1893

Report of results for 1892 at Calhoun, La.

Jordon G. Lee

SECOND SERIES,

No. 21.

BULLETIN

OF THE

NORTH LOUISIANA EXPERIMENT STATION,

WM. C. STUBBS, Ph. D., Director.

REPORT OF RESULTS FOR 1892,

AT

CALHOUN, LA.,

BY

J. G. LEE, ASSITANT DIRECTOR.

ISSUED BY THE BUREAU OF AGRICULTURE.

H. C. NEWSOM, Commissioner.

BATON ROUGE, LA.
PRINTED AT THE TRUTH BOOK AND JOB OFFICE.
1893.

LOUISIANA STATE UNIVERSITY AND A. & M. COLLEGE.

BUREAU OF AGRICULTURE.

GOV. MURPHY J. FOSTER, President.
WM. GARIG, Vice-President Board of Supervisors.
H. C. NEWSOM, Commissioner of Agriculture.

STATION STAFF.

WM. C. STUBBS, Ph. D., Director.
T. P. HUTCHINSON, Assistant Director, Audubon Park, New Orleans, La.
D. N. BARROW, B. S., Assistant Director, Baton Rouge, La.
J. G. LEE, B. S., Assistant Director, Calhoun, La.
ADOLPH LEHMANN, B. S. A., Chemist, Audubon Park, New Orleans, La.
J. T. CRAWLEY, A. M., Chemist, Audubon Park, New Orleans, La.
R. T. BURWELL, M. E., Machinist, Audubon Park, New Orleans, La.
B. B. ROSS, M. S., Chemist, Baton Rouge, La.
R. E. BLOUIN, B. S., Assistant Chemist, Baton Rouge, La.
A. T. PRESCOTT, M. A., Botanist, Baton Rouge, La.
H. A. MORGAN, B. S. A., Entomologist, Baton Rouge, La.
F. H. BURNETTE, Horticulturist, Baton Rouge, La.
W. H. DALRYMPLE, M. R. C. V. S., Veterinarian, Baton Rouge, La.
M. BIRD, B. S., Chemist, Calhoun, La.
J. N. ROUSSEL, Sugar Maker, Audubon Park, New Orleans, La.
E. G. CLARKE, Farm Manager, Audubon Park, New Orleans, La.
W. B. MERCIER, B. Sc., Farm Manager, Baton Rouge, La.
IVY WATSON, Farm Manager, Calhoun, La.
H. SKOLFIELD, Treasurer, Baton Rouge, La.
F. E. CLARK, Stenographer and Secretary, Audubon Park, La.

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

LOUISIANA STATE UNIVERSITY AND A. AND M. COLLEGE,
Baton Rouge, Louisiana, February 1, 1893.

Mr. H. C. Newsom, Commissioner of Agriculture, Baton Rouge, La.:

Dear Sir—I hand you herewith Report of the North Louisiana Experiment Station, at Calhoun, La., and ask that it be published as Bulletin No. 21.

Respectfully submitted,

WM. C. STUBBS, Director.

NORTH LOUISIANA EXPERIMENT STATION,
Calhoun, La., December, 1892.

To W. C. Stubbs, Ph. D., Director:

Dear Sir—I herewith hand you annual report of the results of all crops harvested at this Station during the past year, not previously reported; also report of Mr. E. G. Watson on fruits; that on vegetables will be published later. I trust the publication may be interesting and profitable to the farmers of the State.

Respectfully,

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

REPORT.

REVIEW OF THE YEAR.

The weather during the early part of the year was unfavorable to farm work and plant growth, due to a late, cold, wet spring. The after season, however, was all that could be desired for all crops, except cotton. The excessive rains of summer reduced the yield of cotton nearly one half, compared to the crop of 1891.

THE ORCHARD.

Sixty-two varieties of fruits have been added to those given in Bulletins Nos. 8 and 16, Second Series, constituting the orchard of 1892.

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

Peaches—(14 varieties)—Ringold (c), * Lonoke (c), Gardeners' June (c), Maggie (c), Hughes' I X L (c), Levy Cling (c), Jessie Kerr (c), Vance's White Cling (c), Secnarf (c), Campbell (c), Kolo (c), Kalvola (f), * Mourie Ross (f), Boker's Early (c).

Apples (eleven varieties)—Ever-bearing (s),† Golden Pippin (s), Wealthy (s), English Golden Russett (s), Striped June (s), Beitheimer (s), Early Ripe (s), Fall Wine (w), Talbot's Pippin (w), Stark (w), Haas or Fall Queen (w).

Pears (two varieties)—Bordeaux, Guy Lewis.

Persimmons (two varieties)—Zedo, Tusara.

Grapes (two varieties)—Diana, Montgomery.

The above were obtained from Mr. L. G. Sanders, of Plain Dealing, Bossier parish, La.

---

* c, means clingstone; f, freestone.
† s, means summer; w, winter.

The following varieties of Grapes were obtained from the Horticultural Department at Baton Rouge:

Amber, Beagle, Brilliant, Bacchus, Clinton, Elvira, Etta, Diamond, Early Market, Dracutt Amber, Green's Golden Eaton, Hartford, Hebermont, Catawba, Progress, Jefferson, Noah, Worden's Niagara, Moore's Early, Mrs. Munson, Martha, Perkins, Montefoire, Pres. Lyon, Peter Wylie, Pockington, Ives, Zinfondel.

Notwithstanding the severe frosts of March and April, the following varieties of fruit were obtained and remarked on:

REMARKS ON PEACHES.

VARIETIES.

Alexander—First blooms, March 21; first ripe fruit, June 6; medium size; round; skin red; flesh cream-white, very soft and juicy; sub-acid; tree moderately vigorous, hardy and productive.

Early Beatrice—First bloom, March 25; first ripe fruit, June 15; crop somewhat injured by late frost, but set a fair crop; fruit small; round; dark red; moderately good flavor; tree hardy and productive.

Early Louise—Ripe June 17; medium to small; round; white with red cheek; flesh greenish white; sub-acid; tree hardy and vigorous, productive; freestone.

Early Rivers—First bloom, March 25; first ripe fruit June 19; medium large; round; skin cream-white, splotched with red; flesh cream white, juicy, rich, sweet; tree hardy, vigorous, prolific; fruit seems inclined to rot, but not badly.

Early Hale—Ripe June 22; medium size; nearly round; greenish, splotched with red; flesh white, melting juicy; sub-acid; tree hardy and vigorous; crop somewhat injured by late frost rotted badly; freestone.

Early Crawford—Ripe July 1; large; round; skin yellowish red; flesh yellow, sweet, juicy, excellent; bore only a few speci-

mens; surface somewhat uneven, with long protuding apex; tree is lacking to some extent in both hardiness and vigor; freestone.

Amelia—Ripe July 8; medium to large; inclined to oblong; skin mostly white, with splotches of red; surface uneven; flavor moderately good; tree healthy and vigorous; freestone; crop almost entirely destroyed by late freeze.

Pallas—Ripe July 9; the annual report of this Station for 1890 gives a note on this peach; the crop of 1891 was destroyed by late freezes, and this year (1892) it was so badly injured that a fair sample could not be obtained; freestone.

Newington—Ripe July 12; medium to large; nearly round; skin white tinged with red; flesh cream-white, solid, juicy, sweet; tree comparatively hardy and vigorous; crop almost entirely destroyed by late frost; clingstone.

Thurber—Ripe July 14; medium to small; inclined oblong; white, splotched with red; flesh cream-white, crimson at seed, comparatively good quality; crop almost destroyed by late frost; tree very hardy and vigorous; freestone.

Oriole—Ripe July 15; medium to large; oblong to round; rich, yellow, shaded with red; flesh yellow, firm, juicy, sweet, excellent; tree a hardy, stout grower; a good bearer; splendid for drying purposes; clingstone.

Stump the World—Ripe July 15; a fair sample of this peach could not be obtained; only a few specimens escaped the late frost; medium to large; sutured; round, skin deep yellow; flesh yellow; comparatively good quality; tree hardy and vigorous; freestone.

Old Mixon Cling—Ripe July 18; medium size, round; skin white, with red cheek; flesh cream-white, sweet, juicy, melting; crop almost entirely destroyed by late frost; tree comparatively hardy and vigorous; clingstone.

Gen. Lee (Clingstone)—Ripe July 18; large; inclined to oblong; skin white, tinged with red; flesh cream-white, marbled with red; quality comparatively good; tree a moderate but hardy grower; bore a light crop.

Sylphide Cling—Ripe July 21; medium to large; round; slightly sutured; skin white, splotched with red; flesh cream-white; crimson around seed; juicy, sweet, excellent; tree very hardy, but only moderately vigorous; a fair crop.

Crawford's Late.—Medium to large, round; deep yellow, with dark red cheek, flesh orange yellow; juicy, melting, rich, excellent; tree comparatively vigorous and hardy; crop almost entirely destroyed by late frost; freestone; ripe July 23.

Pineapple—Ripe July 24; medium size; round; sutured; elongated apex; skin rich yellow, with dull red cheek; flesh yellow; solid, juicy, acid; crop almost entirely destroyed by late frost; tree comparatively hardy and vigorous, clingstone.

Juno (Clingstone)—Ripe August 2; medium to large; round; skin yellow, intermingled with red; flesh deep yellow; juicy, sweet, firm and solid; owing to excessive rains during summer it rotted badly; tree vigorous and hardy; bore a light crop.

Picquett's Late—Ripe August 6; medium to large; round; deep yellow; flesh yellow; very sweet and juicy; tree moderately vigorous and hardy; crop almost entirely destroyed by late frost; freestone.

Osceola—Ripe August 10; medium size; round; skin green-yellow, splotched with dull red; flesh yellow, juicy, acid; tree hardy and productive; freestone.

Stonewall Jackson (Clingstone)—Very large; round; skin white, tinged with red; flesh cream white, marbled with crimson; sweet, juicy, excellent; tree hardy and vigorous; light bearer.

Indian Blood—Crop almost destroyed by late frost; what was left never matured; tree seems to be lacking in both hardiness and vigor.

Heath's Late—Ripe August 25; medium to large; round; skin white, with red cheek; juicy, rich, sweet; tree badly infected with borers; crop almost entirely destroyed by late frost; clingstone.

Tinsley's October—Ripe Sept. 15; medium size; round; white, splotched with dull red; flesh white, hard and dry; never ripened thoroughly; very poor quality; a full crop; tree hardy and vigorous; clingstone.

Darby's Cling—Ripe September 22; medium size; round; creamy white; flesh hard and solid; ripens very slowly; tree moderately vigorous, very productive; a full crop.

Cora—Ripe September 28; medium to small; round; skin cream-white, splotched with dull red; flesh white with crimson at seed, juicy, melting, sub-acid; crop partly killed by late frost; tree moderately vigorous; freestone.

RECOMMENDATIONS.

General Jackson, Oriole, General Lee, Early Rivers, Alexander, Newington, Old Mixon Cling; Sylphide Cling; Picquett's Late, Early Crawford, Stump of the World and Pineapple are all good peaches and adapted to this soil and climate and are recommended in the order named.

REMARKS ON PLUMS.

VARIETIES.

Marianna—Ripe June 1; fruit medium size; oblong shaped; dark red; flesh dry and coarse; poor flavor; tree exceedingly hardy and vigorous, dense compact grower; a very light crop.

De Caradene—Ripe June 8; medium to large; round; skin dark red, very tender and soft; very susceptible to the ravages of the curculio; flavor comparatively good; tree a very healthy vigorous, upright grower, requires but little pruning to form a most superb symmetrically shaped tree; crop badly injured by the late frost.

Robinson's—Ripe June 20; medium size; round; rather sour; tree hardy and prolific; slow to ripen.

Newman's—Ripe June 26; medium size, inclined oblong; light red; flesh rather dry and coarse; poor flavor; tree hardy and productive; freestone.

Pottawattamie—Ripe July 9; a small, conical-shaped plum; moderately good quality; tree very hardy, but not vigorous; a great bearer.

Cumberland.—Ripe July 10; medium size; oval shaped; skin light yellow, with orange yellow; flesh peculiar acid flavor; tree hardy, vigorous and handsome; very prolific; badly inclined to rot; clingstone.

Miner's—Ripe July 25; medium size; oblong, round; dark red; flesh yellow; juicy, sweet and firm; skin very thick and tough; appears to be entirely free from the ravages of the curculio; a splendid shipper; enormously productive; the fruit is formed in most artistically arranged clusters along the branches, presenting a most beautiful appearance; clingstone.

Kanawha—Ripe July 27; medium to small; round; skin bright red; with yellow flesh; acid flavor; ripens very slowly and keeps a long time; skin tough and thick; entirely free from insects; hardy, prolific.

Mâsu—(Japan)—Tree a hardy, vigorous, symmetrical grower; only about a dozen specimens escaped the frost in April; developed well; at the June meeting of the North Louisiana Agricultural Society, just as the fruit had begun ripening, they were all taken by unknown parties.

REMARKS ON NECTARINES.

Early Violet—Ripe July 8; medium to small; round; pale green, splotched with violet; flesh whitish, melting juicy, highly flavored; tree hardy and vigorous; productive, badly affected with worms; freestones.

Duc de Tellier—Ripe July 12; medium size; round; scarlet red, mottled with greenish yellow; acid flavor; flesh cream-white, firm and solid; tree hardy and vigorous; very light crop.

New White—Ripe July 13; medium to small; round; white; with greenish splotches; flesh whitish, acid flavor; tree lacking in both health and vigor; a very light crop; freestone.

Golden Cling—Ripe July 12; tree is not vigorous or healthy; bore only about a half dozen specimens; medium to small size; round; orange yellow; firm and solid; comparatively good flavor.

Boston—Ripe July 9; medium to small; round; bright yellow, splotched with greenish red; juicy, firm, acid flavor; tree very vigorous and healthy; a good bearer; freestone.

Coosa—Ripe July 10; medium size; round; scarlet red; cream white; flesh sweet, juicy, firm; tree hardy and vigorous; bore only a few specimens.

REMARKS ON JAPAN PERSIMMONS.

Minokaki—Ripe December 4; medium size; oblong shape; orange yellow; rather coarse and stringy; moderately astringent; tree hardy and vigorous; bore only a few specimens.

Costata—Ripe December 1; medium size; round; deep yellow; rather coarse and dry; more astringent than Minokaki.

Hacheya—Ripe December 18; medium size; round; about the same in quality as Costata.

REMARKS ON FIGS.

Celestial—Ripe August 22d; medium; pyriform-shape; brownish red; excellent flavor; tree very vigorous; very light producer.

Brown Turkey—Ripe August 26; medium to large; pyriform; brown-red, very luscious; prolific.

Green Ischia—Ripe October 3; medium to large; turbinate; skin light green; deep crimson; exceedingly luscious; moderately prolific.

White Marseilles—Ripe September 21; large size; pyriform; dark purple; skin thick and tough; flesh light crimson: rather coarse, but luscious; moderately prolific.

Brunswick—To all appearances identical in every respect to White Marseilles.

Angelique—Ripe October 16; small size obovate; cream-yellow; very luscious; moderately prolific.

REMARKS ON APPLES.

The following varieties bore this year, but only one or two matured. The trees are yet too young for a crop:

Early Harvest, Carolina Watson, Rhodes' Orange, Kittageskie, Romanite, Black Warrior.

The Black Apricot has proven conclusively to be the most hardy and vigorous of 15 varieties planted, nearly all of which are now dead. Bore only a few specimens. They were large, dark red with well ripened yellow flesh and an excellent flavor.

The Augers Quince, ripe October 22, was medium large; greenish yellow; acid flavor; uneven surface; sutured, firm; very dry; good for preserving; tree hardy.

One dwarf pear, Dr. Jules Guyot, received from the nursery of P. J. Berckmans, Augusta, Ga., in December and planted same month, bore and matured fruit the following summer, small pyramidal, dull yellow, spendid flavor, ripe October 20. The severe frosts destroyed all other pears and fruits.

LIVE STOCK.

CATTLE.

The Holsteins, Jerseys, Guernseys and Devons, previously described, are still retained at the Station, the Holstein cow

"Rubena," and the Jersey, "Beautiful Princess," maintained their previously published records. Owing to the bad condition in which the Guernsey cow, "Thornless," and the Devon, "Red Rose Fan," were received, no records have been made. The Guernsey cow has just dropped a beautiful heifer calf and the fine young Jersey heifer, "Lizzie Stubbs," has also a splendid heifer calf. The surplus is disposed of as fast as desirable to the farmers of the State. From these four breeds of cattle it is believed that North Louisiana can find one or more adopted to its wants.

SHEEP AND HOGS.

The same breeds of sheep and hogs are at the Station as reported in Bulletin 16, Second Series.

The offspring are taken at once at the schedule prices, in fact there is more demand for sheep and hogs, especially the latter, than the Station can possibly supply, indicating that the farmers are looking more energetically to improved breeds and home production of meat.

POULTRY.

A record was kept of the eggs laid by the several breeds of hens from January to August, 1892, 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	1	72	72	European origin.
Minorcas	3	127	43	European origin.
Houdan	1	24	24	European origin.
Silver Spangled Hamburg	1	37	37	European origin.
Langshan	3	147	49	Asiatic origin.
Light Brahmas	2	116	58	Asiatic origin.
Partridge Cochin	1	27	27	Asiatic origin.
Buff Cochin	2	92	46	Asiatic origin.
Barred Plymouth Rock	1	46	46	American origin.
*Houdan Minorca	1	45	45	American origin.
Bronze Turkey	1	27	27	American origin.

*A cross of Houdan and Minorca by the Station.

The Bronze Leghorn have given the best record now for three successive years. They are followed by Light Brahma and Langshan and Plymouth Rock, Buff Cochin and Minorca. The European are the best spring and summer layers but 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, and close to them are the Plymouth Rock, Wyandotts and Light Brahmas. However, it is hard to decide the merits of a fowl confined to close pens and fed only vegetable foods raised upon the farm.

PRICES OF LIVE STOCK.

At the request of the Station the North Louisiana Agricultural Society has placed the following tariff of prices to govern all sales:

A bull calf of any breed	$ 50 00–$ 75 00
A heifer calf of any breed	75 00– 125 00
A buck or ewe of any breed	5 00– 7 50

Grade buck or ewe of any breed	$ 3 00 - $ 5 00
Chickens—single	1 50
Chickens—pair	2 50
Chickens—trio	3 00
Chickens—eggs, per setting	1 00
Service of bulls	2 00
Service of bucks	1 00
Service of boar	1 00

FIELD EXPERIMENTS.

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 proper rotation of crops with or without fertilizers. What crops shall be selected for this rotation? Any combination which omits our cow pea would be injudicious. Several years ago the following rotation was decided upon as the best rotation attainable in this section: This rotation is corn, oats, followed by cow peas and 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 metathesis of crops. This rotation was adopted with and without fertilizer. It was begun in 1889. Three parallel strips, one-half acre wide and two acres long, were selected for the experiments. The eastern half of each is manured regularly with a fertilizer adopted to the crop, while the western half remains without fertilizer. The following is the condensed results of four years:

Name of plot.	How Treated.	1889.	1890.	1891.	1892.
"A"	Fertilized half.	12 bushels oats. 8 45 tons peavines.	28 bushels corn.	55.2 bushels oats, 1360 lbs. straw, 8 10 tons peavines and 4.6 bus. peas.	1558 pounds of cotton.
	Unfertilized half.	7½ bushels oats. 4.22 tons peavines.	20.6 bushels corn.	25.5 bushels oats, 816 lbs straw, 2.4 tons peavines and 1.5 bus. peas.	331 pounds of cotton.
"B"	Fertilized half.	829 lbs. cotton.	24½ bushels oats, 1020 lbs straw, 10.2 tons peavines.	1719 lbs cotton.	34.3 bushels of corn.
	Unfertilized half.	528 lbs cotton.	8⅜ bushels oats, 710 lbs. straw, 5 6 tons peavines	620 lbs cotton	14.6 bushels of corn.
"C"	Fertilized half.	17.73 bushels corn.	768 pounds cotton.	16.8 bus. corn.	47.8 bushels of oats.
	Unfertilized half.	13 69 bushels corn.	429 pounds cotton.	4 8 bus. corn	22.5 bushels of oats.

The fertilizers used under each crop is given at end of report for 1891, with directions how to make the compost. These experiments will be continued for several years in order to determine, first, the renovating influence of such a rotation without the use of fertilizers; second, the increased influence of same rotation, each crop fertilized. The extreme drought of 1891 interfered with the yields of corn and oats, and excessive rains of past year injured the cotton. However, the results show marked improvements, particularly in the fertilized rotation. The earlier maturity of the fertilized crops, especially cotton, is distinctly marked every year.

COTTON.

Experiments in cotton were of three kinds: 1st. Manurial tests, embracing nitrogenous, phosphatic and potassic fertilizers, and proper depths and time and number of applications of each. 2d. Varieties best adapted to this soil. 3d. Distances to be given to secure the largest profit. Plot No. 1 was devoted to nitrogenous manure. The questions propounded to this plot are:

1st. Does this soil need nitrogen to grow cotton profitably?
2d. If so, in what form can it be best presented?
3d. In what quantities per acre?

In the plot nitrate soda and sulphate ammonia (mineral forms) have been tested with cotton seed meal and cotton seed (raw 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 or "single" ration, and where 48 pounds are used, as two or "double" ration. There are six groups of four experiments each, viz:

1st, the nitrogenous fertilizers alone; 2d, "Mixed minerals" (acid phosphate and kainite), without nitrogen; 3d, 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 results in percentages 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 plot uniform, results could be expressed in pounds instead of percentages; but it is very irregular, as results will show.

PREPARATION AND CULTIVATION OF PLOT.

Land thoroughly and deeply broken to a depth of about 8 to 9 inches in January with the Hervey two-horse turning plow. April 21, rows were marked 3½ feet apart with straight shovel and bedded on. April 27, bed opened, fertilizer applied in drill, plow run in drill to incorporate fertilizer with soil well. Eureka (Long staple) cotton seed sowed and covered with harrow.

The after cultivation was given with hoe, side harrow, cultivator, scooter and straight shovel with heelscrape attached, cultivation all shallow. Below are the results in pickings per acre. Owing to late planting in spring, due to wet unfavorable weather, and the excessive rains of summer the yield is less than half what it was last year.

PLOT NO. 1—COTTON—NITROGEN EXPERIMENTS.

No. of Experiment.	Kind and quantity of manure used per acre.	First picking, September 27th.	Second picking, October 19th.	Third picking, November 17th.	Yield per acre seed cotton, pounds.
1	160 lbs. *nitrate soda*	520	170	180	870
*2	240 lbs. *mixed minerals*	270	150	120	540
3	160 lbs. *nitrate soda* 230 lbs. *mixed minerals*	480	240	280	1000
4	320 lbs. *nitrate soda* 240 lbs. *mixed minerals*	330	370	400	1100
5	12 lbs. *sulphate ammonia*	360	200	220	780
6	240 lbs. *mixed minerals*	260	150	140	550
7	240 lbs. *mixed minerals* 120 lbs. *sulphate ammonia*	500	160	200	860
8	240 lbs. *mixed minerals* 240 lbs. *sulphate ammonia*	46	130	240	830
9	No manure	180	80	120	380
10	200 lbs. *dried blood*	220	220	120	560
11	240 lbs *mixed minerals*	300	70	100	470
12	240 lbs. *mixed minerals* 200 lbs *dried blood*	420	100	120	640
13	240 lbs. *mixed minerals* 400 lbs. *dried blood*	600	150	140	890
14	360 lbs. *fish scrap*	390	120	90	600
15	240 lbs. *mixed minerals*	220	60	80	360
16	240 lbs. *mixed minerals* 360 lbs. *fish scrap*	480	90	90	660
17	240 lbs. *mixed minerals* 720 lbs. *fish scrap*	700	140	170	1010
18	360 lbs. *cotton seed meal*	220	190	140	550
19	240 lbs. *mixed minerals*	140	50	110	300
20	No manure	18	60	80	320
21	240 lbs. *mixed minerals* 360 lbs. *cotton seed meal*	260	110	160	530
22	240 lbs. *mixed minerals* 720 lbs. *cotton seed meal*	200	180	190	570
23	1040 lbs. *crushed cotton seed*	360	100	100	560
24	240 lbs. *mixed minerals*	260	60	80	300
25	240 lbs. *mixed minerals* 1040 lbs. *crushed cotton seed*	280	120	150	550
26	240 lbs. *mixed minerals* 2080 lbs. *crushed cotton seed*	240	170	170	580
27	1040 lbs. *rotted cotton seed*	360	100	110	570
28	240 lbs. *mixed minerals*	220	70	60	350
29	No manure	160	70	90	320
30	240 lbs. *mixed minerals* 1040 lbs. *rotted cotton seed*	440	100	120	660
31	240 lbs. *mixed minerals* 2080 lbs *rotted cotton seed*	380	90	100	570
32	4200 lbs. *compost*	700	120	90	910
33	240 lbs. *mixed minerals*	250	70	80	400
34	4200 lbs. *compost* 80 lbs. *kainite*	640	130	80	850
35	8400 lbs. *compost* 80 lbs. *kainite*	670	120	70	860

*Four pounds of acid phosphate and two pounds of kainite.

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 where no manure manure was used is 340 pounds per acre. The average of nitrogen alone is 627 pounds, showing a gain due to nitrogen of 287 pounds per acre The average of the experiments with mixed minerals is 398 pounds. The average of one ration of nitrogen (24 pounds) combined with mixed mineral is 700 pounds, while that of two rations (48 pounds) is 793 pounds, showing an excess due to one ration of nitrogen of 302 pounds, and to two rations 395, 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 soda, uncombined and combined, over its mixed minerals are, respectively, 330, 460, 560, or 61, 85, 103 per cent. The excesses of sulphate ammonia, uncombined and combined, over its minerals are, respectively, 230, 310, 280 pounds, or 41, 56 and 50 per cent. The excesses of dried blood over its mixed minerals are respectively 90, 170 and 420, or 2, 36 and 89 per cent. The excesses of fish scrap are likewise, 240, 360, 650 pounds, or 66, 83 and 180 per cent. over its mixed minerals. Likewise, the excesses of cotton seed meal are, respectively, 250, 230 and 270 pounds, or 83, 77 and 90 per cent. over its mixed minerals. Likewise, excesses cerushed cotton seed are respectively, 260, 250 and 280 pounds, or 87, 83 and 93 per cent. over its mixed minerals, while rotten cotton seed excesses are 220, 310 and 220 pounds, or 63, 83 and 63 per cent. over the yields of its mixed minerals.

The average per cent. of increase due to nitrate soda is 83, of sulphate of ammonia 49, dried blood, 49, fish scrap, 107, cotton seed meal 80, crushed cotton seed 87 and of rotten cotton seed 71 per cent. Fish scrap is ahead, followed closely by cotton seed meal, crushed cotton seed and nitrate soda. But the average of the two *mineral* forms of nitrogen, nitrate soda and sulphate ammonia, is 66 per cent., of the two *animal* forms, dried blood and fish scrap, it is 78 per cent., and of the three *vegetable*

forms, cotton seed meal, crushed and rotten cotton seed, it is 82 per cent.

These results declare in favor of the *vegetable* forms of nitrogen, followed closely by the *animal* forms. Heretofore the mineral forms have given slightly best results. But the very wet year, the mineral forms being soluble, rendered short duration to its availability. But while cotton produces well with any form of nitrogen, the vegetable forms are preferred, because they are most 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 and 24 pounds of nitrogen (the amount of each ration) at 19½ cents or $4.70 per acre, by calculation there are losses with the double ration in five cases and profit in only two. Concurrent results of four years now, strongly indicate that on these soils one ration, or 24 pounds, of ditrogen per acre, is more profitable than larger quantities.

The above experiments were planted at the same time and attention is called to the dates and the results of the pickings.

PLOT 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 phosphate or dissolved bone must contain a large quantity of gypsum (land plaster), there has been used in two experiments gypsum only, to see how far the results from experiments with acid phosphate or dissolved bone are due to the presence of this substance. In this plot the same questions are propounded with phosphoric acid manures, as are propounded with nitrogen in Plot 1, viz:

1st. 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?

Preparation, cultivation, etc., essentially the same as in Plot No. 1.

Following are the results:

PLOT NO. 2—COTTON—PHOSPHATE EXPERIMENTS.

Number of Experiment	Kind and quantity of manure used, per acre.	First picking, Sept. 27.	Second picking, Oct. 14.	Third picking Nov. 18	Yield per acre of seed cotton—pounds.
1	80 pounds gypsum	400	210	120	730
2	160 pounds dissolved bone black	510	180	130	820
3	480 pounds cotton seed meal 120 pounds kainite (Equal to basal mixture)	200	250	260	710
4	600 pounds basal mixture 100 pounds dissolved bone black	280	370	280	930
5	600 pounds basal mixture 330 pounds dissolved bone black	320	310	280	910
6	80 pounds gypsum	390	190	180	760
7	160 pounds acid phosphate	450	170	160	780
8	600 pounds basal mixture	520	220	180	920
9	No manure	360	80	80	520
10	600 pounds basal mixture 160 pounds acid phosphate	280	230	150	660
11	600 pounds basal mixture 320 pounds acid phosphate	290	230	180	700
12	160 pounds bone meal	330	180	80	590
13	600 pounds basal mixture	360	180	120	660
14	600 pounds basal mixture 160 pounds bone meal	400	200	140	740
15	600 pounds basal mixture 320 pounds bone meal	380	180	100	660
16	160 pounds South Carolina floats	290	90	80	460
17	600 pounds basal mixture	380	120	60	560
18	600 pounds basal mixture 160 pounds South Carolina floats	490	140	80	710
19	600 pounds basal mixture 320 pounds South Carolina floats	410	130	80	650
20	No manure	220	110	50	380
21	160 pounds Thomas slag	220	80	60	360
22	600 pounds basal mixture	460	100	60	620
23	160 pounds Thomas slag 600 pounds basal mixture	340	100	80	520
24	320 pounds Thomas slag 700 pounds basal mixture	280	110	60	450
25	No manure	280	80	60	420

730
520
380
420
4 10 5
5 1 2

CONCLUSIONS.

"Does this soil need phosphoric acid to grow cotton profitably?" is not answered as strongly in the affirmative as it has done in the past three years. The average increase of uncombined phosphates over no manure is 102 pounds, and combined with basal mixture (cotton seed meal and kainite) it gives no increase over the latter. "What form is best to present?" is answered emphatically in favor of the soluble forms, dissolved bone black and acid phosphate. The third question, "What quantity per acre?" is emphatically for the single ration, there being a money loss in every instance with the double ration. Phosphoric acid is needed to grow cotton profitably, but not like nitrogen.

PLOT NO 3.—COTTON—POTASH EXPERIMENTS.

In this plot 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 Plot No. 1, viz :

1st. Does this soil need potash to grow cotton profitably?

2d. If so, in what form can it be best presented?

3d. In what quantity per acre?

Preparation and cultivation same as Plot No. 1.

Plat planted in Kennith long staple cotton.

Following are the results :

PLOT NO. 3—COTTON—POTASH EXPERIMENTS.

No. of Experiment.	Kind and Quantity Manure Used per Acre.	First picking, Sept. 27.	Second picking, Oct 14	Third picking, Nov. 18.	Yield per acre of seed cotton, pounds.
1	240 lbs. cotton seed hull ashes	220	80	60	360
2	360 lbs. cotton seed meal 240 lbs. cotton seed hull ashes	360	100	60	520
3	360 lbs cotton seed meal 480 lbs cotton seed hull ashes	340	100	80	620
4	120 lbs. cotton seed hull ashes	280	110	10	400
5	480 lbs. cotton seed meal 240 lbs. acid phosphate } meal phosphate	370	120	100	590
6	720 lbs. meal phosphate 120 lbs. cotton seed hull ashes	420	110	110	640
7	720 lbs. meal phosphate 240 lbs. cotton seed hull ashes	280	120	100	500
8	No manure	200	90	80	370
9	160 lbs. kainite	210	80	70	360
10	720 lbs. meal phosphate	260	140	120	520
11	720 lbs meal phosphate 160 lbs. kainite	310	140	90	540
12	720 lbs. meal phosphate 320 lbs kainite	260	110	130	500
13	40 lbs. muriate potash	220	110	110	440
14	720 lbs. meal phosphate	280	14	120	540
15	720 lbs. meal phosphate 40 lbs. muriate potash	280	90	100	480
16	720 lbs. meal phosphate 80 lbs muriate potash	240	80	100	420
17	No manure	280	90	70	440
18	60 lbs. sulphate potash	250	80	100	430
19	720 lbs. meal phosphate	380	130	140	650
20	960 lbs meal phosphate 60 lbs sulphate potash	250	160	130	540
21	720 lbs. meal phosphate 120 lbs. sulphate potash	280	140	130	550

CONCLUSIONS.

The average of "no manures" is 405 pounds, while the average of potash manures is 398, showing a loss to potash of seven pounds. Combined with meal phosphate (cotton seed meal and acid phosphate) it gives a loss of 57 pounds of latter. The results declare the soil not in want of potash in any form, combined or uncombined for cotton, there is an absolute loss this year.

PLOT 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 separated or combined? And incidentally the question is asked, *do fertilizers effect germination in shallow applications?* The following are the results:

FIRST PLOT NO. 4—COTTON. DEPTH OF MANURE COMBINED.

Number of Experiment.	Kind and Quanity of Manure Used, per acre.	Depths of Applications.	First picking, September 27th.	Second picking, October 14th.	Third picking, November 18th.	Yield of cotton in seed per acre.
1	160 lbs. acid phosphate 40 lbs. muriate potash 360 lbs. cotton seed meal	6 to 8 inches.	340	90	120	550
2	160 lbs. acid phosphate 40 lbs. muriate potash 360 lbs. cotton seed meal	4 to 6 inches	460	100	100	660
3	160 lbs. acid phosphate 40 lbs. muriate potash 360 lbs. cotton seed meal	2 to 3 inches.	570	110	110	750
4	160 lbs. acid phosphate 40 lbs muriate potash 360 lbs. cotton seed meal	Top dressed.	520	140	80	740

Two to three inches give best results, followed closely by "top dressed." Concurring results of previous years bear out the wisdom of shallow application of fertilizers in this soil. Six to eight inches deep give poorest yield.

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

In this plot 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 PLOT NO. 4—COTTON—DEPTH OF MANURES USED SEPARATELY.

Number of Experiment.	Kind and quantity of manure used, per acre.	How deeply applied.	First picking, Sept. 27.	Second picking, Oct. 14.	Third picking, Nov. 18.	Total cotton in seed per acre—pounds.
1	320 pounds acid phosphate 80 pounds muriate potash	6 to 8 inches	340	120	120	590
2	320 pounds acid phosphate 80 pounds muriate potash	Top-dressed.	330	140	100	570
3	320 pounds acid phosphate 80 pounds muriate potash 720 pounds cotton seed meal	2 to 3 inches	400	130	100	630
4	320 pounds acid phosphate 80 pounds muriate potash 720 pounds cotton seed meal	4 to 6 inches. Top-dressed.	240	100	100	440

Again 2 to 3 inches give best results, 6 to 8 next, and top-dressed next, and No. 4 where the fertilizers are separated, the phosphate and potash placed 4 to 6 inches and the meal "top-dressed" give poorest results. By comparing the results of the two plots, fertilizers "combined" seem the better place of application.

Shallow application of fertilizers interfere with germination.

PLOT NO. 5—COTTON—DISTANCE EXPERIMENTS.

WHAT DISTANCE SHALL COTTON BE PLANTED IN DRILL FOR BEST RESULTS?

Number of Experiment	What distance apart and number of stalks in drill.	First picking, Oct. 1.	Second picking, Oct. 24.	Third picking, Nov. 18.	Total cotton in seed, per acre—pounds.
1	One stalk, 3 inches in drill	250	320	160	730
2	Two stalks, 8 inches in drill	340	310	150	800
3	One stalk, 12 inches in drill	370	290	180	840
4	Two stalks, 12 inches in drill	350	370	190	810
5	One stalk, 16 inches in drill	330	360	220	910
6	Two stalks, 16 inches in drill	320	....	610	930
7	One stalk, 20 inches in drill	280	....	640	920
8	Two stalks, 20 inches in drill	240	....	720	960
9	Two stalks, 24 inches in drill	210	....	660	870

Two stalks 20 inches give best results.

Two stalks 16 inches give next best.

One stalk 20 inches give next best.

One stalk 16 inches give next best.

Two stalks 24 inches give next best.

The results here vary with the seasons, but declare most for greater distance. Cotton should be given more distance in the drill than is ordinarily allowed.

PLOT NO. 6—COTTON—APPLICATION OF MANURES.

Nitrogen is very soluble. In the soil it is readily converted into ammonia, nitrates and nitrites, in which forms it is available as plant food. But the loose sandy character of this soil and the solubility of the 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 plot 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 the 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 the first. Cultivation same as previous plots.

Below are the results:

PLOT NO. 6—COTTON—APPLICATION OF MANURES.

Number of Experiments.	Kind and Quantity Manure Used per Acre.	When Applied.	First picking, Sept. 27.	Second picking, Oct. 14.	Third picking, Nov. 18	Total amount of seed cotton per acre, pounds.
1	240 lbs. mixed minerals. 160 lbs. nitrate soda	At planting, April 27.	270	260	150	680
2	240 lbs. mixed minerals. 80 lbs nitrate soda. 80 lbs. nitrate soda	At planting, April 27. At laying-by, July 11.	200	200	120	520
3	240 lbs. mixed minerals. 53⅓ lbs. nitrate soda. 53⅓ lbs. nitrate soda. 53⅓ lbs. nitrate soda	At planting, April 27. Second working, June 10 At laying-by, July 11	170	130	100	400
4	240 lbs. mixed minerals. 120 lbs. sulphate ammonia	At planting, April 27	260	230	140	630
5	240 lbs. mixed minerals. 60 lbs. sulphate ammonia. 60 lbs. sulphate ammonia	At planting, April 27 At laying-by, July 11	260	180	100	540
6	240 lbs. mixed minerals. 40 lbs. sulphate ammonia. 40 lbs. sulphate ammonia. 40 lbs. sulphate ammonia	At planting, April 27 Second working, June 10 At laying-by, July 11	200	170	110	480
7	240 lbs. mixed minerals. 360 lbs. cotton seed meal	At planting, April 27	80	240	180	500
8	240 lbs. mixed minerals. 180 lbs. cotton seed meal. 180 lbs. cotton seed meal	At planting, April 27 At laying-by, July 11	90	210	140	440
9	240 lbs. mixed minerals. 120 lbs. cotton seed meal. 120 lbs. cotton seed meal. 120 lbs. cotton seed meal	At planting, April 27 Second working, June 10 At laying-by, July 11	100	210	110	420
10	240 lbs. mixed minerals. 160 lbs nitrate soda. 120 lbs. sulphate ammonia. 360 lbs. cotton seed meal.	At planting, April 27	90	380	310	780
11	240 lbs mixed minerals. Plus one-half nitrogen mixture of experiment 10. Plus ¼ nitrogen mixture of ex. 10.	At planting, April 27 At laying-by, July 11	180	390	260	830
12	240 lbs. mixed minerals. Plus ¼ nitrogen mix. of expt. 10 Plus ¼ nitrogen mix. of expt. 10. Plus ¼ nitrogen mix. of expt. 10.	At planting, April 27 Second working June 10 At laying-by, July 11	230	320	200	755

In every case except one there has been a loss with two and three applications. The long tap root of cotton certainly intercepts the nitrogen as it sinks in the soil. There is no profit in making two and three applications with cotton. Fertilizer should all be applied at planting.

PLOT NO. 4—COTTON VARIETIES.

There are many varieties of cotton offered yearly on our markets with flaming estimates of their great excellence and peculiar merits. The Station has spared no effort in obtaining and testing as many of these varieties as possible. Forty were planted last spring, but 6 were lost in germinating, leaving 34 tested. 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 carefully weighed in field and at gin and ginned separately on a small Gullett gin, with feeder and condenser; lint and seed carefully weighed and per cent. of each calculated. Attention is called to the comparative yields by pickings.

Following are the results:

PLOT NO. 4—COTTON VARIETIES.

No. of Experim't.	Name of Variety.	First picking, October 1.	Second picking, November 15.	lbs. seed cotton per acre—field weight.	Per cent. lint.	Per cent. seed.	Remarks
1	Kennith	300	460	760	28.94	71.06	E. Fudicka, Monroe, La.
2	Cook's Long Staple	230	390	620	29.03	70.97	State Experiment Station, Baton Rouge, La.
3	Southern Hope	280	460	740	29.72	70.28	Major Thomas McGuire, West Monroe, La.
4	Allen's Long Staple	440	260	700	28.57	71.43	Alexander Seed Company, Augusta, Ga.
5	Eureka No. 1	440	260	700	30.00	70.00	Colthorp Bros., Milliken's Bend, La.
6	Eureka No. 2	340	260	600	30.00	70.00	W. B. Humphries, Keithville, La.
7	Eureka No. 3	340	220	560	28.55	71.45	State Experiment Station, Baton Rouge, La.
8	Cook's Long Staple No. 2	380	220	600	30.00	70.00	State Experiment Station, Baton Rouge, La.
9	Colthorp's Pride	400	460	860	32.14	67.86	Colthorp Bros., Milliken's Bend, La.
10	Peterkin	400	200	600	33.33	66.67	Alexander Seed Company, Augusta, Ga.
11	Hawkins' Improved No. 1	240	360	600	33.33	66.67	Alexander Seed Company, Augusta, Ga.
12	Tennessee Gold Dust No. 1	370	130	500	32.00	68.00	Alexander Seed Company, Augusta, Ga.
13	Dickson	350	170	520	30.76	69.24	Mr. Prevost, New Orleans, La.
14	Mathews' Ex-Long Staple	140	300	440	27.27	72.73	State Experiment Station, Baton Rouge, La.
15	Drake's Cluster	350	210	560	32.14	67.86	State Experiment Station, Baton Rouge, La.
16	Bancroft's Prolific Long Staple	340	220	560	28.57	71.43	Alexander Seed Company, Atlanta, Ga.
17	Excelsior	360	200	560	35.71	64.29	State Experiment Station, Baton Rouge, La.
18	Cochran's	310	250	560	32.14	67.86	State Experiment Station, Baton Rouge, La.
19	Hunnicut	220	220	440	31.81	68.19	State Experiment Station, Baton Rouge, La.
20	Texas Storm and Drouth-Proof	300	240	540	33.33	66.67	W. B. Smiley, Baileyville, Tex.
21	Okra Leaf	250	170	420	30.9	69.05	Alexander Drug and Seed Co., Augusta, Ga.
22	Willis	160	280	440	31.81	68.19	State Experiment Station, Baton Rouge, La.
23	J. O. Morris	280	320	600	33.33	66.67	J. O. Morris, Garsville, La.
24	W. B. Ethridge Short Staple	160	160	320	31.25	68.75	W. B. Ethridge, Downeville, La.
25	Tennessee Gold Dust No. 2	330	310	640	31.25	68.75	Home-raised.
26	Bancroft's Herlong	260	340	600	30.0	70.00	Alexander Seed Company, August . La.
27	Peterkin's New Cluster	260	440	700	34.28	65.72	Alexander Seed Company, Augusta, Ga.
28	Peerless	200	520	720	30.55	69.45	Mr. Prevost, New Orleans, La.
29	Truitt's Improved	250	490	740	29.72	70.28	Alexand r Seed Company, Augusta, Ga.
30	Hawkins' Improved	300	560	860	32.55	67.45	Alexander Seed Company, Augusta, Ga.
31	Marston	180	400	580	31.03	68.97	Sugar Experiment Station, New Orleans La.
32	Welborn's Pet	400	740	1140	31.57	68.43	Alexander Seed Company, Augusta, Ga.
33	Crawford's	240	360	600	33.33	66.67	Alexander Seed Company, Augusta, Ga.
34	Rockett's Improved	290	470	760	31.57	68.43	J. C. Rockett, Farmerville, La.

An inspection of the foregoing table shows great difference in yields of cotton. Some of the 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 20 saw, Gullett gin, and on account of the small amounts of seed cotton ginned in each variety, they are necessarily not exact, but comparatively approximate. The percentages of lint, too, are below what they have heretofore been, due most probably to the very wet season and the dullness of the gin saws.

On application, the Station can furnish small quantities of seed of any of the above varieties by sending postage.

CORN.

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

PLOT NO. 7—NITROGENOUS MANURES.

The questions propounded to this plot are the same as those asked of cotton in plot 1, viz:

1st. Does this soil need nitrogen to grow corn profitably?
2d. If so, in what form must it be presented?
3d. What quantity per acre?

As with cotton the animal, vegetable and mineral forms have been used in single and double rations.

PREPARATION AND CULTIVATION OF PLOT.

In January land deeply and thoroughly broken 8 to 9 inches with two-mule heavy turning plow. Rows marked off with straight shovel 5 feet apart, bedded on with turn plow, opened with bull tongue, distributed fertilizer in drill, ran furrow in fertilizer to incorporate same well with soil, planted and covered with harrow. After cultivation with cultivators, scooters and shovels with heel scrape attached and with hoes, laid by June 8.

Following are results:

PLOT NO. 7—CORN—NITROGENOUS EXPERIMENTS.

Number of Experiment.	Kind and quantity of manure used per acre.	Bus. shelled corn per acre.
1	112 pounds nitrate soda	38
2	112 pounds acid phosphate, 56 pounds kainite, "Mixed minerals"	24.2
3	168 pounds mixed minerals, 112 pounds nitrate soda	30.6
4	168 pounds mixed minerals, 224 pounds nitrate soda	37.6
5	84 pounds sulphate ammonia	21.6
6	168 pounds mixed minerals	11.2
7	168 pounds mixed minerals, 84 pounds sulphate ammonia	29.2
8	168 pounds mixed minerals, 168 pounds sulphate ammonia	33.6
9	No manure	11.2
10	140 pounds dried blood	18.4
11	168 pounds mixed minerals	12.8
12	168 pounds mixed minerals, 140 pounds dried blood	23.2
13	168 pounds mixed minerals, 280 pounds dried blood	30.4
14	352 pounds fish scrap	25.6
15	168 pounds mixed minerals	10.8
16	168 pounds mixed minerals, 252 pounds fish scrap	23.2
17	168 pounds mixed minerals, 504 pounds fish scrap	35.2
18	No manure	10.8
19	252 pounds cotton seed meal	18.8
20	168 pounds mixed minerals	8.1
21	168 pounds mixed minerals, 252 pounds cotton seed meal	16
22	168 pounds mixed minerals, 504 pounds cotton seed meal	26
23	728 pounds crushed cotton seed	17.6
24	168 pounds mixed minerals	10.6
25	168 pounds mixed minerals, 728 pounds crushed cotton seed	46.4
26	168 pounds mixed minerals, 1456 pounds crushed cotton seed	25.8
27	723 pounds green cotton seed	14.2
28	168 pounds mixed minerals	10.9
29	168 pounds mixed minerals, 728 pounds green cotton seed	13.6
30	168 pounds mixed minerals, 1456 pounds green cotton seed	20
31	No manure	10
32	2940 pounds compost	24
33	168 pounds mixed minerals	10
34	2940 pounds compost, 56 pounds kainite	28
35	5880 pounds compost, 56 pounds kainite	24.8
36	720 pounds rotted cotton seed	16
37	168 pounds mixed minerals	6.8
38	168 pounds mixed minerals, 720 pounds rotten cotton seed	16.2
39	168 pounds kainite, 1440 pounds rotten cotton seed	19.8
40	No manure	6

CONCLUSIONS.

The first question, "Does this soil need nitrogen to grow corn successfully?" is answered yes, very positively. Average of no manure is 9.5 bushels and of nitrogen alone 21.8, a gain due to nitrogen of 12.3 bushels per acre. The average of the experiments of nitrogen with mixed minerals. The mixed mineral average is 11 bushels corn per acre. The average of one ration nitrogen, 24 pounds, combined with mixed minerals is 21 bushels per acre, and of two rations, (48 pounds nitrogen) it is 28.5, showing increase over mixed minerals of 10 and 17.5 bushels respectively due to nitrogen, showing conclusively its need for profitable corn production in this soil.

The second question, "In what form is nitrogen best presented?" is not so definitely answered. The excesses of nitrate soda combined and uncombined over its mixed minerals are respectively 13.8, 6.4, 13.2 bushels per acre. The sulphate ammonia excesses combined and uncombined over its mixed minerals are respectively 13.4, 18 and 22.4 bushels per acre. The dried blood excesses over its mixed minerals are respectively 5.6, 10.4 and 17.6 bushels per acre. The excesses of fish scrap over its mixed minerals are respectively 14.8, 12.4 and 24.4 bushels per acre. Likewise cotton seed meal excesses are 10.7, 7.9 and 17.9 bushels per acre. Likewise crushed cotton seed excesses are respectively 7, 6.8 and 15.2 bushels per acre. Likewise green cotton seed excesses are respectively 3.5, 2.9 and 9.3 bushels per acre, while rotten cotton seed, combined and uncombined over its mixed minerals are respectively 10.2, 10.4 and 13 bushels per acre. From the above the mineral forms of nitrogen, nitrate soda and sulphate ammonia have given slightly best results, followed by the animal form, dried blood and fish scrap. But the difference is so little and corn responds so well to any form of nitrogen, cotton seed and its forms, are considered best, being most convenient and economical.

The third question, "What quantity per acre?" from a money standpoint declares in favor of the single ration, or 24 pounds nitrogen per acre. Seasons were good for corn.

PLOT NO. 8.—PHOSPHORIC ACID EXPERIMENTS.

In this plot the same questions are propounded to phosphoric acid as were propounded to cotton in plot 1:

1st. 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?

Below are results:

PLOT. NO. 8—PHOSPHORIC ACID EXPERIMENTS.

No. of Experiment.	Kind and Quantity Manure Used per Acre.	Bushels shelled corn Per acre.
1	56 lbs. gypsum	13.6
2	112 lbs. dissolved bone black	25.2
3	336 lbs. cotton seed meal, 84 lbs kainite = Basal mixture	32.8
4	420 lbs. basal mixture + 112 lbs. dissolved bone black	27.2
5	420 lbs. basal mixture + 224 lbs. dissolved bone black	24
6	56 lbs gypsum	10.8
7	112 lbs. acid phosphate	17.2
8	420 lbs. basal mixture	18.8
9	No manure	8.4
10	420 lbs basal mixture + 112 lbs. acid phosphate	21.2
11	420 lbs. basal mixture + 224 lbs. acid phosphate	25.2
12	112 lbs. bone meal	11.2
13	420 lbs. basal mixture	29.4
14	420 lbs. basal mixture + 112 lbs. bone meal	31.2
15	420 lbs basal mixture + 224 lbs. bone meal	31.2
16	112 lbs. South Carolina floats	13.6
17	420 lbs basal mixture	28.4
18	420 lbs basal mixture + 112 lbs South Carolina floats	28.8
19	420 lbs. basal mixture + 224 lbs. South Carolina floats	30.8
20	No manure	14
21	112 lbs. Thomas Slag	8.8
22	420 lbs. basal mixture	19
23	112 lbs. Thomas slag + 420 lbs basal mixture	24.8
24	224 lbs. Thomas slag + 420 lbs. basal mixture	30.

CONCLUSIONS.

The results with phosphoric acid with corn are similar to those of cotton, viz: That phosphoric acid is needed to produce a profitable crop of corn; that the soluble forms, acid phosphate and dissolved bone black, are preferred; that the double ration is unprofitable; that phosphates are needed in small quantities, and should be combined with nitrogen fertilizers for best results with corn.

PLOT NO. 9—CORN—POTASH EXPERIMENTS.

In this plot the same questions are propounded to potash as were propounded to cotton in Plot 1, viz:

1st. Does this soil need potash to grow corn profitably?
2d. If so, in what form must it be used?
3d. In what quantities per acre?

Cultivation, preparation, etc., same as in other plots.

Following are results:

PLOT NO. 9—CORN—POTASH EXPERIMENTS.

No of Experiment.	Kind and quantity manure used, per acre	Bushels shelled corn per acre.
1	84 lbs. cotton seed hull ashes	11.6
2	336 lbs. cotton seed meal, 168 lbs. acid phosphate } Meal phosphates	25.2
3	504 lbs. meal phosphate, 84 lbs. cotton seed hull ashes	24.
4	504 lbs meal phosphate, 168 lbs. cotton seed hull ashes	25.2
5	No manure	13.6
6	112 lbs. kainite	13.6
7	504 lbs. meal phosphate	26.8
8	504 lbs. meal phosphate, 112 lbs. kainite	26.4
9	504 lbs. meal phosphate, 224 lbs. kainite	25.2
10	28 lbs muriate potash	14.
11	504 lbs meal phosphate	24.4
12	504 lbs meal phosphate, 28 lbs. muriate potash	23.8
13	504 lbs. meal phosphate, 56 lbs. muriate potash	24.8
14	No manure	14.4
15	42 lbs. sulphate potash	14.4
16	504 lbs. meal phosphate	24.
17	504 lbs. meal phosphate, 42 lbs. sulphate potash	24.5
18	504 lbs. meal phosphate, 84 lbs. sulphate potash	24.8

CONCLUSIONS

Are, that the potash is not needed in any form, quantity or combination to grow corn on this soil.

PLOT NO. 10.—CORN.—APPLICATION OF MANURES.

No. of Experiment.	Kind and Quantity Manure Used per Acre.	When Applied.	Bushels shelled corn per Acre.
1	168 lbs. mixed minerals 112 lbs. nitrate soda	At planting, March 29	31.6
2	168 lbs. mixed minerals 56 lbs. nitrate soda	At planting, March 29	32.
	56 lbs. nitrate soda	At laying by, June 8	
3	168 lbs. mixed minerals 37½ lbs. nitrate soda	At planting, March 29	33.
	37½ lbs. nitrate soda	Second working, May 20	
	37½ lbs. nitrate soda	At laying by, June 8	
4	168 lbs. mixed minerals 84 lbs. sulphate ammonia	At planting, March 29	28.8
5	168 lbs. mixed minerals 42 lbs. sulphate ammonia	At planting, March 29	29.
	42 lbs. sulphate ammonia	At laying by, June 8	
6	168 lbs. mixed minerals 28 lbs. sulphate ammonia	At planting, March 29	35.6
	28 lbs. sulphate ammonia	Second working, May 20	
	28 lbs. sulphate ammonia	At laying by, June 8	
7	158 lbs. mixed minerals 252 lbs. cotton seed meal	At planting, March 29	26.8
8	168 lbs. mixed minerals 126 lbs. cotton seed meal	At planting, March 29	28.5
	126 lbs. cotton seed meal	At laying by, June 8	
9	168 lbs. mixed minerals 84 lbs. cotton seed meal	At planting, March 29	32.1
	84 lbs. cotton seed meal	Second working, May 20	
	84 lbs. cotton seed meal	At laying by, June 8	
10	168 lbs. mixed minerals 112 lbs. nitrate soda 84 lbs. sulphate ammonia 252 lbs. cotton seed meal	At planting, March 29	34.4
11	168 lbs. mixed minerals Plus one-half No. 10	At planting, March 29	40.
	Puls one-half No. 10		
12	168 lbs. mixed minerals Plus one-third No. 10	At planting, March 29	41.5
	Plus one-third No. 10	Second working, May 20	
	Plus one-third No. 10	At laying by, June 8	

CONCLUSIONS.

The average of one application is 30.3 bushels.

The average of two applications is 32.1 bushels.

The average of three applications is 35.5 bushels.

The excess of two applications over one application is 1.8 bushels; of three over one is 5.2 bushels, and of three over two is 3.4 bushels.

Concerning results of previous years, declare positively in favor of different applications for corn.

PLOT NO. 11—CORN—VARIETIES.

This plot was fertilized with the Station's compost for corn at rate of 40 bushels in drill per acre at planting. Each variety was weighed in the husk; ten average ears were shucked and shelled—shuck, cob and grain weighed separately and per cent. of each calculated. The value of a corn depends largely upon its per cent. of grain.

Preparation etc., same as in other plots.

Following are results:

RESULTS OF PLOT 11—VARIETIES OF CORN.

Number of Experiment.	Name of Variety.	Where Obtained.	Per cent. grain.	Per cent. cob.	Per cent. shucks.	Bushels shelled corn per acre.	Kind of Corn.
1	Calhoun Red Cob	A. Calhoun, Calhoun, La	75.4	13.10	11.40	38.	Shoe Peg & Red Cob
2	Mosby's Prolific	Sugar Experiment Station	79.8	11.50	8.	378.	White Dent
3	Maryland White	T. W. Wood, Richmond, Va	74.5	13.20	10.80	31.6	White Dent
4	Welborn's Conscience	Alexander Seed Company, Augusta, Ga	78.50	13.10	8.5	36.6	Whit Dent
5	Clarke's Early Mastodon	T. W. Wood, Richmond, Va	76.40	15.10	9.	26.4	Yellow Dent
6	Gerstry's Early Market	" " " "	77.40	13.	9.	29.2	White Dent
7	Virginia White Gourd Seed	" " " "	78.20	13.30	8.8	33.6	White Gourd Seed
8	Banks' Improved Stock	Jenkins & Thoborough, Fayetteville, Tenn.	76.50	77.90	9.4	30.	Strawberry
9	Mammoth White Surprise	T. W. Wood, Richmond Va	75.5	13.20	11.5	30.	White Dent
10	Brazilian Flour Corn	Alexander Seed Company, Augusta, Ga	76.8	16.	9.4	30.	White Dent
11	Hickory King	Richard Frotscher, New Orleans, La	75.8	14.5	9.	22.8	White Dent
12	Riley's Favorite Dent	Alexander Seed Company, Augusta, Ga	74.8	14.	10.5	20.8	White Dent
13	Large White Flint	State Experiment Station, Baton Rouge, La	75.8	13.5	11.4	7.6	White Flint
14	Roberts	" " " " " "	73.9	15.	14.	21.6	White Dent
15	Clark's Flour Corn	Alexander Seed Company, Augusta, Ga.	76.4	16.2	9.5	22.4	White Dent
16	Champion White Pearl	" " " " "	74.8	14.2	10.5	18.	White Flint
17	Blount's Prolific	N. S. Dougherty, Baton Rouge, La	75.8	15.2	8.8	16.6	White Flint
18	Golden Beauty	Richard Frotscher, New Orleans, La	78.5	12.4	9.	9.	Yellow Flint
19	Improved Leoning	" " " " "	77.4	13.	9.	23.2	White Flint
20	Early Yellow Canada		failure				
21	Mosby's Early	Department of Agriculture	79.	11.5	8.	23.2	White Dent
22	St. Charles Favorite Dent	R. Frotscher, New Orleans, La	75.	14.8	9.5	23.2	White Dent
23	Golden Dent Gourd Seed	" " " "	78.30	12.4	9.5	16.8	Yellow
24	Giant Broad Grain	T. W. Wood, Richmond, Va	76.30	13.	9.8	19.6	White Gourd Seed
25	Alabama	Alabama	73.	16.8	9.5	17.6	White Dent
26	Shoe Peg	T. W. Wood, Richmond, Va	79.	11.	8.5	21.6	White Shoe Peg
27	McQuade's	John McQuade, Baton Rouge, La	74.20	16.70	9.3	23.	White Dent
28	Southern Prolific	R. Frotscher, New Orleans, La	86.4	16.2	8.	18.	White Flint

An inspection of the above shows Calhoun Red Cob in the lead, with Mosby close. The best percentage grain comes from Mosby.

Plot No. 13 was devoted to forage crops, fertilized with 200 pounds cotton seed meal and 100 pounds acid phosphate per acre.

Below are results:

PLOT NO 13—FORAGE CROPS.

No. of Experiment.	Name of Variety.	Tons hay per Acre.	Bushels seed per Acre.
1	Pearl millet	*	
2	Jernsalem corn	5.	8.
3	Yellow millo maize	14.	28.5
4	White mil'o maize	13.5	29.
5	Large African millet	15.	37.8
6	Kaffir Corn	10.	24.
7	German millet	4.	....
8	Soja bean	5.	....
9	New orange sorghum	8.	....
10	Kansas orange sorghum	7.5	....
11	Golden rod sorghum	12.8	....
12	White India sorghum	11.3	....
13	Early amber sorghum	6.7	....
14	Coleman sorghum	13.4	....

* Used as a soiling crop.

For history and characteristics of above crops see Bulletin No. 8, Second Series.

PLOT. NO. 14—SUNDRY CROPS.

There are planted in this plot one variety peanuts, one sunflower, one castor bean, one jute, one lintless cotton, fourteen field peas and fourteen of sweet potatoes.

Spanish peanut is a very desirable variety, early, a fine bearer, growth rather erect and easily cultivated. In harvesting the pods all adhere to the vine and can therefore be rapidly gathered. If planted in April will mature a crop in August, and planted as late as July they will make a crop before frost. They are good for following out crop. The pea is smaller than

the Virginia and Georgia varieties, but are sweet, fill out well and show fewer pops than any variety known. Properly harvested they make a splendid hay that all stock eat ravenously. It is highly prized as hay in North Louisiana and for hogs no better crop can be grown. This year it give us 3½ tons magnificent hay per acre.

Jute, castor bean and sunflower grew well and good crops can be obtained.

Lintless cotton was not true to name, bearing nearly half the stalks lint, the quantity seed, too, was much smaller than claimed for it.

COW PEAS.

Pea of the Backwoods or Old Man's Friend—Was brought to notice several years ago by letters of Mr. Edward Fonville, of Onslow, County, N. C., in *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 six weeks after planting. It is a bunch pea strictly, therefore affording not much vine. The seeds are small, cream-colored, slightly pied. Very prolific.

The Unknown Pea—Is a greenish-white color, with blue eye; full size; makes much vine; vigorous growth; late; large and continued bearer; pods long and full; a fine pea.

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 in 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 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.*"

Speckled Crowder—A bunch pea; large, speckled berry; tender and good for table use; not much vine; bears fruit in seventy to ninety days.

Purple Hull Pea—A large white pea; black eye; purple hull; long pods; a great viner; good table pea; renovator of worn soils.

SWEET POTATOES.

The following varieties of sweet potatoes were received from Prof. H. A. Morgan, of the Horticultural Department, at Baton Rouge. They were fertilized with 200 pounds of cotton seed meal, 100 pounds acid phosphate and 100 pounds kainite per acre, and treated exactly alike.

Following are the results.

PLOT NO. 14—SWEET POTATOES.

No. of Experiment.	Name of Variety.	Bushels per Acre.
1	Southern queen	296
2	New Jersey	190
3	Red Nansemond	209
4	Georgia yam	150
5	Sugar yam	133
6	Norton	286
7	Peabody	379
8	Barbadoes	362
9	Pumpkin Yam	134
10	Dog River	141
11	Shanghai or California	249
12	Spanish Yam	201
13	Hayman	305
14	Vineless	160

Two last were set two weeks later than others.

REMARKS.

1. *Southern Queen*—Large; round; light yellow skin and meat; fair quality; very early and popular; a good potato.

2. *New Jersey*—Small; round and oblong; yellow, rusty skin; yellow meat; dry, mealy, and rather poor.

3. *Red Nansemond*—Large, round and oblong; pale red; yellow meat; fair quality; large producer; early; fine for hogs. Among these potatoes were found several deep red, or rather purple skin potatoes, with white meat and long shape—known in North Louisiana as the "Negro" or "Nigger Killer" potatoes, which are highly prized.

4. *Georgia Yam*—Small, round, long and oblong shapes; pale yellow skin and slightly yellow meat; fine quality and resembles very much the common yam of the country.

Sugar Yam—Large and oblong; yellow skin and meat; larger than above, and streaked with light yellow veins; very fine quality and popular.

5. *Norton*—Large, round and oblong shapes; lots of strings; resembles Southern Queen, but not so large and hardy a variety.

Peabody—Large, round and oblong shapes; pale red and resembles Nansemond so strongly, that I think they are the same potato under different names. Further these two potatoes are certainly identical with the Brazillian yam, a large red, early, mealy potato, so popular in North Louisiana for hogs; a great producer. I would call these three potatoes under one name and in North Louisiana that name should be Brazillian yam.

8. *Barbadoes*—Large, round and oblong; yellow skin and flecked with yellow; resembles very much the Sugar yam in form and size; certainly a yam.

9. *Pumpkin Yam*—Medium large; round and oblong, yellow skin; salmon yellow or pumpkin meat; very good and popular yam.

10. *Dog River*—Long; pink skin and salmon flesh; very tough; rather poor here and entirely new.

11. *Shanghai or California*—Known here altogether as California potato; large; round, oblong and long shapes and stringy; white skin and flesh; "bleeds" when cut; prized only for hogs.

12. *Spanish Yam*—Large; round and oblong; light cream, flecked yellow meat; very similar to other yams and not at all like the Spanish potato of North Louisiana, which are long, yellow skin, rather blue meat on cooking, very sweet and highly prized in North Louisiana.

13. *Vineless or Bunch Yam*—Rather small and oblong; white skin; flecked yellow meat; having scarcely any vine; good flavor; but has never produced well here.

Hayman—Rather Large; white skin; rather yellow meat, and round; resembles the Vineless; promises well.

These last two varieties were planted two weeks later and therefore had unequal chance.

SORGHUM.

A good crop of sorghum was raised the past year on the Station. Experiments were continued with the six most promising varieties with the following results:

The New Orange gave 8 tons per acre.
The Kansas Orange gave 7.5 tons per acre.
The Golden Rod gave 12.8 tons per acre.
The White India gave 11.3 tons per acre.
The Early Amber gave 6.7 tons per acre.
While the Coleman variety gave 13.4 tons per acre.

The fertilizer used was 200 pounds cotton seed meal and 100 pounds acid phosphate per acre.

These six varieties were analyzed on August 18 and 27 and September 7 and 14. They yielded as follows:

	Coleman, August 18.	Coleman, August 27.	Coleman, September 7.	Coleman, September 14.	White India, August 18.	White India, August 27.
Total solids..	16.7	17.7	16.5	17.0	13.0	14.7
Sucrose ...	12.8	14.3	12.5	12.5	8.8	10.3
Glucose...	1.58	1.01	1.51	1.85	2.43	24.6
Glucose ratio..	12.34	7.09	12.08	14.80	27.61	23.88

	White India, September 7.	White India, September 14.	Early Amber, August 18.	Early Amber, August 27.	Early Amber, September 7.	Early Amber, September 14.
Total solids..	13.9	15.1	15.0	14.9	12.3	13.2
Sucrose ...	10.9	12.7	11.1	10.8	9.1	9.8
Glucose...	1.13	1.18	2.04	1.99	1.46	1.44
Glucose ratio..	10.36	9.29	18.37	18.42	16.04	14.69

	Golden Rod, August 18.	Golden Rod, August 27.	Golden Rod, September 7.	Golden Rod, September 14.	Kansas Orange, August 18.	Kansas Orange, August 27.
Total solids..	14.2	12.3	15.0	15.4	14.1	15.9
Sucrose ...	11.1	12.4	11.9	12.3	9.6	11.3
Glucose...	1.88	1.29	1.21	.97	2.67	2.88
Glucose ratio..	16.93	10.40	10.17	7.88	27.81	25.48

	Kansas Orange, September 7.	Kansas Orange, September 14.	New Orange, August 18.	New Orange, August 27.	New Orange, September 7.	New Orange, September 14.
Total solids..	15.2	16.9	16.8	14.6	15.3	16.6
Sucrose ...	10.1	14.1	12.3	11.3	10.9	12.2
Glucose...	3.57	.86	3.06	1.94	3.36	2.26
Glucose ratio..	35.34	6.09	24.87	17.16	30.82	18.52

On September 20, 4 58-100 tons of the Coleman variety were ground and worked up into sugar on the small open pan of the Station—875 pounds of masse cuite were obtained which grained nicely and yielded in the centrifugal 38.88 per cent. of its weight in dry sugar, polarizing 90.3, or 74.2 pounds per ton.

The mill extracted 71.15 per cent. of the weight of the cane in juice.

The following figures represent the average composition of the various products named:

AVERAGE OF ANALYSES MADE DURING GRINDING OF SORGHUM.

Product.	Total solids.	Sucrose.	Glucose.	Glucose ratio.
Raw juice	17.6	13.7	1.17	8.54
Limed juice	17.6	13.7	1 22	8.90
Sulphured juice	17 8	13.8	1.15	8.33
Masse cuit	....	76.4	8.19	10.71
Centrifugal sugar	....	90 3	1.51	1.67

On October 26, 27 and 28, 10 36 100 tons of cane were ground. The extraction obtained at the mill was 69.91 per cent. of the weight of the cane, in juice. In all 1272 pounds of sugar and 62 gallons of molasses were made, or 122 pounds sugar and 5.98 gallons of molasses per ton of cane worked.

AVERAGES OF ANALYSES MADE DURING GRINDING OF SUGAR CANE.

Product.	Total solids.	Sucrose.	Glucose	Glucose ratio.
Raw juice	16.3	13.3	1.64	12.33
Sulphured juice	16.4	13.4	1.69	12.61
Limed juice	16.5	13.5	1.71	12.66
Masse cuite	92.3	69.8	12.66	18.13
Centrifugal sugar	....	96.2	1.31	1.36
Pot sugar	....	84.9	3.92	4.61
Molasses	78.6	46.42	27.22	58.63

A sample of the juice which exudes from the butt of the cane as it passes through the mill, and which has frequently been noticed to be devoid of a sweet taste, was examined in the laboratory and yielded the following analyses:

Total solids, 1.18; sucrose, .45; glucose, .27; ash, .09. Evidently the liquid is the soil solution ascending through the plant, mixed with a little saccharine matter.

The experiments with fertilizers were analyzed October 28, yielding as follows:

ANALYSES.

Cane—Fertilizers, per acre.		Total solids.	Sucrose.	Glucose.	Glucose ratio.	Yield per acre in tons.
Plant Cane	1. 280 pounds acid phosphate...	15.7	13.4	1.33	9.9	8.12
	2 280 pounds potash	16.2	13.9	1.39	10.00	10.30
	3. 280 pounds cot on seed meal..	16.4	13.6	1.84	13.52	16.94
	4. 280 pounds acid phosphate... 380 pounds potash	16.7	13.8	1 37	9.92	17.91
	5. 280 pounds acid phosphate... 280 pounds co ton seed meal..	16.3	13.5	1.60	11.85	20.13
	6. 280 pounds cotton seed meal.. 280 pounds potash	15.7	12.6	1.74	13.81	20.38
	7. 280 pounds acid phosphate... 280 pounds cotton seed meal.. 280 pounds potash	16.3	13.9	1.22	8.77	20.98
	8. 560 pounds cotton seed meal..	16.4	13.2	1.77	13.40	19.98
	9. 560 pounds cotton seed meal.. 140 pounds acid phosphate... 140 pounds potash	15.9	12.8	2.78	17.03	17.50
	10. No manure	15.6	12.6	2.08	16.50	10.31

ANALYSES OF VARIETIES OF CANE, NOV. 10, 1892.

Variety.	Total solids.	Sucrose.	Glucose.	Glucose ratio.
Honuaula	14.7	11.0	2.57	23.36
Bamboo	16.9	12.0	2.46	20.50
Kokea	16.5	12.4	2.38	19.19
Otaheite	17.6	14.1	2.12	15.03
Akilolo	15.3	10.6	3.06	27.92
Cavengerie	15.1	9 9	3.16	31.92
Manulite	14.6	9.4	3.63	38.61
Rose Bamboo	15.9	11.9	2.13	17.89
La Pice	17.2	13.9	2.01	4.46
Crystalina	15.9	12.8	1.99	15.54
Lahaina	14.3	10 3	2.49	24.17
Portier	18.2	15.6	1.29	8.27
Loucier	17.0	13.7	2.0	15.11
Altamattie	15.8	9.8	3.76	38.36
Japanese	15.8	10.4	2.81	27.02
Papaa	14.8	9.6	3.03	31.56
Bourbon	15.1	11 2	1.4	12.85
Tibbo Merd	18.0	14.6	1.24	8.49
Parache	17.6	15.1	1.48	9. 0
Papuha	16.7	13.1	2.43	18.54
Ohio	15.7	10.1	3.51	35.04

CONCLUSIONS.

Attention is directed to the results of the experiments in rotation of crops on page 621, with and without fertilizers. The former have paid increased expenses for fertilizers and left hand some profits. The latter have shown slight yearly improvement, particularly with the cereal crops requiring nitrogen. With fertilizers suitable for each crop and the plan of rotation there given, a rapid recuperation of the soil may be expected. Every experiment in fertilization on every crop yet made on the hill lands of North Louisiana shows that these soils need first and foremost nitrogen, the form of the latter being of minor consideration. In very dry seasons the mineral forms have given slightly better results, while in wet seasons, like that of last, the vegetable forms do best. It may therefore be confidently asserted that cotton seed and cotton seed meal furnish this ingredient in a most desirable form, but they should not be used alone, but always combined with acid phosphate, to produce the best

results, since experiments have shown that these soils require phosphoric acid for the full development of nearly all crops grown upon them.

It is also equally certain that potash is not yet demanded by these soils to grow any kind of crop. Even crops of tobacco, corn and Irish potatoes have failed to give increased yields by addition of this ingredient to the above mixture.

The experiments further show that for most of our crops quantities greater than 24 pounds nitrogen and 36 pounds phosphoric acid per acre are not profitable. Even these are, upon very poor soils, excessive and only upon soils in fair tilth and with a good supply of humus, should such quantities be used. Upon the average thin lands of these hills, a mixture of two parts of cotton seed meal and one part of acid phosphate would seem specially adapted to cotton, using from 200 to 400 pounds of it per acre. Upon stronger or richer soils equal parts of the two might prove more remunerative. Experiments extending over several years have conclusively shown that these fertilizers are most efficacious upon cotton when applied at a depth of 2 to 3 inches, and all at once, at the time of planting. Several applications, either separately or combined, have not proven remunerative on cotton. Experiments also show that two stalks of cotton at intervals of 16 to 20 inches in the drill produced the best results.

For corn, more nitrogen and less phosphoric acid are needed than for cotton, yet both should be used in every fertilizer. Two to three parts of cotton seed meal to one of acid phosphate are recommended according to the character of soil. Upon very fair soils the former may be used, while the latter may be applied with profit upon thinner soils. It has been found also that two or even three applications of fertilizers may prove profitable on corn.

Attention is called to the extensive use in North Louisiana of the Spanish peanut as a forage for all kinds of stock.

Emphasis is laid upon the great value of the cow pea as a renovator of soils and the profit accruing from the selection of that variety which will give the largest amount of roots and foliage.

Among the foliage crops, some of the non-saccharine sorghums have given heavy yields of both hay and seed. Estimating the feeding value of the latter as the equal of corn, and add to them the large tonnage of stalks and leaves produced, and a slight idea of the capacity of these crops to cheaply feed stock can be found.

The ability of these soils to grow cheaply large crops of sweet potatoes, suggests at once the propriety of using the surplus for stock feed (particularly hogs). Perhaps this plant upon these soils produces the largest amount of stock feed per acre than any other now grown; Care should be exercised, however, as our table shows, in selecting the variety to be grown.

The accompanying report will give a concise idea of the weather during the past year. It will be seen that the rainfall for the year has been very large and the extremes of temperature 12° and 97° F.

CONDENSED WEATHER REPORT FOR 1892.

(Compiled from the Station Weather Bureau.)

Month.	Maximum temperature.	Date	Minimum temperature	Date.	Average temperature.	Rainfall — in inches.
January	71.	29th	12.	17th	39.7	4.74
February	73.	2d	29.	12th	53.5	5.53
March	81.	31st	21.	18th	51.6	6.43
April	88.	18th	40.	10th	64.1	10.05
May	92.	29th	40.	24th	70.6	2.60
June	97.	10th	55.	3d	78.4	5.37
July	94.	14th	63.	28th	79.5	4.92
August	93.	5th	65.	15th	78.9	4.38
September	89.	26th	49.	15th	72.8	5.01
October	86.	6th	32.	26th	66.2	.87
November	79.	27th	27.	10th	53.0	5.73
December	80.	1st	17.	27th	47.5	9.23
Total for year	1023		440.		755.8	61.87
Mean (monthly)	85.2		36.6		62.9	5.40