid off three feet apart, with straight shovel, into these furrows the fertilizer was evenly distributed by hand and covered with two furrows of turn plow. This was opened again with straight shovel and into this furrow pieces of potatoes, cut to three or four eyes, were dropped, twelve inches apart and covered with a turn plow. The fertilizer used was 700 pounds per acre, of a mixture consisting of 400 pounds cotton seed meal, 200 pounds acid phosphate and 100 pounds kainite. The seasons were very poor, no rain after 15th of April. It received one cultivation with hoe and two with plow.

TABLE GIVING YIELD PER ACRE OF VARIETIES OF IRISH POTATOES.

Number.	Varieties.	Culls.	Merchantable	Total.	Ripe.
1	Banana	34.7	22.1	56.8	June 5.
2	Magnum Bonum	48.3	20.4	68.7	June 5.
3	Vt. Early Rose	50.	15.6	65.6	May 25.
4	White Star	44.2	18.3	62.5	June 1.
5	Queen of Roses	47.8	19.3	68.1	May 28.
6	Late Favorite	52.3	18.7	71.0	June 10
7	Early Essex	39.8	20.2	60.0	May 5.
8	Dictator	48.9	17.8	66.7	June 1.
9	Wilder's Early	37.8	21.2	59.0	June 1.
10	Rural Blush	49.8	20.3	70.1	June 5.
11	Vt. Beauties	48.7	21.2	69.9	June 5.
12	Burbank	42.7	20.9	63.6	June 5.
13	Empire State	50.8	18.9	69.7	June 5.
14	English Kidney	52.7	19.2	72.9	June 8.
15	Beauty of Hebron	54.9	18.7	73.6	June 1.
16	Dakota Red	52.7	17.8	70.5	June 5.
17	New Queen	53.8	16.9	70.7	June 5.
18	White Flower	41.2	17.8	59.0	June 5.
19	Potentate	54.7	15.2	70.9	June 5.
20	Chas. Downing	53.8	20.2	74.0	June 1.
21	Pearl of Savoy	54.8	21.3	76.1	June 5.
22	Early Ohio	57.4	23.6	81.0	May 25.
23	Cayuga	59.3	14.7	74.0	June 5.
24	Rochester Favorite	58.7	20.1	78.8	June 5.
25	Early Dawn	39.7	24.8	64.5	June 1.
26	Extra Early Vermont	49.8	21.4	71.2	May 25.
27	Thorburn	32.	25.6	57.6	June 5.
28	Calhoun's Superb	59.4	20.1	79.5	June 5.
29	Scotch Bruffin	63.	18.9	81.9	June 5.
30	Mason's Seedling	61.3	17.8	79.1	June 5.
31	Garrison's Seedling	70.1	14.2	84.3	June 5.
32	Silver Skin	33.	29.4	62.4	June 5.
33	Carpenter's Seedling	49.7	21.2	70.9	June 5.
34	Great Eastern	68.4	21.2	89.6	June 5.
35	White Elephant	71.3	20.2	91.5	June 1.
36	Peerless	79.4	19.3	98.7	June 1.

Potatoes were planted February 20, harvested June 12. Estimated with last year's crop, only about one-fourth of a crop was harvested on account of dry weather.

REMARKS.

No. 1. Banana—Light yellow, long, knotty, many culls, well developed eyes, poor bearer.

No. 2. Magnum Bonum—Large, round, irregular surface, few culls, few deep set eyes, good bearer, yellow skin.

No. 3. Vt. Early Rose—Oblong, medium size, many eyes, very early, pink skin.

No. 4. White Star—Medium, long, white skin, numerous eyes.

No. 5. Queen of Roses—Fine, round and flat, deep pink skin, numerous well marked eyes.

No. 6. Late Favorite—Large, round, red skin, few eyes.

No. 7. Early Essex—A medium oblong, yellow skin, many eyes, very early.

No. 8. Dictator—Large, round potato, white skin, few eyes.

No. 9. Wilder's Early—Large, oblong, flesh skin, eyes well marked.

No. 10. Rural Blush—Irregular round, well marked eyes, pink tinge, good bearer, sound.

No. 11. Vt. Beauty—Medium large, well marked eyes, deep pink tinge.

No. 12. Burbank—Good size, round, smooth potato, pink tinge, well marked pink eyes, a good bearer, sound.

No. 13. Empire State—Oblong, white skin, many eyes.

No. 14. English Kidney—Above medium size, round, with irregular surface, yellow skin.

No. 15. Beauty of Hebron—Oblong, many deep set pink eyes, medium size, good bearer.

No. 16. Dakota Red—Large, round, with flattened ends, light red, numerous well marked eyes.

No. 17. New Queen—Large, round, white skin, deep eyes.

No. 18. White Flower—Oblong, medium, yellow skin, poorly marked eyes and few of them.

No. 19. Potentate—Medium, irregular potato, cream skin, few eyes.

No. 20. Chas. Downing—Large, round, light yellow, numerous eyes well marked.

No. 21. Pearl of Savoy—Oblong, medium potato, pink, well marked eyes.

No. 22. Early Ohio—Large, round, smooth pink, very early, well marked eyes.

No. 23. Cayuga—Large, knotty, irregular, prolific.

No. 24. Rochester Favorite—Large, oblong, smooth white potato, few culls, no rot.

No. 25. Early Dawn—Long pointed, medium size, smooth, white, inclined to rot.

No. 26. Extra Early Vermont—Medium, oblong to egg-shaped, smooth, pink, resembles Early Rose.

No. 27. Thorburn—Small, oblong, many eyes, yellow; poor potato.

No. 28. Cullum's Superb—Excellent, large, oblong potato, smooth flesh color, resembles Early Rose, well marked eyes, few culls.

No. 29. Scotch Bruffin—Large oblong, cream color, many deep set eyes.

No. 30. Mason's Seedling—Medium, oblong, flattened, yellow, with pink tinge about the numerous well marked eyes.

No. 31. Garrison's Seedling—Large, irregular, few well marked eyes, white.

No. 32. Silver King—Medium, oblong, with smooth regular surface; rots easily.

No. 33. Carpenter's Seedling--Long, round, cream color, few eyes.

No. 34. Great Eastern—Large, irregular, few eyes, poorly marked, yellow.

No. 35. White Elephant—Very large, white, numerous well marked eyes.

No. 36. Peerless—Large, round, prolific bearer, easily kept, white, very sound.

SECOND SERIES—PHYSIOLOGICAL.

Shall we plant the whole potato or cuttings, and what size of each are most productive and economical? Seven varieties of potatoes were used, each being treated exactly alike.

In each row there were planted eight large potatoes, [a]; eight medium potatoes, [b]; eight pieces, cut, two or more eyes, [c]; and eight pieces cut to one eye, [d]; weighed and planted one foot apart.

Below is a table giving weight of potatoes and cuttings planted; [a], weight of eight large potatoes; [b], weight of eight medium potatoes; [c], weight of eight cuttings, two or more eyes, and [d] weight of eight cuttings, one eye.

Name of Variety.	Weight of 8 large potatoes planted.	Weight of 8 medium potatoes planted.	Weight of 8 cuttings, 2 or more eyes planted.	Weight of 8 cuttings, 1 eye planted.
	"A"	"B"	"C"	"D"
	pounds.	pounds.	pounds.	pounds.
Early Rose	2 1-2	1	1-2	1-7
Boston Peerless	3 1-2	1 1-4	3 4	1-5
Beauty of Hebron	2 1-4	1	1-2	1-8
Rural Blush	2 1-2	1 1 4	1-2	1-10
Extra Early Vermont	3 1-4	1 1-4	1-4	1-8
Russett	2 1-4	....	1-4	1-8
Burbank	2	1 1-4	1-4	1-7

Following is a table giving results:

TABLE II.—GIVING YIELD PER ACRE OF SERIES 2—PHYSIOLOGICAL EXPERIMENTS.

Name of Variety.	"A"			"B"			"C"			"D"		
	Merchantable, bushels.	Culls, bushels.	Total number bushels.	Merchantable, bushels.	Culls, bushels.	Total number bushels.	Merchantable, bushels.	Culls, bushels	Total number bushels	Merchantable, bushels	Culls, bushels	Total number bushels.
Early Rose	47	22	69	46	24	70	45	23	68	32	8	40
Boston Peerless	56	20	76	58	23	81	59	23	82	40	10	50
Beauty of Hebron	49	23	72	49	21	70	49	24	73	42	5	47
Rural Blush	53	19	72	54	20	74	51	21	72	39	7	46
Extra Early Vermont	50	24	74	51	23	74	47	22	69	34	10	44
Dakota Red	48	23	71	48	24	72	44	26	70	31	12	43
Burbank	43	24	67	42	25	67	38	27	65	30	7	37
Total	346	155	501	348	160	508	333	166	499	248	59	307
Average	49.	22.	72.	49.	23.	72.	47.	23.	71.	35.	8.	44

CONCLUSIONS.

The productive results obtained, concur with those of previous years; the larger the seed planted the greater the yield. The economical results are, however, different, and calculating for this point, results suggest that, planting on a large scale it is better to cut not to more than four eyes nor less than two.

THIRD SERIES—FERTILIZERS.

To test fertilizers best suited to potatoes in this soil. The land is essentially the same as that occupied by varieties, and had previously grown three crops of Irish potatoes. Following is a table giving results:

TABLE III—YIELD PER ACRE OF FERTILIZER TEST ON IRISH POTATOES.

Number of Experiment.	Kind and Quantity Fertilizer Used per Acre.	Merchantable, Number of Bushels.	Culls, Number of Bushels.	Total Yield, Number of Bushels.
1	252 pounds nitrate soda 168 pounds sulphate ammonia 504 pounds cotton seed meal 420 pounds acid phosphate 336 pounds kainite	63.	15.4	78.4
2	252 pounds nitrate soda 168 pounds sulphate ammonia 504 pounds cotton seed meal 420 pounds acid phosphate	63.	21.	84.
3	No manure	18.2	16.8	35.
4	252 pounds nitrate soda 168 pounds sulphate ammonia 504 pounds cotton seed meal	56.	6.4	62.4
5	504 pound acid phosphate	30.	14.4	44.4
6	1512 pounds cotton seed meal 420 pounds acid phosphate 336 pounds kainite	50.4	9.6	60.
7	1512 pounds cotton seed meal 420 pounds acid phosphate	39.8	18.6	59.4
8	1512 pounds cotton seed meal 4 pounds kainite	66.3	25.2	91.5
9	1512 pounds cotton seed meal	78.4	12.6	91.
10	No manure	15.4	16.8	32.2
11	336 pounds kainite	15.4	19.6	35.
12	5040 pounds crushed cotton seed 504 pounds acid phosphate 336 pounds kainite	55.	26.8	81.9
13	5040 pounds crushed cotton seed 504 pounds acid phosphate	58.8	21.	79.8
14	5040 pounds crushed cotton seed	54.6	15.4	70.
15	No manure	12.6	9.6	22.2
16	5040 pounds crushed cotton seed 336 pounds kainite	58.8	15.4	74.2
17	5040 pounds green cotton seed 504 pounds acid phosphate 336 pounds kainite	57.6	14.	71.6
18	5040 pounds green cotton seed 504 pounds acid phosphate	78.4	15.4	93.8
19	No manure	12.6	12.6	25.2
20	5040 pounds green cotton seed	51.6	22 4	74.
21	5040 pounds green cotton seed 336 pounds kainite	51.6	18.2	69.8

CONCLUSIONS.

Potash is a little better than no manure, phosphoric acid better than potash, neither of marked benefit used alone, even with potatoes on this soil. Green cotton seed and acid phosphate gave best results. Any form of nitrogen gives good results

combined with acid phosphate and kainite, or alone. Best results come from a combination of cotton seed, crushed and green, and cotton seed meal. Previous years bear out the statement. The largest yield, three years ago, came from acid phosphate and crushed cotton seed. Two years ago best results were from acid phosphate and cotton seed meal, and the past year the largest yield belongs to acid phosphate and green cotton seed.

FOURTH SERIES—ECONOMICAL.

To determine the money value and profits of a crop of Irish Potatoes, can Irish Potatoes be raised and sold at profit in North Louisiana? One acre of ground, similar in composition to above, was selected for the experiment. From this piece of ground there were gathered and shipped to L. B. Smith & Co., Chicago, 29 sacks, containing two and one-half bushels each of merchantable potatoes. After deducting charges for freight, cartage and commissions, Mr. Smith remitted a check for $56.60 as the net proceeds of the 29 sacks, or 78 cents, net profit per bushel. It will be remembered that in Bulletin No. 4, Second Series, the profit of an acre similarly planted for the purpose was $62.88. The result of these two experiments, expressed in money terms, is, very encouraging, and the Station is proud to note the fact that "good fruit" is being borne of the effort made. Not less than 50 acres will be planted by farmers in this vicinity the coming year, and it is hoped the results may encourage them to go forward in the truck industry.

The past year could not have been worse for the potato growers, no rain having fallen after April 15; 400 pounds cotton seed meal, 200 acid phosphate and 100 kainite was the fertilizer used above.

SUGAR CANE.

The stand of cane on the Station was poor, and this together with two prolonged droughts, with which it had to contend, resulted in rather a low yield.

The following tables give the yields and analyses of the stubble and plant cane grown, together with the extraction obtained when ground—and the manner in which the cane was fertilized.

Cane—Fertilizers per Acre.	Yield per acre, tons.	Per cent. extraction	Fibre.	Analysis of the Juice.						
				Total solids.	Sucrose.	Glucose.	Glucose ratio.	Purity Coefficient.	Solids not sugar.	Albuminoids.
2d year stubble } 300 lbs. cotton seed meal.	3.96	51.69	.....	18.1	15.1	1.38	9.13	83.42	1.62	.175
1st y'r stubble } 100 lbs. acid phosphate.	8.74	64.96	9.58	17.8	14.4	1.69	11.73	80.89	1.71	.138
1. 280 lbs. acid phosphate.....	9.44	70.03		16.6	12.5	2.77	21.76	75.30	1.33	....
2. 280 lbs. potash....	10.86	69.59		17.5	14.0	1.98	14.14	80.06	1.52	....
3. 280 lbs. cotton seed meal	9.94	61.55		17.0	13.1	2.32	17.71	77.06	1.58	....
4. 80 lbs. acid phosphate..... 380 lbs. potash....	8.54	61.32		17.1	13.4	2.15	16.04	78.36	1.55	....
5. 280 lbs. acid phosphate..... 280 lbs. cotton seed meal	11.76	68.34	6.95	17.2	13.3	2.34	17.59	77.32	1.56	....
Plant Cane 6. 280 lbs. cotton seed meal ..... 280 lbs. potash....	7.49	66.86		17.1	13.0	2.37	18.23	76.02	1.73	....
7. 280 lbs. acid phosphate..... 280 lbs. cotton seed meal ..... 280 lbs. potash ...	9.05	67.96		16.5	13.0	2.14	16.46	78.78	1.36	....
8. 560 lbs. cotton seed meal ..... 560 lbs. cotton seed meal	9.91	64.69		16.8	13.0	2.49	19.15	77.38	1.31	....
9. 140 lbs. acid phosphate..... 140 lbs. potash....	13.08	71.10		17.1	13.4	2.30	17.16	78.36	1.40	....
10. No manure	8.37	68.23		17.4	14.4	2.10	14.72	82.71	.90	....

Sugar making was commenced on October 28, and the crop, with the exception of the varieties, was ground by November 4. The same process was employed as last year, which is thoroughly explained in the Bulletin isssued then entitled "Sugar Making on a Small Scale."

The following is a condensed summary of the analysis and sugar house data obtained:

	Total solids	Sucrose.	Glucose.	Glucose ratio	Purity coefficient.	Solids not Sugar.	Albuminoids.
Raw Juice	17.6	14.2	1.81	12.74	80.68	1.59	.165
Limed Juice	17.8	14.1	1.83	12.97	79.21	1.87	.077
Massecuite	.....	70.6	11.84	16.76	.....	.....	.....
Sugar	.....	79.2	7.44	9.35	.....	.....	.....
Molasses	79.2	46.55	22 41	48.14	58.77	10.24	.....

Cane ground, 15.49 tons.
Per cent extraction, 63.66.
Sugar made, 2086 pounds.
Molasses made, 140 gallons = 1638 pounds.
Sugar per ton of cane, 134.66 pounds.
Molasses per ton of cane, 9.03 gallons.

HOW CAN THE LIGHT LANDS OF NORTH LOUISIANA BE PROFITABLY FARMED?

If permanent improvement of the soil's coincident with the growing of maximum crops be desired, no better system can be adopted than the rotation with or without fertilizers described on page———

A one-horse farm in the hill lands is usually about 30 acres in size. Of this amount about 10 acres are planted in corn, the rest in cotton. The average yields under the ordinary system pursued are about 12 to 15 bushels of corn and 400 to 500 pounds seed cotton per acre with a constant yearly detereoration.

The following division of the land and system of rotation would be preferable, and in the end, far more profitable: Divide the lands into three fields of 10 acres each. In the first field, plant rust-proof oats early in October and manure them with either one of the oat fertilizers given later on. When the oats are gathered in June, plow the land well and sow it broadcast with clay or unknown peas, using the special pea fertilizer.

In the second field, plant corn early in March, using one of the corn fertilizers. Select a prolific variety and plant closer

each year of the rotation. At lay-by, plant on each side of the corn a row of cow peas.

In the third field, plant cotton early in April, using one of the cotton fertilizers.

The next year, field No. 2 goes into oats to be followed by cow peas, and field No. 3 goes into oats and cow peas and field No. 1 into cotton.

The third year, field No. 3 goes into oats and cow peas; field No. 1 into corn and cow peas, and field No. 2 into cotton. This completes the rotation, which is again repeated as before. At the end of the first complete rotation, the crops on the farm should be doubled in yield without aid from fertilizers. If fertilizers be used, as should always be done, if possible, the yield should be increased over three fold. The cow peas should be picked when ripe and the vines plowed under any time during the winter. On very stiff lands they should be turned under in the fall. Unfortunately, the cotton farmer has not yet learned the value of pea vines to his land. Besides the large amount of nitrogen they add directly to the land, they furnish a large supply of humus or vegetable matter, which enables the soils to carry successfully the crops through the drouths, which now, unhappily, come at very short intervals. This humus also aids the soil in carrying thicker and heavier crops. By this system practiced intelligently for a few years, our lands would improve: our farmers would become independent of merchants; our homes could be made attractive; more and better stock cared for, and plenty and prosperity would cast their smiles over the piney hills.

The following are the formulas for the above crops:

FOR OATS.

No. 1. { 200 pounds cotton seed meal
100 pounds acid phosphate } per acre.

No. 2. { 150 bushels cotton seed
150 bushels stable manure
1000 pounds acid phosphate } for 10 acres.

Composted as per directions.

FOR COW PEAS.

——— { 100 pounds acid phosphate / 100 pounds kainite } per acre.

FOR CORN.

No. 1. { 150 pounds cotton seed meal / 100 pounds acid phosphate } for 1 acre.

No. 2. { 120 bushels cotton seed / 120 bushels stable manure / 1000 pounds acid phosphate } for 10 acres.

Composted as directed.

FOR COTTON.

No. 1. { 100 pounds cotton seed meal / 100 pounds acid phosphate } for 1 acre.

No. 2. { 80 bushels cotton seed / 80 bushels stable manure / 1000 pounds acid phosphate } for 10 acres.

Composted as directed.

The cost of these—cotton seed meal and acid phosphate—would be about $20 per ton each, and kainite $15. If the mixtures designated as No. 1 under each crop be used, the following will be the expense under each crop for each year:

For the oat crop, 10 acres, at $3.00	$30 00
For the pea crop, 10 acres, at $1.75	17 50
For the corn crop, 10 acres, at $2.50	25 00
For the cotton crop, 10 acres, at $2.00	20 00
Total for the year	$92 50

The yields for the first year should be from 200 to 300 bushels oats, 100 to 200 bushels peas, 200 to 300 bushels corn, and 5 to 7 bales of cotton. These yields should greatly increase each succeeding year. If we value oats at 30 cents, peas at $1.00, corn at 50 cents per bushel, and cotton at 8 cents, these crops would be worth $460 to $720, independent of the peas that might be picked from the corn. If the Clay, or Unknown Pea, be raised, they can always be sold in New Orlexns to the sugar planters at much higher figures than the above. If no market be offered for surplus oats and corn, these can easily be put into

live stock at the above prices, which will always sell. Extra hogs may be fattened—a colt or two raised—a few well-bred cows or sheep may be kept. All of these will bring ready cash at any time, if kept in good order. If the compost be adopted, partly or entirely, only the acid phosphate would be purchased.

The times are propitious for a change in our mode of farming. The low price of cotton forces us to the adoption of some plan which will bring us relief. It is time to stop planting and go to farming. With those living near the railroad, the acreage in oats might be slightly reduced, and early vegetables, such as Irish potatoes, sweet potatoes, melons, etc., substituted. The rotation given above may be adopted even without fertilizers. It is hoped that the farmers will adopt this, or some similar or better plan for their future action.

DIRECTIONS FOR MAKING COMPOST.

Under shelter, spread out, an aliquot part of the stable manure to the depth of three or four inches. Sprinkled over it an aliquot part of the acid phosphate. Next spread over this a quantity of cotton seed equal to stable manure used. Before using the cotton seed, make them as wet as possible. Over the cotton seed sprinkle another portion of acid phosphate. Continue this rotation until all the ingredients are consumed, and then cover the top with rich earth from the fence corners, five or six inches deep. Let the mass remain until ready for use (four to six weeks will suffice) and cut vertically down with a mattock or hoe. Mix well and apply broadcast for oats—in the hill for corn, and in the drill for cotton. Be careful to wet the cotton seed thoroughly and buy only a first-class acid phosphate.