1897

Results of experiments at State Experiment Station, Baton Rouge, La., in corn, cotton, forage crops, tobacco, etc.

David Nicholas Barrow

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BULLETIN

OF THE

AGRICULTURAL EXPERIMENT STATION

WM. C. STUBBS, PH. D., Director and State Chemist.

RESULTS OF EXPERIMENTS

—AT—

STATE EXPERIMENT STATION, BATON ROUGE, LA.,

—IN—

Corn, Cotton, Forage Crops, Tobacco, Etc.,

—BY—

D. N. BARROW, B. S., ASSISTANT DIRECTOR.

ISSUED BY THE BUREAU OF AGRICULTURE AND IMMIGRATION,
J. G. LEE, COMMISSIONER.

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LOUISIANA STATE UNIVERSITY AND A. AND M. COLLEGE,
OFFICE OF STATE EXPERIMENT STATION,
Baton Rouge, Louisiana.

Major J. G. Lee, Commissioner of Agriculture and Immigration, Baton Rouge, Louisiana:

DEAR SIR—I hand you herewith report of experiments in corn, cotton, sugar cane, forage crops and tobacco, made by Mr. D. N. Barrow, Assistant Director State Experiment Station, Baton Bouge, and ask that it be published as Bulletin No. 47.

Respectfully submitted.

WM. C. STUBBS,
Director.

RESULTS OF EXPERIMENTS.

STATE EXPERIMENT STATION, Baton Rouge, 1896.

While the northern parishes of this State were suffering for rain this section did not by any means receive a redundancy. It is true that at no time was there any danger of a total loss of crops, but the continued dry weather materially cut down all yields by depriving the plants of the moisture necessary for the taking up of available plant food and affected the crops at this station to such an extent as to completely vitiate all results from an experimental standpoint. While this is true, yet the total yields of both cotton and corn are very fair, thus showing to what a great extent the evils of drouth can be mitigated by thorough preparation of the land and frequent cultivations. The

EXPERIMENTS WITH CORN

were a repetition of those of last year. A test of varieties was made in connection with fertilizer tests. The following table gives the yields of 20 varieties:

PLAT 10—VARIETIES OF CORN.

Planted March 13, 1896. *Gathered August* 14, 1896.

No. Experiment.	NAME OF VARIETY.	YIELD PER ACRE.		
		Per cent. cob.	Per cent. grain.	Yield in bushels shuck corn.
1	Whitaker	16.6	81.8	20.6
2	Pylants	15.6	84.3	28.3
3	Creole	20.3	79.7	33.4
4	Blount's Prolific	21.0	78.9	21.8
5	Improved Leoming	20.0	80.0	13.5
6	Pride of America	14.3	85.5	26.3
7	Mosby's Prolific	12.5	86.2	32.1
8	Madison	14.5	85.4	32.1
9	Bucher No. 7	21.4	78.5	15.4
10	*Cocke's Prolific	....	....	21.8
11	Farmer's Pride	15.6	84.4	35.3
12	Champion Yellow Dent	17.1	82.8	16.0
13	Golden Beauty	18.4	76.3	23.8
14	Champion White Pearl	15.6	84.4	32.1
15	Gentry's Early Market	20.6	79.4	23.1
16	Yellow New Madrid	18.8	80.8	23.1
17	Yellow New Madrid	18.8	80.8	24.4
18	Improved Golden Dent	15.0	85.0	27.0
19	Hickory King	14.5	85.3	24.4
20	White Rock Dade	17.4	82.6	20.5

*Too badly weevil eaten when gathered to determine.

The yields per acre are small and are scarcely good criterions of what is possible under ordinary conditions, yet they are comparative. Farmer's pride leads with 35 3 bushels, followed by Creole 33.4; Mosby's Prolific, Madison and Champion White Pearl with 32.1 each. While the total yields are not conclusive of their worth, the per cent. of grain to cob is reliable. In this Mosby's Prolific leads with 96.2 per cent. grain followed closely by Pride of America 85.5, with Madison, Improved Golden Dent and Hickory King good seconds.

FERTILIZER TESTS WITH CORN.

It seems impossible to get conclusive evidence on this subject. For the eight years previous to this our attempts in this direction have met with more or less failure, due to the unfortunate appearance of dry weather just at the time that moisture was most needed by the crop to enable it to reach its highest development. The benefits of phosphoric acid in its various forms have been always apparent during the growth of the plants, but this apparent advantage has been impaired by dry weather and while the increase due to the fertilizers is apparent over the no-manure, there is not a decided response in favor of any form or mixture. In order to, if possible, eliminate this difficulty, these experiments were made in duplicate, one plat being planted a month after the other. The following tables give the result of each plat. Plat 10 has been used for this purpose for nine years. For its duplicate a piece of land that has never had any commercial fertilizer and that had been in peas the year previously was selected. In these experiments the Basal mixture consisted of such quantities of C. S. meal and Kainite as to supply 48 lbs of Nitrogen and 50 pounds Potash. Phosphoric acid was added in the form of dissolved bone black, acid phosphate and bone meal in such quanities that one ration supplies 36 and two rations 72 pounds of phosphoric acid per acre.

DUPLICATE OF PLAT 10—FERTILIZER EXPERIMENT WITH CORN.

Planted April 20th.

No. Exp't.	HOW FERTILIZED.	Yield of Grain.
1	Basal Mixture..... 1 Dissolved Bone Black.....	51.4
2	Basial Mixture..... 2 Dissolve ' Bone Black.....	60.0
3	Basal Mixture.....	61.0
4	Basal Mixture..... 1 Acid Phosphate.....	58.6
5	Basal Mixture..... 2 Acid Phosphate.....	56.8
6	Basal Mixture.....	51.0
7	Nothing.....	53.2
8	Basal Mixture..... 1 Bone Meal.....	60.0
9	Basal Mixture..... 2 Bone Meal.....	59.0
10	Basal Mixture.....	54.4
11	Basal Mixture..... 1 Gypsum.....	54.4
12	Basal Mixture..... 2 Gypsum.....	56.6

PLAT 10—EXPERIMENTS IN CORN. YIELD PER ACRE.

Planted March 15th, 1896.

No. Exp't.	HOW FERTILIZED.	Yield in Grain bu.
1	Basal Mixture..... 1 Dissolved Bone Black.....	55.8
2	Basal Mixture..... 2 Dissolved Bone Black.....	44.8
3	Basal Mixture.....	50.0
4	Basal Mixture..... 1 Acid Phosphate.....	43.6
5	Basal Mixture..... 2 Acid Phosphate.....	40.4
6	Basal Mixture.....	49.6
7	Nothing.....	38.8
8	Basal Mixture..... 1 Bone Meal.....	28.9
9	Basal Mixture..... 2 Bone Meal.....	40.4
10	Basal Mixture.....	42.8
11	Basal Mixture..... 1 Gypsum.....	33.2
12	Basal Mixture..... 2 Gypsum.....	23.8

Plat 10 went pretty well to pieces by the drouth although there is a general increased yield of all fertilized plats over the no-manure. There would also seem to be some indication that the bone black and acid phosphate, the soluble forms

of phosphoric acid, were of some benefit. The two last experiments are designed to test the benefits of gypsum. In the check plat the increase due to the fertilizers is not so large. It would seem that the peas supplied an increased quantity of plant food and therefore in the absence of an abundance of rain, full benefit of the fertilizers were not realized.

COTTON.

The work of the station with cotton, since the introduction of tobacco, has been confined to variety tests with the following results:

PLAT 11—VARIETIES OF COTTON. YIELD PER ACRE.

SHORT STAPLES.	Seed Cotton.	Per cent Lint.	Per cent Seed.	Per cent Loss.	Lint.
Bancroft's Prolific	1527	29.8	66.6	4.6	355
Boyd's Prolific, H. C. P	1527	30.8	67.7	2.5	470
Dickson's Improved (Home)	1457	30.9	65.4	4.7	449
Hawkin's Improved	953	33.3	60.0	6.7	314
Herlong	1426	30.4	67.8	2.2	446
Hutchinson's Storm Proof	1480	30.3	67.2	3.5	448
Hurley's Improved Gold Dust	1629	31.3	65.6	4.1	504
King's Improved	1081	34.1	60.9	6.0	368
*Mound of White	1245	29.7	68.0	3.3	369
Peterkins Improved, Alex. D. & S. Co	1079	37.0	55.5	7.5	398
*Peterkin's Improved, H. C. Prevost	1480	35.1	63.5	2.4	519
Pure Japan Wool	759	30.0	60.0	10.0	227
Texas Storm and Drouth Proof	1715	28.5	68.5	3.0	488
†Truitt's Improved	816	32.6	67.4	....	265
Tyler's (home raised)	1833	31.5	67.1	2.4	577
†Tyler's (H. C. Prevost)	645	26.6	73.4	....	171
Welborn's Pet	1386	29.8	66.6	4.6	412
LONG STAPLES.					
Allen's Long Staple	1128	....	....	....	....
††Affifi	775	....	....	....	....
††Bamia	798	....	....	....	....
*Corubaton	1222	....	....	....	....
*Herbaco	1339	....	....	....	....
*Louisiana	1809	....	....	....	....
Sea Island	376	....	....	....	....
*Unknown	1527	....	....	....	....
*Unknown No. 3	1386	....	....	....	....
*Unknown S. G. S	1664	....	....	....	....

*India cottons. ††Egyptian cottons. †Planted quite late.

The short staples were ginned on our 20 saw Magnolia gin, and the per cent. of lint to seed thus determined. The loss in ginning is unusually large, due to the great quantity of dust that settled in clouds during the whole picking season over all the

field adjacent to the public road. This is particularly noticeable in the case of the pure Japan wool, as this falls out of the boll so rapidly that most of it was picked from the ground. The long staples have not yet been ginned, being held until the arrival of a roller gin which has been ordered from Europe.

FORAGE PLANTS.

Twelve varieties of forage were planted, the yields of which are given in the following table. Ordinarily these are ready for cutting during July and August, when local showers interfere seriously with their curing. Hence, no attempt was made to cure as they are probably more valuable when fed green, especially when not cut. They are all valuable soiling plants, and no well managed farm should be without some of them.

FORAGE PLANTS.

	Yield per acre, lbs.
Teosinte	6,120
Yellow Millow Maize	23,877
White Millo Maize	18,333
Pearl Millet	13,031
Large African Millet	30,345
Black Rice Corn	28,161
Early Amber	17.577
Early Orange	16,674
Jerusalem Corn	8,316
Red Kaffir Corn	21,344
White Kaffir Corn	18,067
Desmodium Molle	42,429

GRASSES AND CLOVERS.

In the fall of 1895 numerous varieties of grasses and clovers were planted. Alfalfa, which gives such splendid results on our alluvial lands, has not been very successful with us on the farm, though the horticultural department of this station has been quite successful for two years with a small area, getting several large cuttings during the year. Persistent efforts are being made to grow it, since its great value as a hay and soiling crop makes it one of the most desirable crops for a farmer. Experiments were made last year, both upon the bluff lands and the bayou bottoms. Upon the latter good stands were obtained and the crops grew well until destroyed by the high water from the Mississippi river. A few stalks survived and are now growing nicely. Upon a permanent flat devoted to alfalfa, upon which it has been sown for seven years, gradually increasing areas have

been obtained of fine plants. It is hoped that a complete occupation of the entire plat by this plant will soon be obtained.

CRIMSON CLOVER

heretofore quite a success, was sown also upon bayou bottoms and met with destruction from the high water.

RED CLOVER.

The plat of this did better than we have ever had it. A good stand was obtained which on April 25th gave nearly two tons of nice hay. In June a second cutting of 1500 pounds was obtained. In the fall of '96 this bed was so promising that it was decided to put the whole seven acre field in which it was located, to this crop. This was accordingly done, and at this writing (March 25th) both the old and new plantings are very promising.

Italian rye grass and orchard and red top, the most promising of former trials with grasses, were also planted. These were severely injured by the dry weather. Italian rye grass possesses the disadvantage of requiring annual seeding. Rescue grass has been tried repeatedly before, but we have heretofore obtained poor stands owing to defective seeds. Only a small plat was devoted to it. The stand was perfect—a beautiful sod was obtained and when heading time came it reached a heigth of three feet. The grass was allowed to seed and enough seed were obtained to re-sow a quarter of an acre last fall. In the mean time the seed shattered in harvesting germinated and, now, both old and new beds, are growing prettily. This is a very desirable grass, furnished most excellent winter grazing, and if it be permitted to go to seed, which it will do in May, before cutting for hay enough seed will be dropped on the land to re-seed it the next fall. A good winter pasture can thus be easily established.

TEXAS BLUE GRASS.

The small plat of this grass, one-tenth of an acre, set out in '87 and '88, is still growing luxuriously. This past winter it has furnished excellent grazing for two Jersey calves and now that they have been removed is shooting up well and will furnish an

early cutting of hay. Despite the difficulty of obtaining a stand (it is first propagated by planting sets 12 inches each away) the Station most heartily recommends it to all who desire good winter pasturage for their stock.

SUGAR CANE.

Experiments with this plant were confined to fertilizer tests. As with other tests of this kind the dry weather severely interfered with results as is evidenced by the universally small yields. In these experiments, as with corn, the Basal mixture, consisting of C. S. meal and kainite, supplied 48 pounds of nitrogen and 50 pounds of potash, while the various forms of phosphoric acid supplied 36 for one and 72 pounds of that ingredient for two rations. In experiment No. 11, 96 pounds of nitrogen and 100 pounds of potash are supplied, while 12 gives 72 of phosphoric acid and 100 of Potash. The following table gives the result:

EXPERIMENTS WITH CANE. YIELD PER ACRE.

No. Exp'm't.	HOW FERTILIZED.	Tons Per Acre	Total Solids.	Sucrose.	Glucose.	Solids not Sugar.	P rity Coefficient.	Glucose Ratio
1	Basal Mixture..... 1 Dissolved Bone.....	11.6	16.9	14.9	1.00	1.00	88.1	6.7
2	Basal Mixture..... 2 Dissolved Bone.....	13.9	17.5	15.7	0.76	1.04	89.1	4.2
3	Basal Mixture.....	12.4	17.5	15.8	0.71	0.99	90.2	4.5
4	Basal Mixture..... 1 Acid Pyosphate.....	12.9	17.5	15.5	0.74	1.26	88.5	4.8
5	Basal Mixture..... 2 Acid Phosphate.....	12.5	17.6	16.2	0.66	0.74	92.5	4.0
6	Basal Mixture.....	14.8	17.8	16.2	0.73	0.87	91.0	4.5
7	Nothing.....	14.0	17.1	15.1	0.69	1.31	88.3	4.5
8	Basal Mixture..... 1 Bone Meal.....	10.1	17.5	15.8	0.71	0.99	90.2	4.5
9	Basal Mixture..... 2 Bone Meal.....	16.0	17.1	15.2	0.83	1.07	88.8	5.4
10	Basal Mixture.....	14.0	17.2	15.6	0.67	0.94	91.2	4.3
11	2 Cotton Seed Meal..... 2 Kainite.....	9.1	17.5	16.0	0.64	0.86	91.4	4.0
12	2 Acid Phosphate..... 2 Kainite.....	10.5	17.4	16.0	0.62	0.78	91.9	3.8

EXPERIMENTS IN ROTATION OF CROPS.

Is it possible to farm these bluff lands and at the same time increase both the yields per acre and the fertility of the soil by a rotation of crops is the question put to this experiment for so

lution. In 1888, when the station first commenced operations at its present location, a field of six acres was accurately laid out to be devoted to a rotation consisting of cotton, corn and peas, oats and peas. Two acres were devoted to each crop, one of which is fertilized yearly with an appropriate fertilizer, while the other receives no manure. Unfortunately, the mechanical condition of the unfertilized acres was far superior to that of the fertilized in regard to drainage. This has materially interfered with results as far as the question of rotation with or without the aid of fertilizers is concerned. The dry weather of this season, together with a system of ditches adopted two years ago, have placed them nearer on an equal footing and the effect of the fertilizers previously applied, is evident in each instance.

ROTATION FIELD. YIELD FOR 1896.

PLATS.	Crop.	Fertilizer Used.	Fertilized Acre.	Unfertilized Acre.
Plat A	Oats	100 lbs Acid Phosphate. 200 lbs C. S. Meal.	43	39.6
Plat B	Corn and Peas.	200 lbs C. S. Meal. 100 lbs Acid Phosphate.	53.8	46.8
Plat C	Cotton	150 lbs C. S. Meal. 150 lbs Acid Phosphate.	496	433

CIGAR TOBACCO

Encouraged by the results of last year, the station repeated its work with tobacco of the cigar types. The severe dry weather not only vitiated the fertilizer experiments, but cut down both total yields and per centages of wrappers.

As during the previous year, the experiments covered the question of varieties, manurial requirements, and methods of curing. Plat 12, formerly devoted to nitrogen experiments in cotton and used the previous year for testing varieties of that plant, was devoted to

VARIETIES

of tobacco. The rows were 3 1-2 feet wide and ran at right angles to the old "nitrogen" rows, thus effectually doing away with any influence from these fertilizers. On April 13th to 17th 22 varieties were set with the following results:

PLAT 12—VARIETIES OF TOBACCO.

No. of Experiment.	VARIETY.	When Set.	When Topped.	When Harvested.	Yield of Cured Tobacco per acre.	Yield of Fermented Tobacco per acre.	Per cent. Loss in Fermenting.	Per cent. Binders.	Per cent Fillers.	Per cent. Loss in Assorting.	Lbs Merchantable Tobacco per acre.
1	Zimmer Spanish	April 13	June 6	July 2	630	588	8.3	14.2	61.9	24.9	442
2	Comstock Spanish. ..	" 13	" 6	" 2	714	658	7.9	14.9	55.3	29.8	462
3	Pumpelly.....	" 13	" 8	" 2	714	644	9.9	28.2	48.7	23.1	496
4	Brazillian American..	" 16	" 20	" 10	938	882	12.4	4.7	28.5	66.8	294
5	East Harttord.....	" 16	" 18	" 10	602	546	9.4	....	33.3	66.7	182
6	Genral Grant.....	" 16	" 20	" 10	756	672	11.2	2.0	39 5	58.5	279
7	Penn. Seed Leaf	" 16	" 22	" 10	728	644	11.6	8.7	60.8	30.5	448
8	Conn Seed Leaf.....	" 16	" 23	" 10	658	602	8.5	...	23.2	76.8	140
9	*Vuelta d'Abojo.....	" 16	" 9	" 2	546	504	7.7	2.7	36.2	61.1	216
10	†Vuelta d'Abojo.....	" 16	" 10	" 2	392	364	8.9	3.8	69.2	27.0	266
11	Harby.....	" 13	" 27	" 10	490	434	12.0	3.2	74.1	22.8	332
12	Cuban Seed Leaf.....	" 17	" 10	" 2	714	658	7.9	19.1	42.5	35.4	232
13	Persian Rose.....	" 16	" 18	" 10	448	406	9.4	....	72.3	27.7	294
14	Partidas.....	" 17	" 18	" 10	434	376	13.4	3.7	51.8	44.5	....
15	Remedios.....	" 17	" 18	" 10	560	476	15.0	....	52.9	47.1	209
16	*Reno de Sumatra ...	" 17	" 12	" 10	756	504	33.4	16.6	66.6	16.8	418
17	*Deli de Sumatra....	" 17	" 18	" 10	504	420	16.7	20.0	80.0	....	420
18	†Reno de Sumatra ...	" 17	" 27	" 10	756	672	11.8	....	75.0	25.0	504
19	†Deli de Sumatra	" 17	" 27	" 10	784	700	10 8	8.0	78.0	16.0	528
20	Big Havana.....	" 17	" 27	" 10	910	818	10.2	17.5	73.1	9.4	742
21	Choice Havana	" 17	" 10	June 29	532	476	10.6	5.8	52.9	41.3	300
22	Havana Seed Leaf....	" 17	" 10	" 29	476	434	9.3	6 4	54.8	38.8	266

*Imported. †Home.

So severely did these suffer from the dry weather that the results are practically worthless. The total yields are scarcely comparative, as the smaller leaved varieties like Sumatra and Vuelta, can scarcely be compared with East Hartford or Seed Leaf. In cigar tobacco it is quality that counts, and this as a rule is indicated best by the wrappers. The crop was so badly injured by drouth that no wrappers were obtained, hence the table conveys no information of value.

EXPERIMENTS IN FERTILIZING.

The land used for these experiments was the same on which like work was done the year previous. The rows had been five feet apart, three of which were devoted to each experiment. This was found to be too great for the best results. Hence, this year each fifteen feet of the former year was divided into four rows making four rows three feet 9 inches by 105 feet to each experiment.

The questions proposed for solution were: the needs of this soil to grow tobacco and the forms and quantities in which the different fertilizing ingredients should be applied. The fertilizers were applied in the drill and thoroughly mixed with the soil just before transplanting. In the experiments nitrogen is used in the form of nitrate of soda, sulphate of ammonia, dried blood, fish scrap and cotton seed meal, and such quantities of each were taken so as to contain 48 pounds of nitrogen for one ration. Therefore in the table, 1 dried blood or one cotton seed meal, etc., means such quantities of each have been taken as to contain 48 pounds of nitrogen. When $\frac{1}{2}$ or 2 have been used before the substance it means 24 or 96 pounds. This same applicaton applies to Phosphate and Potash compounds. The former being used under the forms of Dissolved Bone Black, Acid Phosphate, Charleston Floats and Slag Meal, and 72 pounds of Phosphoric Acid are reckoned one ration. Potash is used under the forms of Kainite, Sulphate, Muriate and Nitrate, and 50 pounds are deemed one ration. Mixed minerals in the following tables means 1 Acid Phosphate (containing 72 pounds of Phosphoric Acid) and 1 Sulphate of Potash (containing 50 pounds of Potash.)

Basal mixture means 1 Nitrate Soda (containing 48 pounds Nitrogen) and one Sulphate of Potash (with fifty pounds Potash). Nitrogen Phosphate is 1 Nitrate Soda (48 pounds Nitrogen) and 1 Acid Phosphate (72 pounds Phosphoric Acid).

By substitution of the above in the tables a clear knowledge of the fertilizer (and quality used) will be obtained.

It will be observed that the fertilizers have been used in such a manner as to answer what ingredients (Nitrogen, Phosphoric Acid and Potash) are needed on this soil and what forms and quantities best supply the wants of this plant.

Three experiments in each plot have been left unfertilized to obtain the natural yield of the soil, while occasional experiments are made with only two of the ingredients, applied so as to test the effect of the absence of each when the other two are applied. Cotton seed meal alone, of the Nitrogenous forms used, contains both Phosphoric acid (3 per cent.) and Potash (2 per cent.) Nitrate of Potash contains both Nitrogen and Potash, but due allowance has been made for its content of Nitrogen when using it as a source of Potash.

PLAT 13. FERTILIZER EXPERIMENTS WITH TOBACCO. YIELD PER ACRE.

No. of Experiment.	HOW FERTILIZED.	When Set.	When Topped.	Method of Curing.	Harvested.	Yield Per Acre. Total.	Unfermented.	Fermented.	Per cent. Lost in Fermenting.	Per cent. Wrappers.	Per cent. Binders.	Per cent. Fillers.	Per cent. Lost in Assorting.	Lbs. Merchantable Tobacco.
1	Basal mixture	April 8	May 30	½ flue	June 30	994	980	924	5.8	9.9	33.5	57.5	....	924
	½ Dissolved bone black			½ air	" 24		1008	924	9.4	6.0	18.1	30.3	45.6	503
2	Basal mixture	" 8	" 30	½ flue	" 30	1120	1120	1084	3.3	5.1	33.5	59.4	2.0	1062
	1 Dissolved bone black			½ air	" 24		112	1036	7.5	8.1	16.2	37.8	37.9	644
3	Basal mixture	" 8	" 30	½ flue	" 30	1120	1232	1176	4.6	4.7	30.9	57.1	7.3	1090
	½ Acid phosphate			½ air	" 24		1008	868	13.9	6.4	12.9	38.7	42.0	362
4	Basal mixture	" 8	" 30	½ flue	" 30	1260	1316	1260	4.3	4.4	37.7	55.5	2.4	1234
	1 Acid phosphate			½ air	" 24		1204	1148	4.7	14.6	19.5	39.0	31.9	782
5	Basal mixture	" 8	June 6	½ flue	" 30	1162	1204	1148	4.7	7.3	29.2	60.9	2.6	1120
				½ air	" 24		1120	952	15.0	11.9	17.6	41.1	28.4	682
6	No manure	" 8	" 10	½ flue	July 1	700	784	728	7.2	....	7.6	92.4	....	728
				½ air	June 29		616	5 8	4.8	....	19.0	76.1	4.9	560
7	Basal mixture	" 8	" 3	½ flue	July 1	1218	1400	1316	6.0	6.4	36.1	55.3	2.2	488
	1 Floats			½ air	June 24		1036	952	8.2	14.7	23.5	47.0	14.8	764
8	Basal mixture	" 8	May 30	½ flue	July 1	1218	1288	1204	6.6	2.3	32.5	65.2	....	1204
	1 Slag meal			½ air	June 24		1148	1064	7.4	13.1	21.0	42.1	23 8	812
9	Mixed minerals	" 8	" 30	½ flue	July 1	994	1064	980	7.9	2.8	25.7	71.4	....	980
	½ Cotton seed meal			½ air	June 24		924	840	9 1	6.6	23.3	56.6	23.5	624
10	Mixed minerals	" 8	May 30	½ flue	July 1	1272	1288	1176	8.7	2.3	23.8	71.4	22.5	912
	1 Cotton seed meal			½ air	June 24		1260	1148	8.9	12.1	21.4	39.0	27.5	834
11	1 Cotton seed meal	" 8	June 2	½ flue	July 1	1064	1288	1120	12.9	5.0	32.5	60.0	2.5	840
	4 Sulphate potash			½ air	June 29		840	840	....	5.7	31.4	40.0	....	840
12	No manure	" 9	" 10	½ flue	June 1	658	728	728	....	....	19.5	73.0	....	728
				½ air	July 29		588	532	9.6	....	26.3	73.4	....	532

13	Mixed minerals 1½ Cotton seed meal	"	9	"	30	½ flue ½ air	July June	1 24	1120	1176 1064	1148 942	2.4 19.5	4.8 20.5	34.1 29.4	53.6 44.1	7.6 6.0	1062 1040
14	Mixed minerals 2 Cotton seed meal	"	9	"	30	½ flue ½ air	July June	1 24	1302	1484 1120	1440 952	2.3 15.0	2.0 20.5	42.0 29.4	52.0 44.1	4 0 6.0	1384 1052
15	Mixed minerals 1½ sulphate ammonia	"	9	"	30	½ flue ½ air	July June	1 24	718	1372 1064	1288 942	6.2 11.9	2.1	26.0 ...	60.8 17.6	11.1 82.4	948 196
16	Mixed minerals 2 sulphate ammonia	"	9	May	30	½ flue ½ air	July June	6 24	1190	1316 1064	†1176 924	18.2 13.2	2.3	38.0 15.1	52.3 15.1	7.4 69.8	1092 268
17	1 Sulphate ammonia 4 lbs Sulphate potash	"	9	June	1	½ flue ½ air	July June	1 29	966	1092 840	840 * 840	24.1	....	36.6 16.6	60.0 20.0	3.4 63.4	812 300
18	No manure	"	9	"	1	½ flue ½ air	July June	1 29	572	700 448	476 448	3.2	....	23.4 12.5	76.4 87.5	....	476 448

*Badly rotted. †Some rot.

PLAT 14. FERTILIZER EXPERIMENTS WITH TOBACCO.

No. of Experiment.	HOW FERTILIZED.	When Set.	When Topped.	Method of Curing.	When Harvested.	Yield Per Acre. Total.	Unfermented.	Fermented.	Per cent. Lost in Fermenting.	Per cent. Wrappers.	Per cent. Binders.	Per cent. Fillers.	Per cent. Lost in Assorting.	Lbs. Merchantable Tobacco.
1	Mixed minerals 1 Sulphate ammonia	April 7	June 30	½ flue ½ air	June 30 " 24	742	756 728	672 700	11.2 39.0	....	8.3 32.0	65.0 56.0	25.2 12.0	526 616
2	Mixed minerals 1 Dried blood	" 7	" 30	½ flue ½ air	" 30 " 24	967	980 952	924 924	5.8 3.0	3.0 12.1	12.1 21.0	66.6 37.5	18.3 9.4	745 838
3	Mixed minerals 1 Fish scrap	" 7	" 30	½ flue ½ air	" 30 " 24	1064	1148 980	1064 824	7.4 5.8	.... 15.1	13.1 33.3	68.4 48.4	18.5 3.2	868 896
4	Mixed minerals 1 Cotton seed meal	" 7	" 30	½ flue ½ air	" 30 " 24	1162	1344 980	1260 924	6.3 58.0	2.2 15.1	11.1 33.3	75.5 48.4	11.2 3.2	1129 871
5	Mixed minerals ½ Cotton seed meal	" 7	" 1	½ flue ½ air	" 30 " 24	700	756 644	756 560	.... 3.1	.... 5.0	21.3 40.0	69.2 50.0	9.5 5.0	756 532
6	No manure	" 7	May 30	½ flue ½ air	" 30 " 29	630	644 616	588 532	8.9 13.7	....	23.8 26 3	66.6 57.8	9.5 15.9	532 448
7	Nitrogen phosphate 1½ Kainite	" 7	" 30	½ flue ½ air	" 30 " 24	1176	1400 952	1148 896	18.0 5.9	... 6.2	7.7 25.0	36.5 46.8	55.8 22.0	508 704
8	Nitrogen phosphate 1 Kainite	" 7	" 30	½ flue ½ air	" 30 " 25	11900	1428 952	1148 896	19.7 5.9	.... 6.2	7.3 25.0	29.2 40.6	63.5 28.2	420 644
9	Nitrogen Phosphate ½ Muriate potash	" 7	" 30	½ flue ½ air	" 30 " 25	1176	1316 1036	1176 924	10.7 10.9	2.3 6.0	26.1 21.2	36.6 48.4	33.0 24.4	799 699
10	Nitrogen phosphate 1 Muriate potash	" 7	" 30	½ flue ½ air	" 30 " 25	1218	1400 1036	1120 952	20.0 9.2	2.5 5.8	... 23.5	45.0 47.0	52.5 23.7	665 737
11	Nitrogen phospbate	" 8	" 30	½ flue ½ air	" 30 " 25	1022	1176 868	1120 784	3.2 9.8	2.5 3.5	12.5 21.4	65.0 60.7	20.0 16.4	896 656
12	No manure	" 8	" 30	½ flue ½ air	" 30 " 29	588	672 504	644 420	4.2 16.7	....	8.6 2.6	69.5 60.0	22.9 37.4	497 264

13	Nitrogen phosphate ½ Sulphate potash	"	8	"	30	½ flue ½ air	"	30 25	994	1204 784	1148 728	4.7 7.4	7.3 19.2	26.8 30.7	60.3 50.5	5.0	1091 760
14	Nitrogen phosphate 1 Sulphate potash	"	8	"	30	½ flue ½ air	"	30 25	1078	1232 924	1120 840	9.1 9.1	12.5 13.3	30.0 30.0	57.5 56.6	....	1120 480
15	Nitrogen phosphate ½ Nitrate potash	"	13	"	30	½ flue ½ air	"	30 25	1008	1148 868	1008 768	12.8	11.1 17.6	27.7 23.5	61.2 32.3	.... 26.6	504 664
16	Nitrogen phosphate 1 Nitrate potash	"	13	"	30	½ flue ½ air	"	30 25	1088	1176 1000	980 952	16.7 4.8	14.2 29.4	31.4 26.4	55.4 38.2	.... 6.0	980 940
17	Nitrogen phosphate	"	8	"	30	½ flue ½ air	"	30 25	924	1120 728	952 672	13.7 7.7	2.4 4.1	32.3 20.7	64.7 75.1	....	952 672
18	No manure	"	8	"	30	½ flue ½ air	"	30 20	572	644 504	532 482	17.4 4.4	....	5.2 11.5	68.4 76.4	26.4 12.1	286 424

Despite the fact that there were nearly a quarter more plants to the experiment than the year previous, the yields of this year scarcely equal those of 1895, thus showing the drouth to have cut down yields nearly or quite one-quarter. While yet not as apparent as during 1895, these results still point towards nitrogen and phosphoric acid as the requirements. It is singular that though emphatically a potash loving plant, there is no indication of that substance having benefited tobacco on this soil.

In order to test the question of how much fertilizer could be applied to tobacco on this soil with profit, plat 4 was planted with tobacco and quantities of C. S. meal, varying from one to two thousand—phosphate from 500 to 1000 and potash from 100 to 200 pounds per acre, were applied with the following results:

PLAT 4. QUANTITY TEST.

No of Experiment.	HOW FERTILIZED PER ACRE.	When Set.	When Topped.	Method of Curing.	When Harvested.	Yield Per Acre. Total.	Unfermented.	Fermented.	Per cent. Lost in Fermenting.	Per cent. Wrappers.	Per cent. Binders.	Per cent. Fillers.	Per cent. Lost in Assorting.	Lbs Mercantable Tobacco.	Total Yield of Experiment per acre.
1	1000 lbs cotton seed meal..... 500 lbs acid phosphate..... 100 lbs sulphate potash.....	April 13	June 8	¼ stick air ¾ stalk air	July 2	1328	1530 1258	1326 1156	19.4 8.2	23.2 17.6	23.8 29.4	23.8 31.7	29.2 29.3	838 818	820
2	1250 lbs cotton seed meal..... 625 lbs acid phosphate..... 125 lbs sulphate potash.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1275	1352 1282	1122 1156	17.8 9.9	9.9 20.5	30.9 35.2	36.3 29.4	24.7 14.9	945 984	974
3	1500 lbs cotton seed meal..... 750 lbs acid phosphate..... 150 lbs sulphate potash.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1275	1560 1190	1326 1088	18.9 8.6	23.2 21.8	30.0 34.2	30.9 29.7	15.9 14.3	1141 933	984
4	1750 lbs cotton seed meal..... 875 lbs acid phosphate..... 175 lbs sulphate potash.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1351	1456 1351	1224 1190	16.0 11.1	16.6 22.8	34.3 37.1	29.1 34.2	21.0 5.9	967 1120	1081
5	2000 lbs cotton seed meal..... 1000 lbs acid phosphate..... 200 lbs sulphate potash.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1377	1560 1351	1122 1156	28.2 14.5	18.1 23.5	45.4 38.2	36.3 38.3	....	1122 1156	1147
6	No manure.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1071	1248 1039	1020 952	14.5 9.0	5.0 5.3	40.0 35.7	45.0 50.0	10.0 9.0	918 946	836
7	2000 lbs cotton seed meal ..... 1000 lbs acid phosphate.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1377	1456 1386	1224 1292	8.4 6.8	12.5 17.1	33.3 42.1	37.5 39.4	16.7 1.4	1024 1274	1221
8	2000 lbs cotton seed meal..... 200 lbs sulphate potash.....	" 13	" 8	¼ stick air ¾ stalk air	" 2	1504	1632 1462	1326 1122	18.8 2.33	19.2 21.2	38.4 42.4	30.7 30.3	12.7 6.1	1261 1054	1104

Again the drouth interfered with results, the figures simply showing that the fertilizers have increased the yield, but tell nothing in regard to how much tobacco can be grown, as these results scarcely equal those of the ordinary experiments of 1895. However, this table serves one purpose in illustrating the effect of fertility on the per cent. of wrappers. It will be noticed that the per cent. of wrappers in all experiments except the "nothing" is greater than in any of the former experiments. It is to be hoped that the work of the present year will give more definite information on the above points.

CURING.

As in 1895 three methods of curing were tried. The Snow barn or heat cure, curing in the air on the stalk, and curing the leaf, on the Snow sticks in the air. In publishing these results in 1895 the suspicion was aroused that the leaf process of curing gave greater yield of tobacco than when the leaves were cured on the stalk. No precautions had been taken to settle this unsuspected difference, hence the question was allowed to remain in abeyance until 1896. This year due precautions were taken. In all three plats of the fertilizer tests the experiments consisted of four rows. In the cases of plats 13 and 14, rows 1 and 3 were cured by flue, while 2 and 4 followed the ordinary method of stalk cure. In plat 4, row 1 was cured by the stick air process and 2 and 4 as in the former case. An examination of these tables (plats 4, 13 and 14) will show that in every instance where the leaves were removed from the stalk the yield of cured tobacco was greater than when cured on the stalk. On the other hand it will be noticed that the percentage of wrappers was much greater, averaging nearly doubly where stalk curing was used as compared with flue curing.

Nor does this represent the whole difference, for these wrappers were of far better quality than those resulting from the flue process.

In comparing the stick air with stalk air this latter difference is not so perceptable, (see plat 4.) Again, the percetages of wrappers were not so widely separated, and the equality was nearly or quite the same. Judging from our two years' experience,

it becomes rather doubtful whether we can ever cure cigar tobaccos satisfactorily by the Snow process. In order to even make a semblance of success the time of curing has been extended to at least 15 days. This of itself largely does away with the economy of space for which the Snow curing is especially recommended. On the other hand the resultant tobacco has been of much poorer quality. In fermentation the tobacco from this process retained a peculiar disagreeable odor which very largely unfits it for cigar use.

In the case of the stick air process the result is different, it being impossible to tell this tobacco from that cured on the stalk. This process possesses all the advantages of the flue and is destined to play no small part in tobacco economics.

FERMENTATION.

The crop of 1895 was not cased down until late in the fall. When this was done it was found necessary to re-moisten it. The cool weather of winter prevented fermentation and it was late in the summer of '96 and only after repeated moistenings that we were enabled to induce fermentation. With the crop of 1896 this error was avoided. As soon as cured the tobacco was packed into cases. Fermentation immediately ensued and by October 15th was completed. The cases were then opened the leaves assorted and re cased preparatory for shipment. To the fact that the tobacco was assorted after fermentation is due a portion of the decreased yield of wrappers over the crop or 1895.

GENERAL REMARKS.

When bulletin No. 41, giving the results of tobacco experiments was published, this station was unable to state anything positive in regard to quality of the tobacco. Since then the crop was shipped to L. O. Courseault, an expert cigar maker, of Convent, La., who worked it up into cigars. These cigars were on exhibition during the recent meeting of the State Agricultural Society and were pronounced by all of excellent quality. The two subjoined letters are out of many of a like character received by Mr. Courseault and the station.

BATON ROUGE, LA., January 23, 1897.

Mr. D N. Barrow, Experiment Station, Baton Rouge, La.:

MY DEAR SIR—I thank you for the sample of cigars, made, as you tell me, from tobacco grown here on the Experiment Farm, and I wish to say that I find them excellent in workmanship, with a wrapper comparing favorably with the best imported; a long filler equal, when smoked, in fragrance to many of the leading brands of Havana cigars now on the market. The only objection I can find is that the tobacco is a little too fresh and green. I mean, the cigars after they are made up should become well cured, for sixty or ninety days, before placing them on the market, and perhaps the tobacco itself should remain longer in the leaf. If you can grow this tobacco, with wrapper and filler, in sufficient quantity to make it pay per acre, I can see no reason why it should not become a leading crop and prove a source of great profit to our farmers whose only road to independence is in the diversity of their crops, so that if one fails, the other averages up the profit. Wishing you succes, I remain yours truly, C. J. BARROW,

Manager Baton Rouge Liquor and Cigar Co.

FORT WORTH, TEXAS, Jan. 23, 1897.

Mr. David N. Barrow, Assistant Director, State Experiment Station, Baton Rouge, La.:

DEAR SIR—I am in receipt of your favor of the 21st inst., also a sample of cigars manufactured from tobacco grown at the State Experiment Station, and will say that after carefully smoking some of the cigars I find that they are excellent in flavor and a superior cigar, considering the fact that the leaf is only six months old. I will venture to say that with eighteen months or two years age they would compare favorably with Havana goods. Very truly yours, S. MIMS,

Secretary Texas & Pacific Coal Company.

The following is the report on the tobacco made by Mr. Courseault to the State Agricultural Society :

PARISH OF ST. JAMES, LA., January 25, 1897.

To the Louisiana State Agricultural Society, Baton Rouge, La.

GENTLEMEN—Having been selected by the Experiment Station of this State, as a proper person to manufacture and test the tobacco grown by it in this State, and to convert it into cigars, I most respectfully beg leave to submit to your honorable body, this my report, as follows:

I have carefully tested and manufactured this tobacco and found it good in every respect and capable of standing all the different processess through which it has to go in its preparation for cigars. The cigars I have made of it have a very fine flavor, a good taste, and very agreeable to the smoker, by reason of the fact that in smoking them, as they are consumed, there is no bad taste to the smoker, but on the contrary they are very agreeable all through, and their qualities are what the smoker and the trade require.

The wrappers, especially the spotted ones, are equal to the Sumatra wrappers, and as for the non spotted wrappers, they are equal, if not superior, to any first class wrappers in the market. My opinion is that this tobacco, for cigar use, is far above the average of tobacco grown in other States in the Union, in quality.

In making this report I deem it my duty to congratulate the Experiment Station, and the State of Louisiana at large, upon the successful raising of tobacco in this State, which proves a success for manufacturing and being converted into cigars, and which would satisfy the most skeptical that this industry, if continued, will be fully abreast in a short time, with any of the other tobacco growing States in the Union.

I am most respectfully yours,

L O COURSEAULT.

After such evidence the Station has no hesitancy in asserting that our bluff lands are capable of raising cigar tobacco of no small degree of excellence. Like all new industries, there might at first be some difficulty in disposing of the product, hence we advise the starting with small patches in order not to be over-

stocked and also to learn the business. If our farmers will now take hold and push this industry, the day will not be far distant when the tobacco buyer and tobacco warehouse will be as common here as in Connecticut. The wrappers raised here are worth between 15 to 25 cents per pound. The binders 10 cents, and fillers 5 to 6 cents. With even these values tobacco cannot well fail to be a paying crop, and we flatter ourselves that it will be possible in the near future to produce even more valuable leaves.