1891

Report of the State Experiment Station of the Louisiana State University and A. & M. College at Baton Rouge, La. for 1890

David Nicholas Barrow

SECOND SERIES.

BULLETIN No. 7.

REPORT

OF THE

STATE EXPERIMENT STATION,

—OF THE—

LOUISIANA STATE UNIVERSITY AND A. & M. COLLEGE,

AT

BATON ROUGE, LA.

FOR 1890.

WM. C. STUBBS, PH. D., Director and Official State Chemist.
D. N. BARROW, B. S., Assistant Director.

ISSUED BY THE BUREAU OF AGRICULTURE.
T. S. ADAMS, Commissioner.

PRINTED AT THE TRUTH BOOKAND JOB OFFICE.
BATON ROUGE, LA.
1891.

LA. 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.

LOUISIANA STATE UNIVERSITY AND A. AND M. COLLEGE,
OFFICE OF EXPERIMENT STATION, BATON ROUGE, LA.

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

Dear Sir:

I hand you herewith report of the State Experiment Station for the year 1890, by Mr. D. N. Barrow, Assistant Director, and ask that it be published as Bulletin No. 7, Second series.

Respectfully submitted,

WM. C. STUBBS,
Director.

—:o:—

STATE EXPERIMENT STATION.
BATON ROUGE, LA., JANUARY, 1891.

To Dr. W. C. Stubbs, Director.

Dear Sir:

The accompanying is the report of the result of experiments at this station during the year 1890; while they are not entirely satisfactory, yet it is hoped that a careful study of them will be of some benefit to those interested.

Respectfully submitted,

D. N. BARROW,
Assistant Director.

STATE EXPERIMENT STATION,
BATON ROUGE, January, 1891.

In pursuance with the lines already mapped out in former bulletins this Station has devoted its time, first, to a study of the principle farm products of this neighborhood—the chief ones of which are cotton and corn. Second. To determining the adaptability and value of new crops to this section; and third, to the relative merits of different breeds of live stock for this locality.

Under the first head the experiments have been of three kinds: 1st. An investigation of the merits of the different varieties of seed. The next subject of investigation was the manurial requirements of these crops on this soil, embracing the subjects of both kind and quantity that is best applied. Then the physiological questions of distance, etc., are of no small consequence, and these also received their share of attention.

CORN.

In this report the experiments in corn will be first treated of, and these will be introduced by the study of the

VARIETIES.

On the 17th of March the land being thoroughly prepared, 12 varieties of corn were planted. The beds (5 feet apart) were opened with a bull-tongue. In the furrow thus opened were dropped at regular intervals of two feet three grains of the variety being planted—there being three rows devoted to each variety. The grain was then carefully covered with a hoe. A seasonable rain brought the crop up very prettily, but unfortunately these rains continued for some time. As soon as the weather permitted this corn (then about 12 inches high) was carefully thinned to one stalk to the hill. The grass, however, had grown rapidly during the rains, and despite all care in removing it the stand was more or less injured. After the corn matured each variety was carefully gathered and weighed, and the percentages of shuck, cob and grain determined.

Below is a table giving the results:

VARIETIES OF CORN.

Name.	Yield per Acre.		Per cent. Shuck.	Per cent. Cob.	Per cent. Grain.
	Corn in the Shuck, lbs.	Grain Bushels.			
White St Charles	2522	36.8	8.1	13.1	78.8
*Golden Beauty	965	....	....	....	....
Blount's Prolific	3397	45.6	9.9	16.6	74.5
Champion White Pearl	2302	31.2	8.2	15.4	76.4
Mosby's	4172	58.9	6.6	14.2	79.2
Young's Hybrid	3648	46.0	14.1	14.9	70.8
Hickory King	2280	31.6	10.3	12.0	77.7
McQuaide	3967	53.4	10.5	14.1	75.4
Golden Dent Gourd Seed	3522	46.9	11.6	13.8	74.6
Improved Leoming	2736	35.0	11.0	17.2	71.8
*Large White Flint	989	....	....	....	....
Brazilian Flower	1696	23.5	5.8	15.9	78.3

*So badly weevil eaten when gathered that the percentages could not be determined.

By an examination of this table it will be seen that Mosby, McQuade, Golden Dent, Young's Hybrid and Blount's Prolific lead the list in the order named. During three years test the Mosby, Blount's Prolific and McQuade have been among the first, thus showing themselves to be good. The Golden Dent and Young's Hybrid are new corns to us, but both bear high recommendations for favor. Especially is this the case with the former, as it is at least two weeks earlier than any of its rivals. Another corn whose earliness recommends it, though not among the largest yielders, is the improved Leaming. The low yields of Golden Beauty and large White Flint are partially accounted for by the fact that, though gathered as early as possible, they were almost totally destroyed by weevils—hence no determinations could be made of the relations between shuck, cob and grain.

While examining these results, it is well for those at a distance to remember that they can only be taken for these conditions of climate and soil. All plants are sensative to a change in these conditions and none more so than corn.

MANURIAL EXPERIMENTS IN CORN.

Plats 9, 10 and 11, were devoted to the questions of the best kinds and quantities of fertilizer for corn. The question "Does this soil need Potash, Phosphoric Acid or Nitrogen to grow corn, and if so, in what form and quantity are they needed?" was put to each plat. All the experiments were planted March 6th, with Red Cob Gourd Seed corn. On March 27th, the stand being very poor, this was plowed up and replanted with a non-descript corn, the only seed we then had. Even then a poor stand was obtained. The following tables give the fertilization and yield per acre.

CORN—PLAT 9 POTASH.

Number of Experim't	How Fertilized.	Yield Per Acre.	
		Shuck Corn lbs	Grain Bushels.
1	Meal Phosphate,* 168 lbs. Kainite	2968	39.7
2	Meal Phosphate, 336 lbs. Kainite	3808	50.9
3	Meal Phosphate	3684	49.3
4	Meal Phosphate, 42 lbs. Muriate Potash	3864	51.7
5	Meal Phosphate, 84 lbs. Muriate Potash	3804	50.9
6	Meal Phosphate	3684	49.3
7	Nothing	2968	39.7
8	Meal Phosphate, 42 lbs. Sulphate Potash	3852	51.1
9	Meal Phosphate, 84 lbs. Sulphate Potash	3524	47.1
10	Meal Phosphate	3920	52.4
11	280 lbs Acid Phosphate, 196 lbs Cotton Seed Meal, 49 lbs. Nitrate Potash	3684	49.3
12	280 lbs. Acid Phosphate, 84 lbs. Cotton Seed Meal, 98 lbs. Nitrate Potash	3864	51.7

*Meal Phosphate—280 lbs. Cotton Seed Meal.
280 lbs. Acid Phosphate.

CORN—PLAT 10—PHOSPHORIC ACID.

Number of Experiment.	How Fertilized.	Yield per Acre.	
		Shuck Corn lbs	Grain Bushels.
1	Basal Mixture,* 280 lbs. Dissolved Bone	3080	41.1
2	Basal Mixture, 560 lbs. Dissolved Bone	3472	46.5
3	Basal Mixture	3080	41.1
4	Basal Mixture, 280 lbs. Acid Phosphate	3864	51.7
5	Basal Mixture, 560 lbs. Acid Phosphate	3808	51.
6	Basal Mixture	3640	48.7
7	Nothing	2912	39.
8	Basal Mixture, 280 lbs. Bone Meal	3864	51.7
9	Basal Mixture, 360 lbs. Bone Meal	3752	50.2
10	Basal Mixture	3528	47.2
11	Basal Mixture, 140 lbs. Gypsum	3292	44.
12	Basal Mixture, 280 lbs. Gypsum	3080	41.1

*Basal mixture—280 lbs. Cotton Seed Meal.
347.2 lbs. Kainite.

CORN—PLAT 11—NITROGEN.

Number of Experiment	How Fertilized.	Yield Per Acre.	
		Shuck Corn lbs	Grain Bushels
1	Mixed Minerals,* 79.8 lbs. Nitrate Soda	2912	39.
2	Mixed Minerals, 159.6 lbs. Nitrate Soda	3696	49.5
3	Mixed Minerals, 53.2 lbs Sal. Ammonia	3304	44.2
4	Mixed Minerals, 106.4 lbs. Sal. Ammonia	3808	51.0
5	Mixed Minerals. 112 lbs. Dried Blood	3192	42.7
6	Mixed Minerals, 224 lbs. Dried Blood	3304	44.2
7	Mixed Minerals, 140 lbs. Fish Scrap	2688	36.
8	Mixed Minerals, 280 lbs. Fish Scrap	3416	45.6
9	Mixed Minerals, 168 lbs. Cotton Seed Meal	2800	37.5
10	Mixed Minerals, 336 lbs. Cotton Seed Meal	3360	45.
11	Mixed Minerals, 504 lbs. Cotton Seed	2800	37.5
12	Mixed Minerals, 1008 lbs. Cotton Seed	1232	22.

Mixed Minerals—280 lbs. Acid phosphate.
347.2 lbs. Kainite.

From such slight variations in yield, it is impossible to draw any conclusions, and hence the questions of form and quantity of fertilizer will have to remain for renewed study. But a careful comparison of the three plats will prove instructive and results in more than a suspicion that we have found the answer as to the kind of plant-food most needed. It will be found that in each plat wherever the fertilizer contains Phosphoric Acid, there is an increase in yield. Did this only occur in a few instances, we would be wary of stating it as a fact, but when it is so universally the case we think we are safe in announcing that the most important element of plant-food on these bluff soils for corn is Phosphoric Acid. Nor are these results the sole evidence on which this statement is based. It will be remembered by those who have studied the bulletins of this station that though injured by drought, last year's experiments hinted to us that this was the case. The beneficial effects of the Phosphoric Acid were very plain upon the growing corn, both last season and this. It is particularly to be regretted that there was so poor a stand this year as the benefits of Phosphoric Acid would in all probability have been much plainer.

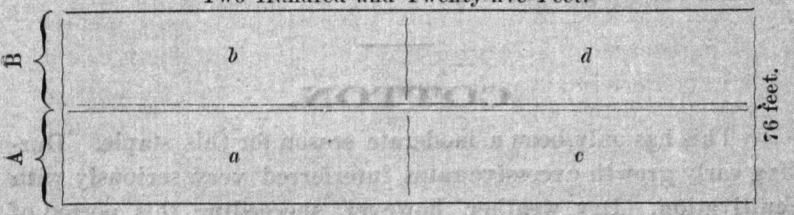
PHYSIOLOGICAL EXPERIMENTS WITH CORN.

Plat No. 15 was set aside for this purpose. It is perfectly level and having been in cotton the year before and been broken up in the fall was in splendid order. It was rebroken on March 21st, with two horse sulkey plow and harrowed till thoroughly pulverized and level. It was then checked off 3 x 4 feet with bull-tongue.

From three to four grains of McQuadie's corn were dropped by hand at the intersection of the check, the whole covered with a smoothing harrow and water drains opened all around the edge of the plat, When the corn was about six inches high this plat was first divided into two equal parts longitudinally. Each of these parts were in their turn divided equally by an imaginary line running across the plat. The following diagram will illustrate it better.

PLAT 5.

Two Hundred and Twenty-five Feet.



A and B are the first divisions of the plat, *a*, *b*, *c* and *d*, subdivisions.

a and *b* were then thinned by hand to one stalk to hill, *c* and *d* to two stalks.

Then a mixture of equal parts of Cotton Seed Meal and Acid Phosphate was applied to A at the rate of 200 lbs. per acre.

This was dropped by hand at the foot of the corn and a smoothing harrow run both ways. Three weeks later the harrow was again run through the crop. *This was all the cultivation it received.*

The questions for solution were:

1st. Will flat cultivation succeed here? Answered by whole plat.

2d. With flat cultivation, how thick will corn succeed on this soil unfertilized?

3d. When moderately fertilized?

The following is the yield per acre (in bushels of shelled corn) of the minor plats *a*, *b*, *c* and *d*.

a—Fertilized, 1 stalk to the hill, 42.4 bushels.
b—Unfertilized, 1 " " " 41.7 "
c Fertilized, 2 stalks " " 63. "
d—Unfertilized, 2 " " " 65.4 "

This has been a very wet season, so the plat undoubtedly answers the question of flat cultivation in the affirmative, at least for that sized field. Two stalks are none too thick for corn planted 3 x 4 *in a wet season.* Fertilizer applied after the corn was up at that rate on good land has done no good. This experiment should be closely studied by every farmer, for it not

only economizes labor, but avoids the tremendous loss caused by careless handling of the hoe.

COTTON.

This has only been a moderate season for this staple. During early growth excessive rains interferred very seriously with cultivation. Dry weather, however, succeeding this period of rain enabled the plant to catch up with what it had lost, and at one time it looked as though the phenomenal yields of last year would be repeated. Heavy rains again set in however, causing a great deal of shedding, and where at all thick rotting a great many half matured bolls of the bottom crop. A greater part of this crop was lost by this cause and the rest was badly injured. When picking commenced, exceptionally fine weather enabled the saving of nearly every lock.

With much trouble the station secured and planted under as near like conditions as possible twenty

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VARIETIES OF COTTON.

Great care was exercised, both in the cultivation and saving of each—all conditions being kept as near the same as possible. After the cotton was all picked, each variety was carefully ginned on a small 20 saw Gullett gin, and the percentages of lint, seed and motes carefully calculated.

The following table gives results per acre:

VARIETIES OF COTTON—PLAT O.

YIELD PER ACRE.

Name of Variety.	Seed Cotton Lbs				Per Cent. Lint.	Per Cent. Seed.	Per Cent. Trash.	Lbs. Lint Per Acre
	1st. Picking	2d. Picking.	3d. Picking.	Total.				
Allen's Long Staple	728	504	224	1456	25.00	70.00	5.00	364.0
Peterkin	560	728	392	1680	25.00	70.00	5.00	420.0
Dickson's Improved	420	616	280	1516	28.00	69.00	3.00	335.4
Bolivar County	616	672	...	1288	29.41	69.11	1.58	378.8
Peerless	672	504	28	1204	32.50	66.00	1.50	391.3
Petit Gulf	532	560	252	1344	30.76	67.30	1.94	413.4
Mexican	476	588	280	1244	27.50	69.64	2.86	331.1
Ellsworth	378	378	42	798	.....	.....	....	.....
Fishburn	252	672	252	1176	.....	.....	....	.....
Boyd's	672	448	168	1288	30.00	67.50	2.50	386.4
W. J. Cook	448	420	196	1064	25.00	71.88	3.12	266.0
T. J. King	952	420	28	1400	32.50	65.00	2.50	455 0
Haggerman	560	896	728	2184	29.31	68.10	2.59	640.1
Southern Hope	504	896	728	2128	27.50	70.00	2.50	581.2
Texas Storm and Drouth Proof	196	588	560	1344	33.33	64.28	2 39	448.0
Okra	840	728	196	1760	31.70	67.07	1.23	557.9
Welbon's Pet	784	952	364	2100	29.00	70.00	1.00	609.0
Hawkins	140	700	728	1568	32.35	65.00	2.65	507.2
Herlong	224	840	672	1736	30.95	67.15	1.90	537.2
Little Brannon	462	546	616	1624	29 31	68.10	2.59	475.9

It will be noticed that the percentages are far below those of last year. This was so marked upon the first determination, that, for fear that from some unknown cause the tests were not reliable, the work was done again. This second determination only corroborated the first; hence we are forced to the conclusion that the low percentages are due to the climatic conditions of this season. A comparison, therefore, on this season's work would scarcely be just.

By an inspection of the first three columns of the above table, however, some idea of the merits of the various cottons as regards earliness may be formed. The Bolivar County, Peerless, Ellsworth and T. J. King had virtually matured all their crop by the time of the second picking. Next came Allen, Peerless, Ellsworth, Boyd's and Okra, with 50 per cent. and so on down, while Hawkins does not open the majority of its crop until the last.

EXPERIMENTS IN FERTILIZING COTTON.

Very near the same experiments were made with cotton as with corn, the difference being that in the nitrogen and phosphoric acid plats a greater variety of substances was used.

In plat 12 it was endeavored to obtain answers to the questions: Does this soil need nitrogen? If so, in what form and quantity is that ingredient best supplied? The following table gives the experiments with their results:

COTTON—PLAT 12—NITROGEN.

Number of Experiment.	How Fertilized.	Yield Per Acre.	
		Seed cotton lbs.	Lint lbs.
1	Mixed Minerals,* 79.8 lbs. Nitrate Soda	2346	782
2	Mixed Minerals, 159.6 lbs Nitrate Soda	2534	844
3	Mixed Minerals, 53.2 lbs. Sulphate Ammonia	2184	728
4	Mixed Minerals, 106.4 lbs. Sulphate Ammonia	2346	782
5	Mixed Minerals	2374	791
6	Nothing	1554	518
7	Mixed Minerals, 112 lbs. Dried Blood	2240	746
8	Mixed Minerals, 224 lbs. Dried Blood	2128	709
9	Mixed Minerals, 140 lbs. Fish Scrap	2366	788
10	Mixed Minerals, 280 lbs. Fish Scrap	2296	798
11	Mixed Minerals	2170	723
12	Nothing	1274	424
13	Mixed Minerals, 168 lbs. Cotton Seed Meal	2030	673
14	Mixed Minerals, 336 lbs. Cotton Seed Meal	2520	840
15	Mixed Minerals, 504 lbs Cotton Seed	2240	746
16	Mixed Minerals, 1008 lbs. Cotton Seed	2198	732
17	Mixed Minerals	1946	642
18	Nothing	997	332

*Mixed Minerals—280 lbs Acid Phosphate.
347.20 lbs. Kainite.

A study of this table will show that no positive answers can be drawn from it. The results of experiments two and fourteen, however, would seem to indicate that Nitrogen in the forms of Nitrate of Soda and Cotton Seed Meal in large quantities does yield some benefit. We are the more willing to attribute the increase in experiment No. 2 to the Nitrate of Soda, since the yield of last year was similar. This experiment leading all the others in both years. With these two exceptions there is very little to be said of the benefits of Nitrogen, for it will be seen that "mixed minerals" in which this substance was totally wanting compares very favorably with all its nitrogenous competitors.

Plat No. 13 was devoted to Phosphatic fertilizers.

The following table gives results:

COTTON—PLAT 13, PHOSPHORIC ACID.

Number of Experiments	How Fertilized.	Yield Per Acre. Seed Cotton lbs.	Lint lbs.
1	Basal Mixture,* 280 lbs. Dissolved Bone	1610	533
2	Basal Mixture, 560 lbs. Dissolved Bone	2184	728
3	Basal Mixture, 280 lbs. Acid Phosphate	2294	764
4	Basal Mixture, 560 lbs. Acid Phosphate	2464	821
5	Basal Mixture	2198	732
6	Nothing	1120	373
7	Basal Mixture, 280 lbs. Reverted Dissolved Bone	2338	779
8	Basal Mixture, 560 lbs. " " "	2058	686
9	Basal Mixture, 280 lbs. " Acid Phosphate	2240	746
10	Basal Mixture, 560 lbs. " " "	2146	715
11	Basal Mixture	1834	611
12	Nothing	1624	541
13	Basal Mixture, 280 lbs. Bone Meal	1984	661
14	Basal Mixture, 560 lbs. Bone Meal	2282	760
15	Basal Mixture, 140 lbs Gypsum	2184	728
16	Basal Mixture, 280 lbs. Gypsum	1946	648
17	Basal Mixture	1862	620
18	Nothing	1667	555

*Basal Mixture, 280 lbs. Cotton Seed Meal, 347.2 lbs. Kainite,

Here, too, the yields are so nearly alike that conclusions as to form and quantity would not be reliable. In only one instance (see experiment 4) has there been any marked increase over other experiments containing phosphoric acid. This would seem to argue that phosphoric acid in the form of acid phosphate is best. If such were a fact, Experiment No. 3, where half the quantity of acid phosphate was used, should give the next largest yield. This, however, is not the case; hence the increased yield of No. 4 is probably more due to some slight difference of conditions, such as a greater fertility of soil, or a better stand, than to any particular benefit of acid phosphate.

An examination of the whole plat. however, will lead to very near the same conclusion (though not so plain) as was arrived at with corn *i. e.*, that phosphoric acid in some form is greatly needed on this soil. As with corn so here the presence of phosphoric acid always insures an increased yield. This is not only the case in this plat, but also in those of nitrogen and potash.

PLAT 14—POTASH.

At first glance at these results, and indeed after a close study, one, who was not acquainted with the circumstances, would pronounce that potash was most decidedly beneficial. This, however, is not necessarily the case. Although Experiments 5, 6, 11 and 12, where potash is absent, are much lower than their neighbors, this falling off is easily accounted for by the fact that these four were badly attacked by blight early in the season, while the others were comparatively free from it. Might not the presence of potash have acted as a germicide to prevent this disease? This is only a question that arises, but one which we are not prepared to answer. It is probably not so, as from all investigations on the subject, and from our own observations, we are strongly inclined to attribute this disease to excessive moisture rather than to any inherent defect in the soil. These figures, however, are worthy of remembrance in investigations on this subject. Annexed we give the results of these experiments:

COTTON—PLAT 14—POTASH.

Number of Experiment.	How Fertilized	Yield Per Acre.	
		Seed Cotton lbs.	Lint lbs.
1	Meal Phospha4e,* 168 lbs. Kainite	1792	597
2	Meal Phosphate, 336 lbs. Kainite	2176	725
3	Meal Phosphate, 42 lbs. Muriate potash	2114	704
4	Meal Phosphate, 84 lbs. Muriate Potash	2100	700
5	Meal Phosphate	1484	494
6	Nothing	1288	429
7	Meal Phosphate, 42 lbs. Sulphate Potash	1638	546
8	Meal Phosphate, 84 lbs. Sulphate Potash	2254	751
9	196 lbs. Cotton Seed Meal, 280 lbs. Acid Phosphate, 49 lbs. Nitrate Potash	2436	812
10	84 lbs. Cotton Seed Meal, 280 lbs. Acid Phosphate, 98 lbs. Nitrate Potash	2534	844
11	Meal Phosphate	1456	485
12	Nothing	1274	424

*Meal Phosphate—280 lbs. Cotton Seed Meal.
280 lbs Acid Phosphate.

FORAGE CROPS.

It is too often the custom, when corn is a little past the milk, to go through the fields and strip the leaves from the stalk and save them as fodder. This is a pernicious practice, for not only is the expense greater than the stuff is worth, but by so doing the yield of grain is materially lessened. There are a great many plants that make far better forage than these dried corn leaves, and that can be raised and saved at much less cost.

With a view of determining those of this class (forage crops) best suited to this locality the following were planted.

Yellow Millo Maize—A large tall, thick foliage plant, readily eaten by stock, both green and after curing. Requires from six to eight hours sun to cure. Yielded 19.38 tons of dry forage per acre. The stand was very poor.

Pearl Millet—Familiarly known as Cat-tail, Horse and Egyptian Millet. Furnishes a large amount of green food, but does not make good fodder. Can be cut several times in a year.

Soja Bean—A short, woody plant, bearing a tremendous amount of short, flat, poorly filled pods. The beans are small and round and very hard. Has never proved of much value here.

Conch Pea—This is of the same class as the "Clay Pea." It has a much smaller vine and is a great vine producer. It is said that one quart of these peas when planted will produce enough vines to cover an acre of ground. The vines are easily cured into an excellent hay.

Hungarian grass--Planted May 16th; cut June 30th; yielded 2644 lbs. per acre of an excellent hay. One to two hours' sun a plenty for the purpose of curing. German Millet—Planted May 16th; cut July 4th; yielded 3746 lbs. of good hay per acre. Golden Millet- planted May 16th; cut July 4th; giving a yield of 3282 lbs. per acre.

Particular attention is called to these three plants. In this climate where rain is such a bane to the hay makers' existence, a plant that cures so rapidly is particularly valuable. None of

these required more than four hours sun, and the product was a good yield of very excellent hay, as the following analyses show:

	Moisture.	Fat.	Crude Protein.	Crude Fibre.	Carbo-hydrates.	Ash.
German Millet	6.70	2.45	7.87	30.85	43.53	8.60
Golden Millet.....	6.52	3.75	7.50	31.95	41.53	8.75
Hungarian Grass	10.22	2.92	8.75	25.90	40.51	11.70

Besides the above there were planted patches of White, Blue and Yellow Lupines, and Silver Hulled, Early Japanese and common Buckwheat. The Lupins were a total failure from incipiency. The Buckwheats grew well and to the eye promised fine yields. When cut, however, there was not a grain of fruit—the copious rains having caused a good growth of plant, but prevented the formation of fruit.

GRASSES.

Besides the above plats of one-fourth acre were on February 10th, planted with the following grasses and clovers: Kentucky Blue, *Poa pratensis;* Rescue, *Bromus shaderi;* Red Top, *Agrostis vulgaris;* Orchard, *Doctylis glomerats;* Tall Meadow Oat, *Arrhenatherum avenaceum;* of grasses and of clovers, Crimson, *Trifolium incarnatum;* Alsike, *T. hybridum;* Red, *T. pratense* and Burr, *Medicago Maculata.* Owing to the long period of dry weather succeeding their planting these were a total failure. A patch of Perennial Rye, *Lolium Perenne,* planted two weeks later, was more fortunate. This formed a beautiful bed until finally choked out by native "crab" grass.

Early this fall this native grass was closely cut and removed in hopes that it being a perennial, its roots would have survived the summer and put out again. So far, however, not a blade has appeared and it is more than probable that it is completely killed. These grasses were all replanted this fall with better fortune and are all now up and growing nicely. The results will be given later in a bulletin on grasses and hay.

There were also planted small plats of a large number of other grasses, all of which met with the same fate as the larger ones, i. e.. failed to germinate. They were therefore replanted this fall and are now up and growing nicely. The following is a list of them:

Alfalfa, *Medicago sativa;* Red Clover, *T. pratense;* Alsike Clover, *T. hybridum;* Bakhara Clover, *Melilotus alba;* Burr Clover, *Medicago maculata;* Crimson Clover, *T. incarnatum;* Esparsette, *Hedysarum Onobichis;* Timothy, *Phleum Protense;* Kentucky Blue, *Poa pratensis;* Red Top, *Agrostis vulgaris;* Vetch, *Vicia sativa;* Crested Dog Tail, *Cynosurus cristatus;* Tall Oat, *Arrhenatherum avenaceum;* Orchard, *Dactylis glomarata;* Meadow Fescue, *Festuca pratensis;* Rough Stalked Meadow, *Poa Nemoralis;* Meadow Soft, *Holcus lanatus;* Meadow Fox Tail, *Alopecurus pratensis;* Hard Fescue, *Festuca duriuscula;* Sheeps Fescue, *Festuca ovina;* Italian Rye, *Lalium italicum;* English Rye, *Lolium perenne;* Rescue, *Bramus shraderi;* Texas Blue Grass, *Poa arachnifera;* Para Grass, *Panicum borbonode.*

Of these the two last have been grown on the station for the last three years. They seem to be the only grasses yet tried that are able to survive our warm summers and native grasses. The Texas Blue Grass has recommended itself particularly as it makes an excellent winter pasture. The Para Grass is rather too course to be of much value, besides it is a summer grass and we already have a number of natives its superior.

The following oats and wheats are also now growing nicely; Welcome Oats; Black Russian Oats; Golden Cross Wheat; Everitt's High Grade Wheat; Fulcaster Wheat; Hybrid Mediteranean Wheat; German Amber Wheat; Martin's Amber Wheat; Fultz Wheat; Early Red Clawson Wheat.

FRUIT, ETC.

It was expected and hoped that we would be able in this bulletin to give a good report from the fine orchard. A very unexpected and unseasonable freeze on the 1st of March, after the trees were in full bloom, blasted all such hopes. We were more fortunate than many however, for only two trees were

killed. Though not killed, they were all severely injured, and it required most of the growing season to enable them to recuperate. The same was the case with the smaller fruits, strawberries, raspberries and blackberries.

The grapes had also started growth when caught by the freeze. Though the injury to them was not as great as to the other fruits, yet when combined with the excessive rains of the late spring the two were sufficient to make this crop a failure also. Indeed some of the less hardy varieties have completely succumbed.

SUGAR CANE.

The following are the analyses of twenty-five varieties of sugar cane grown on the station this year.

ANALYSES OF VARIETIES OF CANE GROWN ON STATE EXPERIMENT STATION, BATON ROUGE, LA., 1890.

Variety.	Total Solids.	Sucrose.	Glucose.	Solids not Sugars
Purple	15.0	12.1	2.65	0.25
Striped Mexican	16 0	12.4	2.00	1.60
Rose Bamboo	12.8	9.9	2.77	0.13
Hanuala	12.4	7·4	2.94	2.·6
Ohia	13.1	8.1	4.07	0.93
Papaa	12.6	7.3	4.24	1.06
Otaheite	14.4	8.7	4.24	1.46
Kokea	13.5	9.5	3.41	0.59
Lahaina	13.3	8.7	3.65	0.95
Akiolo	13.8	7.8	5.04	0.96
Ainakea	12.4	7.4	4.66	0.34
Crystallina	16.5	12.9	3 21	0.39
Yellow	14.1	9.3	3.12	1.68
Kanio	9.9	3.0	5.7⁹	1.20
Cavengerie	11.0	6.0	4.07	0.93
Loucier, (No. 1)	14.0	8.7	4.68	0.62
Green	14.0	9.0	3.03	1.97
Bourbon	14.5	11.3	2.04	1.16
Black Java	15.5	12.9	1.73	0.87
Portier	13.4	9.1	2.69	1.61
Blanca d' Otaheite	13.5	8.5	4.08	0.92
Loucier (No. 2)	12.5	7.6	3.92	0.98
Japanese	15.1	9.0	3.29	2.81

These analyses are quite low, but this is easily accounted for by the fact that these are all foreign varieties and are now undergoing a process of acclimation. After this process is completed some of these may prove very valuable as sugar producers.

LIVE STOCK.

The live stock of the station consists of a herd of Holstein cattle, composed of a male, Horace Southland, four years old, and three females, i. e., a full grown cow, "Sophia D," a two year old heifer "Ada," and a nine months old calf "Bessie."

A herd of Jersey's, namely: One male, Prince of Baton Rouge, and "Princess of Beechwood," three years old, "Loucretia S," (this animal has just been sold to Mr. Henry McCall of Donaldsonville, La.,) twenty-one months old, and a ten days old heiffer calf.

The object of these cattle is to test their adaptability to this soil and climate. They have both done well. A sick animal has not been known amongst them.

"Sophia D," the Holstein cow has given with her last calf, dropped October 15th, six gallons of milk per day, from which was obtained one and a quarter lbs. butter. "Princess of Beechwood" has just dropped her third calf and so far no tests have been made with her. With her last calf she gave three gallons per day, this also yielding one and a quarter lbs. butter.

The Holstein heiffer "Ada" gave birth to her first calf at the unusually (for this large breed) early age of seventeen months. Owing to her youth no tests have been made with her. She gives promise of being a deep long milker.

These are all the animals at the pail. Tho station also has a three months old calf, the son of "Sophia D." This was not mentioned in the above list as it has already been sold. Perhaps a word as to the method of raising these calves would not be amiss.

It is generally the custom to allow the calf to run with its mother, i. e., to draw the milk from its mother's udder. This is, to say the least, poor economy and should never be tolerated where the animals are kept for the money to be made from their milk.

In well regulated dairies a few hours after birth the calf is removed from its mother and never sees her to know her again. It should be given its mothers milk for the first week or so, a few days of patience is all that is required to teach it to eat.

This is done by the feeder allowing it to suck the two fingers, they being immersed in milk. After a few lessons the calf will forget the fingers and drink the milk from the pan. All trouble is then over. For the first month it should have pure milk. This can then be gradually changed to skim milk with a little bran stirred in. Gradually increase the bran and if the animal has a tender green pasture by the time it is four month old, the milk can be entirely stopped. Thus it is seen there is a great saving of milk, besides, there is a tremendous saving in worry. The roping of the calf and pulling him away, and the repetition of this operation two or three times during the process of milking to make the cow "let down" her milk are familiar scenes to all. Then how often when we find no milk at the table are we met with the answer that "the cow and calf got together." All of this is avoided by removing the calf. Nor does the calf suffer. but on the contrary, when properly fed seems to thrive better.

Those who try this method once, never return to the other. A word of warning, however, is perhaps necessary. When this method is practiced, be careful to milk the cow dry. Unless this is done there is great risk of spoiling the bag. In the event the bag does not spoil there is a loss, for Dame Nature is economical and only supplies what is needed. Unless all the milk is removed by just so much as is left will the future supply be diminished. For this reason a cow should always be milked at least twice a day. The bulls are both fine specimens of their breed. They are allowed to serve other cattle for the moderate charge of $5.00.

As to which breed is the best, is a question we are not prepared to answer. Both have their admirers. This is a question that the embryo breeder will have to determine for himself as it is largely influenced by proximity to market, scarcity or abundance of food, etc.

The Holsteins are large cattle, requiring an abundance of food but easily fattened and giving in return an abundance of a moderately rich milk.

The Jersey's are on the contrary small, requiring actually a smaller (but relatively larger) amount of food, very difficult to

fatten, and giving in return a medium quantity of very rich milk.

If near a market and there is an abundance of feed then the Holsteins would probably be the best. If on the other hand the products of the dairy have to be shipped before finding a market, or if feed be scarce, then wisdom would point to the Jersey's as the proper animal.

POULTRY.

The poultry yards were so severely and repeatedly depleted by thieves in the early spring and summer that no data as to the relative merits of the different breeds could be kept. The yards are well stocked now, however, and this spring a close study will be made of them.

The following is a list of breeds on hand:

White Crested Polish, Brown Leghorns, Light Brahmas, Langshans, Black Minorcas, White Plymouth Rocks, Barred Plymouth Rocks, White Minorcas, Partridge Cochins, Buff Cochins, White Wyondott.

Building and Improvements.

The building has been of a rather limited amount this year as nearly all the requisite buildings had been erected in previous years. A small laborers cabin was erected in May, as much for the protection of the poultry as for the convenience of the laborer. Besides this there was added to the farm residence a back gallery and kitchen, two very much needed improvements and which make it as comfortable a house as could be wished. Some little additions to the stables to accommodate the increasing number of cattle and a little fencing complete the list.

TILING.

The greatest improvement of the year has been in the form of drainage. The average inhabitant of the bottom lands will no doubt be surprised that thorough drainage is as necessary to

these hill lands as it is to his. To put it a little differently these hill lands suffer as greatly from excess of moisture as do the bottoms. Convinced of the great benefits of drainage on this soil the Station has put in about five acres of tiling, not only for the purpose of improving that soil, but also to illustrate to the farmers of this section the value of this kind of drainage. The Station has not only sought to illustrate the benefits of tile drainage, but is also trying to determine the best depth and distance for placing the tile.

Plats 9, 10, 11, 12, 13 and 14 are devoted to these questions. In plat 9 the 3-inch tiles are placed at an average depth of three feet and are 40 feet apart. In plat 10 the same distance is preserved, but the drains are one-half foot deeper. Again, in plat 11 the distance is the same, but the depth is four feet. In plats 12, 13 and 14 this depth is preserved, but the distance varies, being 20 feet in 12, 30 feet in 13 and again 40 feet in 14. These are very important questions in tile drainage, as upon them depends in a large degree the cost. Of course no report can yet be made on this work, as it has not been done long enough to show any very great benefit. Yet the benefits are already perceptible.

Now as to the cost of tile drainage. The 3-inch tile can be bought f. o. b. in New Orleans for $17 per thousand. The freight per car load lots (18000 lbs) to this point is $24, making the drains cost at Baton Rouge $20 per thousand or two cents apiece. Mr. Adolph Theil, who did this work, will put down the tile at a charge of $5.30 per string of 210 feet. Now, assuming 40 feet apart to be sufficient, we have the following cost per acre;

1050 tiles at 2 cents	$21 00
5 strings of 210 feet, at $5 30	26 50
Total	$47 50

Of course to this must be added the cost of delivering to the field, and also some little allowance for breakage.

The above brings us to the end of our report for 1890. We cannot close this bulletin without expressing the thanks of the

station to Messrs. B. F. Avery & Son for a "Farmers Delight" cultivator and other favors.

Messrs. Deer, Mansur & Co., for a double mould board plow.

The Capitol City Oil Mills for one ton of Cotton Seed Meal.

We have to thank the following periodicals who have so kindly supplied the reading room of the station with their publications.

South Illustrated; Engineering and Mining Journal; Review of Canadian Botany; Southern Live Stock Journal; Maryland Farmer; Agricultural Epitomist; American Farm and Horticulturist; Agricultural Students' Gazette; Western Farmer; Southern Stockman and Farmer; American (Lake Charles); The Microcosm; The Nation; Electrotype Journal; Home and Farm; Weekly Truth; Daily Advocate; Farmers' Club Journal; Pierce's Poultry Gazette; Popular Gardening and Fruit Growing; The New Dairy; Holstein-Friesian Register; Entomologica Americana; Orange Judd Farmer; Rural and Poultry World; Farmer's Home; Canadian Horticulturist; Cultivator and Country Gentleman; Mirror and Farmer; American Rural Home; Practical Farmer; Jersey Bulletin; The Louisiana Planter; Agricultural Journal; Popular Science News; Horticultnral Art Journal; American Agriculturist; American Garden; Farm and Home; Southern Cultivator; Rural New Yorker.

ERRATA.

On page 149, Plat 10, Experiment 9, read 560 lbs. Bone Meal, instead of 360.

On page 149, Plat 11, Experiments 3 and 4, read Sulphate Ammonia, instead of Sal. Ammonia.

On page 154, 1st word in line, 14 from top, omit "Ellsworth."

On page 155, Plat 12, Experiment 4, read 106.4, instead of 1064.