TEXAS AGRICULTURAL EXPERIMENT STATIONS.

BULLETIN No. 45.

DECEMBER, 1897.

COTTON EXPERIMENTS

FERTILIZERS.
VARIETIES.
DISTANCE.

CORN EXPERIMENTS.

POSTOFFICE:
COLLEGE STATION, BRAZOS CO., TEXAS.

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J. H. CONNELL, DIRECTOR, P. O. College Station, Texas.

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NOTE.—*The main station is located on the grounds of the Agricultural and Mechanical College in Brazos County. The postoffice address is College Station, Texas.*

COTTON AND CORN EXPERIMENTS—1897.

BY B. C. PITTUCK.

The following field experiments were carried on at this Station during the season of 1897:

1. A "variety and distance" test on cotton. Five varieties (Bohemian, Jones' Improved, Welborn's Pet, Peterkin Limbed Cluster, and Texas Oak) were used, the distance varying from 3x2 feet to 4x3 feet.

2. A "Fertilizer" test on cotton. One variety (Bohemian) was used, and planted in four-foot rows and two feet between hills. Varying forms and amounts of the elements nitrogen, phosphoric acid and potash were applied.

3. A "Fertilizer" test on corn. One variety (Golden Beauty — a Northern grown seed corn purchased of a Southern seed house) was used. Fertilizers in various forms and amounts were applied, both singly and in combination.

I.

Bohemian, Welborn's Pet and Peterkin Limbed Cluster made largest yields when planted in three-foot rows and two feet in the drill; Texas Oak, four-foot rows and two feet in the drill; Jones' Improved, four-foot rows and three feet in the drill.

II.

The largest individual yield (738.5 lbs. seed lint) in cotton fertilizer test was given by a single application of phosphoric acid in the form of bone black, at the rate of 500 pounds per acre. Of the nitrogenous fertilizers, cotton seed meal at the rate of 500 pounds per acre, gave the largest yield—711.6 pounds seed lint. Of the potash fertilizers, cotton seed hull ashes, at the rate of 500 pounds per acre, gave the largest yield—670.1 pounds seed lint. Of the complete fertilizers, acid phosphate, 200 pounds per acre, and stable manure, 4000 pounds per acre, gave the largest yield—665.5 pounds seed lint.

III.

The largest individual yield (37.2 bushels) in corn fertilizer test was given by a single application of phosphoric acid applied at the rate of 500 pounds per acre.

Of the nitrogenous fertilizers, stable manure, at the rate of 4000 pounds per acre, gave the largest yield—27.7 bushels.

Of the potash fertilizers, cotton seed hull ashes, at the rate of 500 pounds per acre, gave the largest yield—24.8 bushels.

Of the complete fertilizers, kainit, 100 pounds; acid phosphate, 400 pounds; muriate of potash, 150 pounds; gave largest yield—26.6 bushels.

EXPERIMENTS WITH COTTON.

The tables on pages 993 and 994 give the farmer a clear insight into the seasons during the year. It will be noticed by consulting the meteorological table, No. 1, that we had a heavy rain on January 2d, followed by light showers on the 3d instant. On the 8th instant, subsoiling was begun, the ground being still wet from previous rains. The breaking and subsoiling was exceedingly difficult, and continued until the 19th instant. In this land, the subsoiler was run to a depth of fourteen inches. The field was laid off into one-tenth acre plots, with four-foot space between each. On April 7th all plots were harrowed with spring-tooth harrow, and planted by hand, and covered to a depth of three and a half inches with a small turning plow. This left a balk of twelve inches between the ridges, which gave ample room for free circulation of air. The stiff norther of April 8th, and dry conditions of surface soil which followed, caused us to pack these ridges by rolling a heavy two-horse roller over them. This was done to favor germination by drawing a supply of water from below and increasing the capillary attraction of the surface soil. April 12th, these ridges were torn down with an Orric harrow and middles split with wide sweeps, leaving the seed about an inch and a half beneath the surface. The cool rain of April 14th chilled the soil so much that germination, which took place on April 17th, was poor and slow. Cultivation: May 3d, double sweeps were run around; May 13th, cotton chopped and thinned—Bohemian and Wellborn's Pet left two stalks to the hill; this was followed with single sweeps running around and splitting the middles; June 3d, hoed; June 11th, run around with sweeps, leaving middles; June 15th, middles run out; June 28th, hoed.

The preparation and cultivation given above applies to both "variety and distance" and fertilizer tests with cotton. All cultivation was shallow, just deep enough to leave a loose layer of earth on the surface to prevent the too rapid evaporation of moisture.

Seed used in these experiments were procured as follows:

Bohemian—Simons, College Station.

Welborn's Pet—Jeff Welborn, Lonoak, Ark.

Jones' Improved—J. F. Jones, Hogansville, Ga.

Peterkin, L. C.—Alexander Drug and Seed Co., Augusta, Ga.

Texas Oak—M. G. Smith, Lightfoot, Ga.

VARIETY AND DISTANCE TESTS.

The question of the proper distance between the rows and in the drills to plant cotton has at some time agitated the mind of every farmer in the State. Each and every one has his ideas on the subject, and advocates the distance he thinks best suited to his locality. Experiments have been carried on at several of the Stations in this line, and the general results favor four-foot rows and two feet apart in the drill. Different varieties require different distances for best results, also varying according to the character of the soil. In view of the fact that this mooted question has not been tested in our State by an experiment station, an experiment was instituted, including three groups of five varieties each. The distances planted was 3x2, 4x2, and 4x3. The following table gives variety, distance, pickings, yield seed lint, per cent lint, per cent seed, total lint and seed, and value of crop at market price:

Varieties and Distance—Cotton.

	Plot.	Variety.	Distance planted.	Depth prepared.	First picking.		Second picking.		Third picking.		Fourth picking.		Fifth picking.		Total seed cotton.	Per cent lint.	Per cent seed.	Total lint.	Total seed.	Value of yield seed lint at 2c.	Gain or loss over check plots.	Gain or loss over average of all check plots.
					Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.								
Thick stand.	1	*Bohemian (check)	3x2 ft	14 inch.	147.8	Aug. 6	306.4	Aug. 31	86	Sept. 24	314.5	Dec. 11	115.1	Jan. 10	*970.3*	*33.12*	*65.62*	*321.3*	*636.7*	*$19.40*		
	2	Jones' Improved	...do.	...do....	199.4	Aug. 6	224.7	Aug. 31	67.4	...do.....	202.2	...do.....	.....	.....	693.7	31.38	63.88	217.6	443.1	13.87	$-2.52	$-1.58
	3	*Welborn's Pet	...do.	...do....	129	Aug. 3	161.2	Aug. 9	150.5	Aug. 31	48.3	Sept. 24	239.2	Dec. 11	728.2	32.58	67.41	237.2	490.8	14.56	-1.81	-.89
	4	Peterkin Limbed Cluster	...do.	...do....	144.2	Aug. 6	310.8	Aug. 31	76.9	Sept. 24	166.6	Dec. 11	108.9	Jan. 10	806.8	36.47	61.64	294.2	497.3	16.13	-.24	0.86
	5	Texas Oak	...do.	...do....	217.3	Aug. 6	184.7	...do.....	70.6	...do.....	97.8	...do.....	76.1	...do.....	546.5	37.50	61.87	204.9	338.1	10.93	-5.34	-4.52
Medium stand.	6	*Bohemian (check)	4x2 ft	...do....	100.6	Aug. 6	298.7	...do.....	100.6	...do.....	82.3	...do.....	85.3	...do.....	*667.5*	*32.72*	*66.10*	*218.4*	*441.2*	*13.35*		
	7	Jones' Improved	...do.	...do....	179	Aug. 6	283.9	...do.....	95.6	...do.....	123.4	...do.....	.....	.....	681.9	30.00	65.00	204.5	443.2	13.63	0.15	-1.82
	8	*Welborn's Pet	...do.	...do....	135.2	Aug. 3	161.7	Aug. 9	164.7	Aug. 31	52.9	Sept. 24	176.4	Dec. 11	690.9	31.66	67.33	218.7	465.1	13.81	0.33	-1.64
	9	Peterkin Limbed Cluster	...do.	...do....	153.1	Aug. 6	306.2	Aug. 31	68.7	Sept. 24	121.8	Dec. 11	62.5	Jan. 10	712.3	30.76	61.53	219.1	438.2	14.24	0.76	-1.21
	10	Texas Oak	...do.	...do....	222.2	Aug. 6	209.8	...do.....	74	...do.....	70.9	...do.....	37	...do.....	613.9	34.78	60.86	213.5	373.6	12.27	-1.21	-3.18
Thin stand.	11	*Bohemian (check)	4x3 ft	...do....	101.1	Aug. 6	312.5	...do.....	119	...do.....	107.1	...do.....	41.6	...do.....	*681.3*	*30.55*	*62.77*	*208.1*	*427.6*	*13.62*		
	12	Jones' Improved	...do.	...do....	256	Aug. 6	371.9	...do.....	106.7	...do.....	128	...do.....	.....	.....	862.6	31.68	61.81	273.2	533.1	17.24	3.62	1.79
	13	*Welborn's Pet	...do.	...do....	78.4	Aug. 3	153.4	Aug. 9	227.2	Aug. 31	68.1	Sept. 24	181.8	Dec. 11	708.9	30.64	68.06	217.2	482.4	14.16	0.54	-1.29
	14	Peterkin Limbed Cluster	...do.	...do....	51.4	Aug. 6	279.2	Aug. 31	169.1	Sept. 24	106.6	Dec. 11	36.7	Jan. 10	643.0	31.33	62.06	201.4	399.0	12.86	0.76	-2.59
	15	Texas Oak	...do.	...do....	145.5	Aug. 6	177.2	...do.....	88.6	...do.....	101.2	...do.....	25.3	...do.....	537.8	34.37	64.37	184.8	346.1	10.74	-2.88	-4.71

* Two stalks left in each hill.

Bohemian was used as "check" to compare the yield of varieties. To simplify the above table, we have extracted the yields of seed lint and lint and compare them by groups. Group No. 1, planted in rows three feet apart and two feet in the drill; Group No. 2, rows four feet apart and two feet in the drill; Group No. 3, rows four feet apart and three feet in the drill:

	Group No. 1.		Group No. 2.		Group No. 3.	
	3 x 2 ft. rows.		4 x 2 rows.		4 x 3 rows.	
	Seed lint.	Lint.	Seed lint.	Lint.	Seed lint.	Lint.
Bohemian (check)	970.3	321.3	667.5	218.4	681.3	208.1
Jones' Improved	693.7	217.6	681.9	204.5	862.6	273.2
Welborn's Pet	728.2	237.2	690.9	218.7	708.9	217.2
Peterkin, L. C	806.8	294.2	712.3	219.1	643.0	201.4
Texas Oak	546.5	204.9	613.9	213.5	537.8	184.8

Results.—In this table, two comparisons can be made: 1st, as to distance of planting as best suited to each variety; 2d, comparison of varieties as to yield.

1. Bohemian gave largest yield in Group No. 1, while Group No. 3 gave larger yield than Group No. 2.

Jones' Improved gave largest yield in Group No. 3, while Group No. 1 gave larger yield than Group No. 2.

Welborn's Pet gave largest yield in Group No. 1, while Group No. 3 gave larger yield than Group No. 2.

Peterkin Limbed Cluster gave largest yield in Group No. 1, while Group No. 2 gave larger yield than Group No. 3.

Texas Oak gave largest yield in Group No. 2, while Group No. 1 gave larger yield than Group No. 3.

This work is not in any way comparable with previous work at this Station, and the results as obtained are liable to be reversed by another season's work. The actual difference in yield in each case varying with the distance does not warrant any conclusions to be drawn from this season's work. The experiment will be continued next season, the results of which, compiled with the above and compared, will allow us to draw safe conclusions in regard to best distance suited to each of the above varieties.

2. Bohemian gave largest yield (970.3 pounds seed lint), in Group No. 1.

Peterkin Limbed Cluster gave largest yield (712.3 pounds seed lint), in Group No. 2.

Jones' Improved gave largest yield (862.6 pounds seed lint), in Group No. 3.

FERTILIZER TEST: COTTON.

The laws laid down by Liebig as the principles underlying the use of commercial fertilizers are as follows:

"1st. A soil can be termed fertile only when it contains all the material requisite for the nutrition of plants in the required quantity and in the required form. 2d. With every crop, a portion of these ingredients is moved. A part of this portion is added again from the inexhaustable store of the atmosphere; another part, however, is lost forever if not replaced by man. 3d. The fertility of the soil remains unchanged if all the ingredients of a crop are given back to the land. Such a restitution is effected by manure. 4th. The manure produced in the course of husbandry is not sufficient to maintain permanently the fertility of the farm. It lacks the constituents which are annually exported in the shape of grain, hay, milk and live stock."

By glancing at the chemical and mechanical analyses of our soil as given on pages 990 and 991, we readily see that it lacks the requirements of a fertile soil, both chemically and physically. Of the fourteen elements necessary to plant growth, nitrogen, phosphorous and potash are the costliest to apply in the form of commercial fertilizers and the easiest exhausted by continuous croppings. Of these, we find two deficient in our soil. Considering these facts, it gives us three conditions to meet. To restore the soil fertility it is necessary that phosphoric acid and potash be applied in the proper forms and the required amounts; also, that humus be added to aid in bettering the mechanical condition. As we find different forms of the above elements, so do we have different methods of procedure in producing humus in the soil.

Deep plowing in the first place is a mechanical renovator; other effects than this must be derived by the use of commercial fertilizers. The restoring of these three conditions is governed mainly by the cost of methods or form or fertilizer. Hence, the following tests of different applications to cotton. The three elements, nitrogen, phosphorous and potash, were applied both singly and combined:

Fertilizer Test—Cotton.

Plot No.	Fertilizers applied per acre. Bohemian—(4x2 feet.)	First Picking.		Second Picking.		Third Picking.		Fourth picking.		Total seed cotton.	Per cent of lint.	Per cent of seed.	Total yield of lint.	Total yield of seed.	Value of seed lint at 2 cts. per pound.	Cost of fertilizer per acre.	Total value of crop less fertilizer.
		Amt.	Date.	Amt.	Date.	Amt.	Date.	Amt.	Date.								
22	(Check)—No manure	379.4	Aug. 31	100.	Sept.24	200.	Dec. 11	.....	.....	*679.4*	*30.58*	*65.88*	*207.7*	*447.5*	*$13 58*	.....	*$13 58*
23	300 pounds Kainit in subsoil furrow; 300 pounds surface application.	347.2	...do.....	215.2	...do.....	114.5	...do.....	.....	.....	676.9	32.43	64.86	219.5	439.0	13 53	$4 42	9 11
24	500 pounds Lime in subsoil furrow; 500 pounds surface application.	193.1	...do.....	241.4	...do.....	125.	...do.....	.....	.....	559.5	29.54	65.46	165.2	366.2	11 19	6 66	4 53
25	2000 pounds Wood Ashes; 400 pounds C. S. Meal; 300 pounds Acid Phosphate.	434.5	...do.....	104.1	...do.....	116.	...do.....	.....	.....	654.6	29.74	67.69	194.6	443.0	13 09	6 25	6 84
26	100 pounds Kainit; 400 pounds Acid Phosphate; 150 pounds Nitrate Soda.	365.8	...do.....	64.	...do.....	149.3	...do.....	.....	.....	579.1	32.65	66.53	189.0	385.2	11 58	8 60	2 98
32	(Check)—No manure	94.4	Aug. 6	272.2	Aug. 31	94.4	Sept.24	180.5	Dec. 11	*641.5*	*32.30*	*65.84*	*207.2*	*422.3*	*12 83*	.....	*12 83*
33	2000 pounds Wood Ashes	181.3	...do.....	285.7	...do.....	63.2	...do.....	126.4	...do.....	656.6	29.13	68.26	191.2	448.1	13 13	1 00	12 13
34	200 pounds Muriate of Potash	144.	...do.....	277.1	...do.....	54.3	...do.....	108.7	...do.....	584.1	32.50	66.50	189.8	388.4	11 68	6 00	5 68
35	500 pounds Acid Phosphate	292.1	...do.....	179.7	...do.....	57.2	...do.....	144.	...do.....	673.0	31.11	67.40	209.3	453.6	13 46	3 75	9 71
36	200 pounds Acid Phosphate; 4000 pounds Stable Manure.	255.8	...do.....	235.4	...do.....	58.1	...do.....	116.2	...do.....	665.5	31.50	67.50	209.6	449.2	13 31	2 50	10 81
37	300 pounds Nitrate of Soda	113.6	...do.....	346.5	...do.....	102.2	...do.....	93.7	...do.....	656.0	33.33	61.81	218.6	405.4	13 12	9 75	3 37
38	4000 pounds Stable Manure	208.3	...do.....	208.3	...do.....	52.	...do.....	145.7	...do.....	614.3	32.14	63.21	197.4	388.2	12 28	1 00	11 28
39	500 pounds Cotton Seed Hull Ashes	206.	...do.....	241.7	...do.....	54.9	...do.....	167.5	...do.....	670.1	32.78	66.55	219.6	445.9	13 40	1 25	12 15
40	500 pounds Bone Black	244.3	...do.....	261.3	...do.....	65.3	...do.....	167.6	...do.....	738.5	30.88	66.10	228.0	488.1	14 77	5 00	9 77
41	500 pounds Bone Meal	314.5	...do.....	215.	...do.....	26.8	...do.....	120.5	...do.....	676.8	32.44	66.66	219.5	451.1	13 53	5.75	7 78
42	325 pounds Bat Guano	219.7	...do.....	236.2	...do.....	46.7	...do.....	151.	...do.....	653.6	33.09	66.10	216.2	432.0	13 07	.....	.....
43	Cotton planted broadcast; no cultivation given	180.	...do.....	95.	...do.....	.....	...do.....	.....	...do.....	275.0	32.63	64.73	89.7	178.0	5.50	25	5.25
44	500 pounds C. S. Meal	186.8	...do.....	197.8	...do.....	57.6	...do.....	269.2	...do.....	711.6	31.63	66.73	225.0	474.8	14 23	3 75	10 48

Results.—The fertilizer applications, as given in the above table, may be divided into four classes, as follows:

1. Nitrogenous.
2. Phosphatic.
3. Potash.
4. Compound (either two or all three of the above).

The following gives yield seed lint per acre for each form of fertilizer applied, valued at 2 cents per pound, and increase in yield of seed lint and lint above check plot:

NITROGENOUS.

Nitrate of Soda—Yield seed lint per acre, 656 pounds; value of seed lint at 2 cents, $13.12; increase in yield of seed lint above check plot, 14.5 pounds; lint, 11.4 pounds.

Stable Manure—Yield seed lint per acre, 614.3 pounds; value of seed lint at 2 cents, $12.28; decrease in yield of seed lint below check plot, 27.2 pounds; lint, 9.8 pounds.

Bat Guano—Yield seed lint per acre, 653.6 pounds; value of seed lint at 2 cents, $13.07; increase in yield of seed lint above check plot, 12.1 pounds; lint, 9 pounds.

Cotton Seed Meal—Yield seed lint per acre, 711.16 pounds; value of seed lint at 2 cents, $14.23; increase in yield of seed lint above check plot, 70.1 pounds; lint, 17.8 pounds.

PHOSPHATIC.

Acid Phosphate—Yield seed lint per acre, 673 pounds; value of seed lint at 2 cents, $13.46; increase in yield of seed lint above check plot, 31.5 pounds; lint, 2.1 pounds.

Bone Black—Yield seed lint per acre, 738.5 pounds; value of seed lint at 2 cents, $14.77; increase in yield of seed lint above check plot, 97 pounds; lint, 20.8 pounds.

Bone Meal—Yield seed lint per acre, 676.8 pounds; value of seed lint at 2 cents, $13.53; increase in yield of seed lint above check plot, 35.3 pounds; lint, 12.3 pounds.

POTASH.

Kainit—Yield seed lint per acre, 676.9 pounds; value of seed lint at 2 cents, $13.53; increase in yield of seed lint above check plot, 16.5 pounds; lint, 12.1 pounds.

Wood Ashes—Yield seed lint per acre, 656.6 pounds; value of seed lint at 2 cents, $13.13; increase in yield of seed lint above check plot, 15.1 pounds; lint, -16 pounds.

Muriate of Potash—Yield seed lint per acre, 584.1 pounds; value of seed lint at 2 cents, $11.68; decrease in yield of seed lint below check plot, 57.4 pounds; lint, 17.4 pounds.

COMBINATIONS.

Cotton Seed Hull Ashes—Yield seed lint per acre, 670.1 pounds; value of seed lint at 2 cents, $13.40; increase in yield of seed lint above check plot, 28.6 pounds; lint, 12.4 pounds.

Wood Ashes, Cotton Seed Meal, Acid Phosphate—Yield seed lint per acre, 654.6 pounds; value of seed lint at 2 cents, $13.09; decrease in yield of seed lint below check plot, 5.8 pounds; lint, 12.8 pounds.

Kainit, Acid Phosphate, and Nitrate of Soda—Yield seed lint per acre, 579.1 pounds; value of seed lint at 2 cents, $11.58; decrease in yield of seed lint below check plot, 81.3 pounds; lint, 18.4 pounds.

Acid Phosphate, Stable Manure—Yield seed lint per acre, 665.5 pounds; value of seed lint at 2 cents, $13.31; increase in yield of seed lint above check plot, 24 pounds; lint, 2.4 pounds.

Lime used to better the physical condition, and to act as a supplement to the soil elements, decreases the yield of seed lint below check plot 100.9 pounds; lint, 42.2 pounds; value of seed lint at 2 cents, $11.19.

By a careful examination of the above groups as to yield, it is evident that a single application of phosphatic fertilizers give best results. Of the potash fertilizers, cotton seed hull ashes and kainit increase the yield slightly. Of the nitrogenous fertilizers, cotton seed meal alone gives an appreciable increase in yield. Of the compound and complete fertilizers, acid phosphate and stable manure gave a small increase.

The actual effect of each fertilizer on the yield of cotton can not be intelligently understood by considering the results of one year's work. The fact that the small gains and losses in yield on each plot is due to the special application it receives might be proven erroneous by a repetition of the test during next season. For this reason we simply state the facts, and leave the conclusions for further consideration during the coming year.

CHARACTER OF STAPLE.

A sample of lint was taken as the yield from each plot was ginned — varieties and fertilizer plots. These samples were forwarded to Messrs. Slayden, Clarkson & Robards of Houston. The following classifications correspond with the plot from which the sample was taken:

1. American strict middling, slightly sandy, 1 1-16 inch staple, strong; spinning qualities good.—Bohemian.
2. American middling, 1 1-16 inch staple, soft; spinning qualities only fair.—Jones' Improved.
3. American strict middling, 1 inch staple, soft; spinning qualities poor.—Welborn's Pet.
4. American middling, 1 inch staple, soft and wasty; spinning qualities bad on account of waste.—Peterkin Limbed Cluster.
5. American strict middling, 1-2 inch staple, soft; spinning qualities poor.—Texas Oak.
7. American good middling, 1 1-8 inch staple, strong; spinning qualities good, very little waste.—Jones' Improved.

8. American middling, 1-2 inch staple, very wasty; spinning qualities bad.—Welborn's Pet.
9. American strict middling, 1 1-16 inch staple, strong; spinning qualities good.—Peterkin Limbed Cluster.
10. American good middling, 1 inch staple, soft; spinning qualities poor.—Texas Oak.
11. American middling, slightly sandy, 1 1-8 inch staple; spinning qualities good.—Bohemian.
12. American strict middling, 1 1-8 inch staple, strong; spinning qualities good.—Jones' Improved.
13. American middling, 1 inch staple, strong; spinning qualities good.—Welborn's Pet.
14. American strict middling, 1 1-8 inch staple, strong; spinning qualities good.—Peterkin Limbed Cluster.
15. American strict middling, 1 inch staple, strong; spinning qualities good.—Texas Oak.
22. American middling, 1-2 inch staple; spinning qualities very poor.—Bohemian (check).
23. American middling, 1 1-8 inch staple, strong; spinning qualities good.—Potash (Kainit).
24. American middling, 1 1-8 inch staple, strong; spinning qualities good.—Lime.
25. American middling, 1 1-8 inch staple, strong; spinning qualities very good.—Potash, nitrogen, phosphoric acid.
26. American middling, 1 1-8 inch staple; spinning qualities good.—Nitrogen, phosphoric acid, potash.
32. American strict low middling, 1 inch staple, strong; sandy, making it objectionable to spinners.—Bohemian (check).
33. American strict middling, 1 inch staple, strong; spinning qualities good.—Potash (wood ashes).
34. American middling, 1 1-16 inch staple, strong; spinning qualities good.—Potash (Muriate K O).
35. American good middling, 1 1-8 inch staple, strong; spinning qualities fine.—Acid phosphate.
36. American strict middling, 1 1-8 inch staple, strong; spinning qualities fine.—Nitrogen, and acid phosphate.
37. American strict low middling, sandy, 1 inch staple, soft; spinning qualities poor.—Nitrogen, nitrate soda.
38. American middling, 1 1-8 inch staple, strong; spinning qualities good.—Nitrogen (stable manure).
39. American strict middling, 3-4 inch staple, soft; spinning qualities poor.—Potash, cotton seed hull ashes.
40. American strict middling, 1 1-16 inch staple, soft; spinning qualities fair.—Phosphoric acid (bone black).
41. American good middling, 1 1-16 inch staple, soft; spinning qualities fairly good.—Phosphoric acid (bone meal).
42. American middling, 1 1-8 inch staple, strong, slightly sandy; spinning qualities good.—Nitrogen (bat guano).
43. American strict low middling, 1 inch staple, strong; spinning qualities good.
44. American strict middling, 1 1-8 inch staple, strong; spinning qualities good.—Nitrogen (cotton seed meal).

FERTILIZER EXPERIMENT ON CORN.

The land used in this test received identically the same preparation as land used for cotton; also, fertilizer applications on same date. Northern grown corn, purchased of Texas Seed and Floral Co., of Dallas, Texas—Golden Beauty—was used on all corn plots. Land harrowed and planted March 4th, using check row planter; rows three feet eight inches, and two and a half feet apart in the drill. All plots germinated evenly on March 10th. The cultivation consisted of harrowing with smoothing harrow March 26th, running around and breaking middles with single sweeps on April 6th; hoed and thinned April 23d; plowed with Victor riding cultivator April 24th; plowed with double shovel May 3d, which completed the cultivation.

We would naturally infer, from the chemical analyses given, that our soil would respond eagerly to the application of the two elements—phosphoric acid, and potash. Though only a minimum amount of potash is found in our soil, the application of this element gives no increase in yield. One of two conclusions are left us in this regard: 1st, The availability of the potash as applied is hindered by some peculiarity in the soil; 2d, The potash already in the soil is so readily available that any application of that element is superfluous to the needs of plant growth and development. The latter conclusion seems most probable, as the potash applications were in a readily available form.

On the other hand, plant growth responds eagerly to applications of phosphoric acid in any form. The effect is readily noticeable when applied singly or in combination, though the single application of readily available phosphoric acid gives best results. The quickness of growth, color and vitality of the young plant distinguished this group from all others by the time the corn was fifteen days old, and was easily separated to the time of maturity.

The reader must understand that such conditions as are shown to exist here are not applicable in every sense to other soil conditions. While our soil fails to respond to applications of potash, other soils deficient in this element may show a marked increase in productiveness by its application.

Nitrogen, in the form of stable manure, gave an increase over check plots.

The cost of fertilizers is evidently a great item to be considered in their application. The cheapest forms are not always the best, neither are the costliest the best. From the above, we readily see that our best results were obtained by the use of phosphoric acid in its different forms. But these forms vary in price, and not in proportion with the increased yields. Acid phosphate, with about 15 per cent phosphoric acid, costing $3.75 per acre as applied (500 pounds), gives an increase in yield that pays for the fertilizer and leaves $1.45 to its profit. Bone meal, with about 21 per cent phosphoric acid, and bone black, with about 30 per cent phosphoric acid, costing $5 and $5.75 per acre as applied (500 pounds in each case), respectively, do not increase the yield sufficiently above check plots to pay cost of fertilizer. Therefore, the loss is estimated at $4.32 and $3.51 per acre. Other fertilizers, not making the same yields as bone

black and bone meal, gave better returns over the first year's cost, but the increase the following season may neutralize this result, or favor one or the other. Therefore, the results of one year's work is plainly seen to be misleading to the slow observer, and the omitting of the applications to obtain such information is necessary.

During the season of 1894, bone black was applied to a section of our Station field. Since then, the continuous beneficial results of this application has been clearly noticeable in the color and yields of both cotton and sorghum. This section has been cropped three successive years, and the yields of sorghum this last year was larger than ever before. The same holds true for cotton yields, as plainly shown in this year's work.

Fertilizer—Corn.

Plot number.	Fertilizer applications per acre, Golden Beauty (3 feet 8 inches by 2½ feet).	Yield in pounds Shuck Corn.	Per Cent Shucks.	Per Cent Cobs.	Per Cent Shelled Corn.	Number Ears in 70 pounds Ear Corn.	Pounds Shelled Corn in 70 pounds Ears.	Pounds Cobs in 70 pounds Shelled Corn.	Total Yield in Bushels.	Value at 40 Cents Per Bushel.	Cost of Fertilizer	Increase Profit over Check Plot.
16	* Green Peas	1680	10.5	17.2	72.3	180	56.5	13.5	*24*	$9.60	$0.75	$—0.49
17	(Check)	1918	7.5	17.1	75.4	165	57	13	*27.4*	*10.96*	.....	.....
18	600 pounds Kainit	1582	6.4	18	75.6	171	56.5	13.5	22.6	9.04	4.42	—4.72
19	1000 Lime	1624	6.7	18	74.3	169	56.2	13.75	23.2	9.60	6.66	—6.40
20	2000 pounds Wood Ashes, 400 pounds C. S. Meal, 300 Acid P.	1666	6.6	18	75.4	181	56	14	23.8	9.52	6.25	—6.07
21	100 pounds Kainit, 400 Acid P., 150 pounds Muriate Potash.	1862	7.3	18	74.7	174	56	14	26.6	10.64	8.60	—7.30
27	(Check)	1351	18	19	63	195	56	14	*19.3*	*7.72*	.....	.....
28	2000 Wood Ashes	1547	9.7	17	73.3	181	56.5	13.5	22.1	8.84	1.00	—1.36
29	2000 Stable Manure, 300 pounds Acid P., 200 C. S. Meal.	1645	11	18	71	187	55.5	14.5	23.5	9.40	2.75	—2.55
30	200 Acid Phosphate, 4000 pounds Stable Manure.	1365	24	15	61	190	56	14	19.5	7.80	2.50	—3.90
31	500 pounds Wood Ashes, 200 pounds Muriate Potash.	994	10	16.7	73.3	200	57	13	14.2	5.68	6.25	—9.77
45	(Check)	1869	17	15	68	167	57	13	*26.7*	*10.68*	.....	.....
46	500 pounds Acid Phosphate	2604	11	17	72	161	56	14	37.2	14.88	3.75	1.45
47	300 pounds Nitrate Soda	1834	12	15	73	156	57	13	26.2	10.48	9.75	—8.95
48	4000 pounds Stable Manure	1939	11	17	72	147	56.5	13.5	27.7	11.08	1.00	0.40
49	500 pounds C. S. Hull Ashes	1736	14	15.5	70.5	163	57	13	24.8	9.92	1.25	—1.01
50	500 pounds Bone Black	1988	11.5	17.5	71	171	56	14	28.4	10.36	5.00	—4.32
51	500 pounds Bone Meal	2086	9	18	73	155	56	14	29.8	11.92	5.75	—3.51
52	325 pounds Bat Guano	1911	10	17	73	157	56.5	13.5	27.3	10.92	.....	.....
53	*Green Peas	1246	7.5	17.8	74.7	189	56.5	13.5	17.8	7.12	0.75	—3.31
54	500 C. S. Meal	1848	10	17.8	72.2	171	56	14	26.4	10.56	3.75	—2.87
55	(Check)	1519	10	17.7	72.3	171	56.25	13.75	*21.7*	*8.68*	.....	.....

*Cow peas sown between rows of corn at last plowing at the rate of ½ bushel per acre.

NITROGENOUS.

Green Peas—Yield per acre, 24 bushels; value of yield less cost of fertilizer, $.....; decrease in value below check plot, $.....

Stable Manure—Yield per acre, 27.7 bushels; value of yield less cost of fertilizer, $10.08; increase in value above check plot, $0.40.

*Bat Guano**—Yield per acre, 27.3 bushels; value of yield, $10.92.

Cotton Seed Meal—Yield per acre, 26.4 bushels; value of yield less cost of fertilizer, $6.81; decrease in value below check plot, $2.87.

Nitrate of Soda—Yield per acre, 26.2 bushels; value of yield less cost of fertilizer, $0.73; decrease in value below check plots, $8.95.

PHOSPHATIC.

Acid Phosphate—Yield per acre, 37.2 bushels; value of yield less cost of fertilizer, $10.73; increase in value above check plot, $1.45.

Bone Black—Yield per acre, 28.4 bushels; value of yield less cost of fertilizer, $5.36; decrease in value below check plot, $4.32.

Bone Meal—Yield per acre, 29.8 bushels; value of yield less cost of fertilizer, $6.17; decrease in value below check plot, $3.51.

POTASH.

Kainit—Yield per acre, 22.6 bushels; value of yield less cost of fertilizer, $4.62; decrease in value below check plot, $4.72.

Wood Ashes—Yield per acre, 22.1 bushels; value of yield less cost of fertilizer, $7.84; decrease in value below check plot, $1.36.

Cotton Seed Hull Ashes—Yield per acre, 24.8 bushels; value of yield less cost of fertilizer, $8.67; decrease in value below check plot, $1.01.

COMBINATIONS.

Wood Ashes, Cotton Seed Meal, Acid Phosphate—Yield per acre, 23.8 bushels; value of yield less cost of fertilizer, $3.27; decrease in value below check plot, $6.07.

Kainit, Acid Phosphate, Muriate Potash—Yield per acre, 26.6 bushels; value of yield less cost of fertilizer, $2.04; decrease in value below check plot, $7.30.

Stable Manure, Acid Phosphate, Cotton Seed Meal—Yield per acre, 23.5 bushels; value of yield less cost of fertilizer, $6.65; decrease in value below check plot, $2.55.

Acid Phosphate, Stable Manure—Yield per acre, 19.5 bushels; value of yield less cost of fertilizer, $5.30; decrease in value below check plot, $3.90.

Wood Ashes, Muriate Potash—Yield per acre, 14.2 bushels; value of yield less cost of fertilizer, $0.57; decrease in value below check plot, $9.77.

The average yield of all check plots was 23.7 bushels. Plots 16, 20, 21, 46, 47, 48, 49, 50, 51, 52 and 53 gave an increase in yield over this average, though the only plots giving an increase in money value were 46 and 48. Therefore, the importance of considering the cost of the applications is impressed on our minds. While all applications of phosphoric acid gave an increase in yield, phosphoric acid, in simple form alone, gave an increase in money value. The same is true of the nitrogenous applications—stable manure alone gave an increase in money value, though other forms increase the yield.

We have endeavored to show as plainly as possible the difference in growth, vitality, and yield, due to each fertilizer as applied in our corn experiments. On May 3rd, when the corn was sixty days old, a representative stalk of each plot was photographed. From these photographs the half-tone engravings found on the following pages were made.

Plate No. 1 represents the difference in growth due to the different forms of Nitrogenous fertilizers.

Plate No. 2 represents the difference in growth due to the different forms of Phosphatic fertilizers.

Plate No. 3 represents the difference in growth due to the different forms of Potash fertilizers.

Plate No. 4 represents the difference in growth due to different combinations of the three elements, Nitrogen, Phosphoric Acid and Potash.

In *Plate No.* 5 the representative stalk of the best plot (as to yield) in each of the foregoing groups are compared.

In each group we find that the yields on each plot agree very closely with the appearance as to growth and vitality at the time the photographs of the plants were taken.

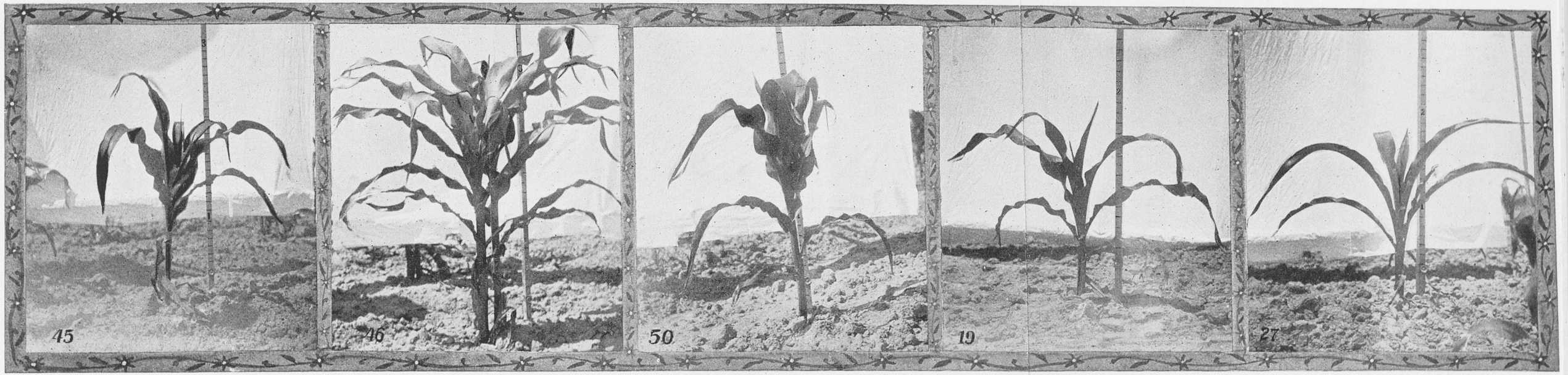
NITROGENOUS GROUP.

PLATE No. 1

No Manure. | 300 lbs. Nitrate Soda. | 4000 lbs. Stable Manure. | 325 lbs. Bat Guano. | 500 lbs. Cotton Seed Meal.

PHOSPHORIC ACID GROUP.

PLATE No. 2



No Manure. | 500 lbs. Acid Phosphate. | 500 lbs. Bone Black. | 1000 lbs. Lime. | No Manure.

POTASH GROUP. PLATE No. 3

No Manure. | 600 lbs. Kainit. | 2000 lbs. Wood Ashes. | 500 lbs. Cotton Seed Hull Ashes. | 500 lbs. Wood Ashes. 200 lbs. Muriate Potash.

COMBINATION GROUP. PLATE No. 4

No Manure.

200 lbs. Wood Ashes.
400 lbs. Cotton Seed Meal.
300 lbs. Acid Phosphate.

100 lbs. Kainit.
400 lbs. Acid Phosphate.
150 lbs. Muriate Potash.

2000 lbs. Stable Manure.
300 lbs. Acid Phosphate.
200 lbs. Cotton Seed Meal.

200 lbs. Acid Phosphate.
4000 lbs. Stable Manure.

BEST OF EACH GROUP.

NITROGENOUS. PHOSPHATIC. POTASH. COMBINATION.

No Manure.
(27.4 bushels.)

4000 lbs. Stable Manure.
(27.7 bushels.)

500 lbs. Acid Phosphate.
(37.2 bushels.)

500 lbs. Cotton Seed Hull Ashes.
(24.8 bushels.)

100 lbs. Kainit.
400 lbs. Acid Phosphate.
150 lbs. Muriate Potash.
(26.6 bushels.)

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DESCRIPTION OF SOIL AND CLIMATE

The land included within our experimental field is commonly known as "prairie post oak loam," of a black, sandy nature, underlaid by a subsoil of stiff blue clay. The surface soil is shallow, varying in depth from six to twelve inches. The subsoil is of exceeding close texture, and almost impervious to water. Drainage is very poor, the fall not being sufficient to carry off surplus water. Water not being able to penetrate the subsoil, stands, over-saturating the surface soil until evaporated. It "bakes" easily, which often takes place during the growing season, before it is possible to put a man and team in the field. This field has been in cultivation only four years, during which time it has grown three experimental and one general crop. This character of land is known as "poor" land, and badly deficient in humus.

To better understand the soil upon which these experimental crops were grown, it will be necessary to give a chemical and mechanical analysis of the soil, which is given in the two following tables. Twenty-six samples were taken to embody the different characteristics, if any, of the entire field:

Soil

Plot. No.—	1.	3.	5.	7.	9.	11.	13.	15.	17.	20.	25.	26.
Silica and Sand.....	94.39	94.28	94.4	94.62	94.11	95.15	94.63	94.06	93.65	94.81	94.07	93.85
Water—air dry.....	0.55	0.57	0.90	0.49	0.62	0.56	0.86	0.61	1.14	0.62	0.84	0.85
Organic Matter.....	2.58	2.66	2.7	2.32	2.59	2.64	2.40	2.44	2.16	2.11	2.55	3.4
Oxides of Iron and Alumina.	1.22	2.08	1.51	2.48	2.18	0.83	2.22	2.39	2.05	1.91	2.02	1.62
Calcium Oxide.....	0.12	0.11	0.32	0.11	0.13	0.33	0.09	0.12	0.12	0.13	0.15	0.41
Magnesium Oxide	0.12	0.10	0.1	0.10	0.11	0.42	0.10	0.10	0.14	0.12	0.08	0.21
Phosphoric Anhydride.	0.07	0.07	0.11	Trace	Trace	0.16	0.02	0.03	0.05	0.04	0.03	.....
Sulfuric Anhydride.	0.04	0.05	0.30	0.04	0.05	0.24	0.06	0.06	Trace	Trace	Trace	0.08
Carbon Dioxide.....	None	None	None	None	None	None	None	None	None	None	None	None
Alkaline Sulfates	0.22	0.18	0.37	0.17	0.23	0.37	.23	0.32	0.24	0.28	0.19	0.28

Analyses.

28.	30.	31.	33.	35.	37.	39.	43.	45.	47.	49.	51.	53.	55.
93.23	94.50	93.99	94.13	94.31	94.38	94.23	93.73	93.05	93.96	94.85	94.15	95.26	95.13
0.95	0.66	0.72	0.73	0.70	0.75	0.90	0.62	0.54	0.72	0.48	0.63	0.45	0.51
2.85	2.46	2.11	2.72	2.88	2.7	2.5	2.4	3.23	2.17	3.52	1.77	1.76	2.09
1.56	2.00	1.92	1.71	1.71	2.15	1.80	2.75	3.02	2.70	2.4	2.65	2.4	1.72
0.29	0.13	0.12	0.13	0.13	0.15	0.15	0.12	0 12	0.16	0.12	0.23	0.07	0.05
0.18	0.12	0.14	0.13	0.12	0.15	0.15	0.13	0.06	0.04	0.11	0.12	0.12	0.08
.03	0.03	0.02	0.02	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace
0.06	Trace	Trace	Trace	0.04	0.16	0.17	0.21	0.30	0.23	0.17	0.21	0.21	0.21
None	None	None	None	None	None	None	None	None	None	None	None	None	None
0.20	0.22	0.27	0.20	0.23	0.48	0.25	0.12	0.12	0.53	0.33	0.15	0.14	0.12

Mechanical Analysis.

Plot No—	1.	3.	5.	7.	9.	11.	13.	15.	17.	20.	26.	28.	30.	31.	33.	35.	37.	39.	41.	43.	45.	47.	49.	51.	53.	55.
Between 1 and 0.5 mm. Diameter.	.17	1.11	.46	.34	1.52	.84	1.46	.21	.30	1.31	.21	.96	1.58	.51	.28	.30	.93	.25	.39	.42	.48	.29	.25	.86	1.28	.28
Between 0.5 and .25 mm. Diameter.	21.27	23.60	28.34	43.53	31.68	31.0	39.96	25.27	19.33	43.36	11.65	17.25	23.17	19.00	20.2	32.56	25.71	20.0	26.22	30.47	24.05	30.84	29.46	30.76	33.02	27.72
Between .25 and .05 mm. Diameter—Sand.	49.15	49.76	52.98	41.24	46.66	42.0	41.84	46.11	49.66	38.81	59.07	49.67	45.12	50.67	50.94	50.0	44.77	48.69	48.02	42.98	40.89	38.89	42.45	44.84	41.06	55.01
Between .05 and 0.01 mm. Diameter—Silt.	10.71	6.87	4.70	5.37	8.40	8.44	6.71	10.01	14.93	3.78	8.57	13.18	6.61	5.06	3.74	3.59	15.23	8.62	14.22	9.26	2.76	4.99	3.98	5.87	6.32	10.02
Below .01 mm.—Clay.....	15.58	15.43	9.92	6.71	8.53	14.52	6.77	15.35	12.48	10.01	16.25	15.14	21.40	21.93	21.39	9.97	9.91	19.04	8.85	13.85	28.05	22.10	19.86	15.77	16.11	4.37
Loss on Ignition.....	3.17	3.23	3.60	2.81	3.21	3.20	3.26	3.05	3.30	2.73	4.25	3.80	3.12	2.83	3.45	3.58	3.45	3.4	2.3	3.02	3.77	2.89	4.00	2.40	2.21	2.60

The foregoing analyses were made by Profs. Tilson and Todd, of this Station. "The alkalies—potash and soda—were so small that it was considered unnecessary to separate them." Each sample as taken represents as near as possible the soil characteristics of two plots; i. e., soil sample from plot number 1 represents itself and number 2, etc.

The tables show that all parts of the field are remarkably similar, both chemically and mechanically. The small amount of phosphoric acid and potash contained in this soil is marked and possessed of considerable interest. The mere statement that a soil contains a very small per cent of one or two elements is no argument in favor of its sterility. Either one, or both, may be unusually available as plant food. Still, in order that the maximum results may be reached, it is necessary that these elements be present in an available form to a certain degree. It is often found that a soil contains a large per cent of some one element, and still the per cent soluble or available will be so low that plant development will be hindered.

In our soil this peculiarity exists: there is a minimum amount of phosphoric acid and potash; plant growth responds freely to applications of phosphoric acid, but with potash no good results have thus far been obtained in our field trials. The conclusions drawn here, and based on former field trials, combined with the facts presented in the foregoing analytical tables, are as follows:

1. The minimum amount of potash in our soil is available to such a degree that no successful application of that element can be made.

2. Phosphoric acid in the soil is not readily available, and applications of that element can be made profitable.

The mechanical analyses shows about 70 per cent sand, of which 40 to 45 per cent is fine dust. The fineness of the particles of sand, mixed with from 19 to 20 per cent clay, renders this soil very tenacious. It is cold and hard to work on account of the fact that it absorbs water in large quantities and holds it until evaporated. Plowed when wet, it "cakes" into hard clods, which, when dried out, are exceedingly difficult to break down.

The conditions necessary in a perfect soil are rarely found in nature. By artificial means they can be produced, but time and labor are generally required in costly amounts. A soil of this kind contains all the elements necessary to plant-growth in perfect proportions; sand, to render it warm and friable, to absorb moisture and allow the proper passage of air; clay, to prevent a too rapid evaporation of water; lime, to assist in the decay of vegetable matter and prevent floculation; humus, to assist in rendering the various elements available for plant-growth.

To correct the present condition of our soil, we readily see that it is necessary to change the soil both chemically and physically. With such views, the fertilizer test mentioned in this Bulletin was formulated to continue during several successive seasons—the fertilizers to be applied every alternate season. This was done to observe more closely the mechanical effect produced by each application.

RAINFALL — TEMPERATURE.

In publishing the results of field tests, it is important and of great interest to the farmer to give as near as possible an explanation of the weather conditions. While he may know that our coldest weather comes about January, and our warmest during July and August, yet it is of interest to him to understand the daily temperature during the time from planting until harvesting. He knows, perhaps, that we receive about thirty inches of rain per annum, but the question is, when does it come? To place these conditions plainly before the reader, we give the following tables, which give date and amount of rainfall; maximum, minimum and mean temperature during the year; number of clear, cloudy and fair days during each month; and dates of frost as occurring during the year. The study of these conditions, with reports of field experiments, brings the reader in close connection with the work as carried on.

	Maximum.	Minimum.	Daily mean.	Monthly mean.	No. fair days.	No. clear days.	No. cloudy days.
January	72	14	58.4	48.1	7	8	16
February	78	29	64.6	55	9	9	10
March	83	40	73.5	64.5	6	7	8
April	89	49	77.7	66.8	8	13	9
May	88	53	81.6	72	8	15	8
June	98	.....	.....	.....	12	10	8
July	101	.....	.....	.....	10	17	4
August	101	.....	87.5	80.7	12	11	8
September	95	53	82.6	76.7	10	15	5
October	91	44	78.5	70.2	9	16	6
November	82	33	66.6	58.1	13	11	6
December	75	23	61.1	51.3	11	7	13

Frosts occurred as follows:

January.—4th, 5th, 6th, 7th, 20th, 25th, 26th, and 28th; all heavy except the last.

February.—Light frosts on the 12th and 27th.

March.—Heavy frost on the 24th.

November.—Light frosts on 2nd, 17th, 18th, and 20th; heavy on the 19th and 30th.

December.—Heavy frosts on 3rd, 17th and 18th; light on 14th.

Rainfall in Inches during 1897.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total
January	.55	1.14	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.06	.15	.31	.....	.81	.....	.....	.....	.....	.....	.20	.05	.....	.....	.....	.20	.38	3.88
February	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15
March	.....	.....	.....	.....	.15	.....	.....	.....	.....	.10	.....	.....	.....	.....	.25	.20	.....	.62	.....	.....	.10	.....	.....	.....	.....	.....	.....	1.45	.....	.....	.....	2.87
April	.....	.....	.29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	.....	.76	.....	.....	.....	1.57
May	.....	.....	.....	.....	.....	.....	.80	.....	.....	.....	.21	.....	.....	.27	.....	.30	.....	.....	.....	.....	.....	.....	.52	.....	.....	.....	.....	.....	.60	.....	.....	2.70
June	.....	.....	.50	1.29	.....	.....	.80	.....	.....	.....	.....	.28	.....	.21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.12	.....	.....	.....	.15	.....	.....	3.35
July	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.20	.....	.....	.....	.....	.....	.25	.....	.....	.....	.....	1.45
August	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.98	.....	.....	.....	1.60	.66	.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.68
September	.....	.....	.....	.....	.....	.33	.....	.....	.....	.....	.....	.....	1.98	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.46
October	.....	.....	.....	.....	.....	.....	.....	.....	.....	.22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.30	.....	.....	.....	.....	2.50	.....	.....	.....	.....	1.05	5.07
November	.....	.....	.....	.....	.....	.....	.....	.65	.....	.....	.....	.....	.....	.....	.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.33	.....	.....	.....	1.28
December	.....	.28	.....	.....	.....	.....	.....	.....	.....	1.54	.....	.....	.....	.....	.....	.11	.....	.92	.....	.....	.....	.....	.10	.....	.66	.....	.....	.....	.....	.....	.....	3.61
Total for year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33.07

EFFECT OF SEASON ON CROPS.

Corn was planted on March 4th, and it will be observed from the above tables that it was immediately followed by conditions which rendered the land cold and wet for thirty days. While the land was in this condition, a heavy frost occurred—March 24th—which was disastrous in its effects on all of the "shallow prepared" land. The per cent loss on subsoiled land was practically nothing; five-inch preparation, 25 per cent; two-inch preparation, 75 per cent. The resistance to frost offered by land prepared to a depth of fourteen inches was no doubt due to the stirring of the subsoil and thereby lowering the water table to such an extent as to warm the land. The storm and rain of June 4th injured the corn by blowing down and breaking many stalks. The largest portion of stalks blown down righted themselves very quickly. The rains during September, October and December came at inopportune times, and resulted in some loss of cotton, especially the heavy rains of October 21st and 26th. Barring the above mentioned facts, the season was better than the average.

The following table gives the average yearly yields in seed cotton of the five varieties of cotton used in this year's work.

	1894.	1895.	1897.
Bohemian	952.2	925.7	773.0
Jones' Improved	.....	1109.5	746.0
Welborn's Pet	.....	782.0	706.0
Peterkin Limbed Cluster	1419.0	943.5	720.7
Texas Oak	.....	1185.5	566.0

SUMMARY.

The following summary of the result of experiments on cotton and corn during 1894 and 1895 are given, that the reader may easily refer and compare the results of 1897:*

SEASON OF 1895 (34 Varieties).

The five varieties which made the *largest yield seed cotton* per acre in 1895, *early planting*, were:

	Pounds		Pounds
Dickson Early Cluster	1364	Texas Oak	1196
Peerless	1223	Welborn's Pet	1195
Cochran's Prolific	1216		

The five varieties which made the *largest money value* per acre in 1895, *early planting*, were:

Texas Oak	$35 56	Welborn's Pet	$34 42
Jones' Improved	34 89	Dickson's Early Cluster	33 72
Cochran's Prolific	34 88		

* There were no field experiments undertaken at the College in 1896.

The five varieties which made the *largest yield seed cotton* per acre in 1895, *late planting*, were:

	Pounds		Pounds
Welborn's Pet	1175	Sure Fruit	1099
Beck's Prolific	1142	Texas Oak	1095
Peterkin Limbed Cluster	1114		

The five varieties which made the *largest money value* per acre in 1895, *late planting*, were:

Welborn's Pet	$33 88	Peterkin Limbed Cluster	$31 81
Jones' Improved	32 84	Texas Oak	31 43
Beck's Prolific	31 92		

SEASON OF 1894 (31 Varieties).

The five varieties which made the *largest yield seed cotton* per acre in 1894, *early planting*, were:

	Pounds		Pounds
Sure Fruit	1282	Hawkins' Improved	1229
Drake's Cluster	1251	Allen Long Staple	1224
Peerless	1230		

The five varieties which made the *largest yield seed cotton* per acre in 1894, *late planting*, were:

	Pounds		Pounds
Peterkin Limbed Cluster	1908	Truitt's Improved	1522
Herlong	1760	Southern Hope	1518
Peterkin	1538		

BEST VARIETIES OF CORN—1895 (62 Varieties).

"FIELD CORN" (22 Varieties).

The five varieties of *"Field Corn"* which made the largest yields per acre were:

	Bushels		Bushels
Texas Yellow	35.9	Renfro's Improved	34.4
Texas White	35.	Shaw's Improved	34.4
Welborn's Conscience	34.6		

The thirteen varieties making more than twenty-five bushels per acre were:

Chester County Mammoth	32.5	North Texas Yellow	27.5
Farmer's Pride	28.1	Piasa Queen	31 2
Giant White Dent.....	26.8	Red Cob Ensilage	30.3
Johnson's Large White Southern Bread	31.7	Southern White Gourd Seed	28.4
Mammoth White Surprise	32.3	Virginia Horse Tooth ...	28.8
Mexican, or Red Foliage .	27.5	White Rockdale	32.9
New Giant Beauty	26.6		

The four *Field* varieties which made less than twenty-five bushels per acre were:

Everitt's Mortgage Lifter.	22.0	Dent	19.7
Mammoth Yellow	19.6	Southern Queen	23.6
N. B. & G.'s Conqueror			

"EARLY FIELD CORN" (18 Varieties).

The five *Early* varieties which made the largest yields per acre were:

Golden Beauty	47.4	Hickory King	40.
Forsyth's Favorite	43.2	Marsfield White Dent ...	39.9
Golden Dent	40.8		

The eleven *Early* varieties which made more than twenty-five bushels per acre were:

Champion White Pearl ..	25.7	Riley's Favorite	33.9
Farmer's Favorite Dent..	29.1	Waterloo Extra Early Dent	37.6
Golden Cable	27.3	Waterloo Extra Early Dent	35.8
Kansas King	36	White Cap Dent	29.1
N. B. & G's Rustler White	28.2		
Old Cabin Home	37		
Pride of the North	27.5		

The two *Early* varieties which made less than twenty-five bushels per acre were:

Huron	20	N. B. & G.'s Dokata Dent.	22.3

"EXTRA EARLY FIELD CORN" (19 Varieties).

The five *Extra Early* varieties which made the largest yields per acre were:

Murdock	43.8	Thoroughbred White Flint	33.4
The Leaming	42.5	Hundred Day	32.3
Early Mastodon	41		

The four *Extra Early* varieties which made more than twenty-five bushels per acre were:

Early Eclipse	28.5	Long Pennsylvania Yellow	28.7
Large White Flint	25.7	Minnesota King	31.3

The ten *Extra Early* varieties which made less than twenty-five bushels per acre were:

Adam's Early	22.3	Longfellow	19
Early Canada	16.4	Long Yellow Flint	22.2
Golden Dewdrop	16.3	Mercer Yellow	11.4
King of Earlies	23.4	Southern Roasting Ear	17.2
King Phillip	15.8	Tuscarora	13.8

"PROLIFIC CORN" (3 Varieties).

Mosby's Prolific	48	Dungan's Prolific	42.8
Blount's Prolific	46.4		

FIVE VARIETIES MAKING LARGEST YIELDS.

Mosby's Prolific	48	Golden Beauty	47.4
Blount's Prolific	46.4	Murdock	43.8
Forsyth's Favorite	43.2		

The thirteen varieties making more than twenty-five bushels per acre were:

Chester County Mammoth	32.5	North Texas Yellow	27.5
Farmer's Pride	28.1	Piasa Queen	31.2
Giant White Dent	26.8	Red Cob Ensilage	30.3
Johnson's Large White Southern Bread	31.7	Southern White Gourd Seed	28.4
Mammoth White Surprise.	32.3	Virginia Horse Tooth	28.8
Mexican, or Red Foliage	27.5	White Rockdale	32.9
New Giant Beauty	26.6		

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Everitt's Mortgage Lifter	22.	Dent	19.7
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Golden Beauty	47.4	Hickory King	40
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Golden Dent	40.8		

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Champion White Pearl	25.7	Pride of the North	27.5
Farmer's Favorite Dent	29.1	Riley's Favorite	33.9
Golden Cable	27.3	Waterloo Early Dent	37.6
Kansas King	36	Waterloo Extra Early Dent	35.8
N. B. & G.'s Rustler White	28.2	White Cap Dent	29.1
Old Cabin Home	37		

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CORN AND COTTON EXPERIMENTS

AT COLLEGE STATION IN 1894.

We have many calls for copies of reports relating to the tests of 61 varieties of corn and 31 varieties of cotton, grown on the Station grounds during 1894. The first edition of that report (Bulletin 34) has been entirely exhausted, and we have extracted for publication in these pages some of the more important matter relating to the varieties of corn and cotton tested at that time. This printed matter includes description of varieties, addresses of parties from whom seed was obtained, and indicates the value of the crop grown.

[From Bulletin 34.]

"FIELD EXPERIMENTS."

BY J. H. CONNELL AND JAS. CLAYTON.

"A TEST OF SIXTY-ONE VARIETIES OF CORN.

"A brief description of sixty-one varieties of corn planted on Texas Experiment station March 23, 1894, is given below:

"Bud worms injured the varieties seriously from April 5 to April 20, and did such injury to the young plants that the stand of each variety was made more or less imperfect. The hot winds of July 1, which did much damage to the corn crop of the entire West, ruined all the late maturing kinds tested here.

"The results of the experiment have been so vitiated by these two causes that no fair comparison of yields can be made. It is but fair to say that the low yield obtained from all varieties tested is due to some extent to one or both of the causes mentioned. The publication of such yields would prove misleading and harmful, unless it is explained that they are presented only for the purpose of indicating some of the better varieties of the early maturing kinds of corn. Of those tried we can endorse a number for the use of Texas farmers, including the following: Kansas King, Improved Golden Dent, Dakota Dent, Wisconsin White Dent, Pride of the North, Rustler White, and Riley's Favorite. Sugar corn for garden culture: Early Naragansett, First of All, Ne Plus Ultra, Perry's Hybrid, Shaker's Early, and Stowell's Evergreen.

"From the experiments of the past season we do not feel justified in recommending any one of the middle or late maturing varieties over another. All varieties planted in 1894 will be under test again in 1895, and many new ones will be added to the list. It is hoped that fair conditions will prevail, and the results obtained from the coming season's work in testing these varieties will be more reliable and satisfactory than for the season of 1894.

"Below we give some of the most prominent characteristics of the varieties of corn tested in 1894, including a description of grain, ear, and stalk, yield per acre, and per cent of grain in a hundred pounds of shucked ear corn. The seedsmen of whom each variety was obtained is given with address. The varieties are grouped into early, late, and prolific, and each group is alphabetized.

"EARLY VARIETIES.

"*Angel of Midnight.*—Seed from Perry Seed Store, Syracuse, N. Y. A yellow flint variety; roasting ear June 6; stalk and ear both small; 100 pounds shucked ear corn yield 78.3 pounds grain.

"*Clark's Mastodon.*—Seed from T. W. Wood & Son, Richmond, Va. A yellow dent variety; roasting ear June 18; stalk and ear both small; grain long and soft; 100 pounds shucked ear corn yield 81.2 pounds grain.

"*Early Butler.*—Seed from Storrs, Harrison & Co., Plainville, Ohio. A yellow dent variety; roasting ear June 11; stalk and ear both small; grain long and soft; 100 pounds shucked ear corn yield 86.3 pounds grain.

"*Early Canada.*—Seed from J. M. Thorburn, New York. A yellow flint variety; roasting ear June 11; stalk small; ear long, with short flint grains; 100 pounds shucked ear corn yield 70.1 pounds grain.

"*Early Eclipse.*—Seed from Plant Seed Company, St. Louis Mo. A yellow dent variety; roasting ear June 20; stalk and ear medium size; grain long and soft; 100 pounds shucked ear corn yield 83.4 pounds grain.

"*Early Mastodon.*—Seed from Storrs, Harrison & Co., Plainville, Ohio. A yellow dent variety; roasting ear June 18; stalk and ear medium size; grain long and soft; 100 pounds shucked ear corn yield 83.6 pounds grain.

"*Extra Early Huron.*—Seed from Storrs, Harrison & Co., Plainville, Ohio. A yellow dent variety; roasting ear June 9; stalk small; ears short and bright yellow; grain long and firm; 100 pounds shucked ear corn yield 83.6 pounds grain.

"*First Premium.*—Seed from J. A. Everitt, Indianapolis, Ind. White dent variety; roasting ear June 20; stalk and ear medium size; grain very white, large, and firm; 100 pounds shucked ear corn yield 79.4 pounds grain.

"*Forsyth's Favorite.*—Seed from J. A. Everitt, Indianapolis, Ind. A white dent variety; roasting ear June 20; stalk and ear medium size; ears very heavy and firm; grain very white, broad, and long; 100 pounds shucked ear corn yield 80.7 pounds grain.

"*Gentry's Early Market.*—Seed from T. W. Wood & Son, Richmond, Va. A white flint variety; roasting ear June 20; stalk and ear medium size; ear heavy, firm, and long; grain short, broad, flinty, and very white; 100 pounds shucked ear corn yield 79.8 pounds grain.

"*Golden Beauty.*—Seed from Storrs, Harrison & Co., Plainville, Ohio. A yellow dent variety; roasting ear June 20; stalk and ear medium size; grain very broad, deep and firm; 100 pounds shucked ear corn yield 82.3 pounds grain.

"*Golden Dent.*—Seed from J. M. Thorburn, New York. A yellow dent variety; roasting ear June 20; stalk and ear medium size; 100 pounds shucked ear corn yield 82.9 pounds grain.

"*Golden Dewdrop.*—Seed from J. M. Thorburn, N. Y. A yellow flint variety; roasting ear June 11; stalk small, ears very long, grain short, broad and flinty; 100 pounds shucked ear corn yield 74.3 pounds grain.

"*Hickory King.*—Seed from Texas Seed and Floral Co., Dallas, Texas. A white dent variety; roasting ear June 20; stalks and ear medium size; grain very deep and broad; 100 pounds shucked ear corn yield 85.7 pounds grain.

"*Improved Golden Dent.*—Seed from T. W. Wood & Son, Richmond, Va. A yellow dent variety; roasting ear June 20; stalks and ear medium size; 100 pounds shucked ear corn yield 84 pounds grain.

"*Kansas King.*—Seed from Texas Seed and Floral Co., Dallas, Texas. A white dent variety; roasting ear June 18; stalk and ear medium size; 100 pounds shucked ear corn yield 82.9 pounds grain.

"*King of Earlies.*—Seed from Storrs, Harrison & Co., Plainville, Ohio. A yellow dent variety; roasting ear June 9; stalk and ear small; ear short and very firm, with bright yellow grain; 100 pounds shucked ear corn yield 85.2 pounds grain.

"*King Phillip.*—Seed from J. M. Thorburn, New York. A red flint variety; roasting ear June 9; stalk very small; ear very long and small, with short, broad, red flint grain; 100 pounds shucked ear corn yield 75.4 pounds grain.

"*Longfellow.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A yellow flint variety; roasting ear June 18; stalks very small; ears very long, with short, broad, yellow flint grains; 100 pounds shucked ear corn yield 78.4 pounds grain.

"*Long Yellow Flint.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A yellow flint variety; roasting ear June 11; stalk small; ear very long and

small, with short, broad, yellow grain; 100 pounds shucked ear corn yield 76.1 pounds grain.

"*Long White Flint.*—Seed from J. M. Thorburn & Co., New York. A white flint variety; roasting ear June 11; stalk small; ear very long, small, with white flint grain; 100 pounds shucked ear corn yield 70.1 pounds grain.

"*Mercer Yellow.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A yellow dent variety; roasting ear June 18; stalk and ear very small; 100 pounds shucked ear corn yield 72.6 pounds grain.

"*Minnesota White.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A white flint variety; roasting ear June 18; stalk small; ear very long, with short, broad, white flint grains; 100 pounds of shucked ear corn yield 80.6 pounds grain.

"*Murdock Ninety Day.*—Seed from Plant Seed Company, St. Louis, Mo. A yellow dent variety; roasting ear June 15; stalk small; ear short and firm, with long, bright yellow grain; 100 pounds shucked ear corn yield 84 pounds grain.

"*N. B. G. Co.'s Dakota Dent.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A yellow dent variety; roasting ear June 9; stalk and ear medium size; 100 pounds shucked ear corn yield 82.9 pounds grain.

"*N. B. G. Co.'s Rustler White.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A white dent variety; roasting ear June 9; stalk and ear medium size; 100 pounds shucked ear corn yield 80.6 pounds grain.

"*Pride of the North.*—Seed from Plant Seed Company, St. Louis, Mo. A yellow dent variety; roasting ear June 15; stalk medium size; ear short and firm; grain long and bright yellow; 100 pounds shucked ear corn yield 84 pounds grain.

"*Riley's Favorite.*—Seed from J. A. Everitt, Indianapolis, Ind. A yellow dent variety; roasting ear June 15; stalk and ear medium size; 100 pounds shucked ear corn yield 80.7 pounds grain.

"*Squaw.*—Seed from Northrup, Braslan & Goodwin Co., Minneapolis, Minn. A white flint variety; roasting ear June 9; stalk small; ear very small, with short white flint grain; 100 pounds shucked ear corn yield 77.1 pounds grain.

"*St. Charles White.*—Seed from Plant Seed Company, St. Louis, Mo. A white dent variety; roasting ear June 20; stalk and ears medium size; 100 pounds shucked ear corn yield 80.7 pounds grain.

"*The Leaming.*—Seed from Plant Seed Company, St. Louis, Mo. A yellow white-cap dent variety; roasting ear June 20; stalk medium size; ear above medium; 100 pounds shucked ear corn yield 81.2 pounds grain.

"*Thoroughbred White Flint.*—Seed from J. M. Thorburn, New York. A white flint variety; roasting ear June 28; injured by hot winds; stalk medium size; ears small and long, with broad, short flint grain; 100 pounds shucked ear corn yield 73.1 pounds grain.

"*White Pearl.*—Seed from J. M. Thorburn, New York. A white dent variety; roasting ear June 20; stalk and ear medium size; 100 pounds shucked ear corn yield 81.7 pounds grain.

"*Wisconsin White Dent.*—Seed from J. M. Thorburn, New York. A white dent variety; roasting ear June 18; stalk and ear medium size; 100 pounds shucked ear corn yield 85.6 pounds grain.

"COMMON FIELD VARIETIES.

"*Alabama Experiment Station Yellow.*—Seed from Alabama Experiment Station, Auburn, Ala. A yellow flint variety; not in roasting ear July 1; badly injured by hot winds occurring at that date; stalk large and vigorous; ears medium size; 100 pounds shucked ear corn yield 80 pounds grain.

"*Big Seed.*—Seed from I. N. Shannon, Goodlettsville, Tenn. A white dent variety; roasting ear June 28; badly injured by hot winds; stalk large and vigorous; ear and grain very large; 100 pounds shucked ear corn yield 84.6 pounds grain.

"*Chester County Mammoth.*—Seed from J. M. Thorburn, New York. A yellow dent variety; roasting ear June 20; stalk and ear medium size; 100 pounds shucked ear corn yield 82.3 pounds grain.

"*Clayton Bread.*—Seed from Alabama Experiment Station. A white flinty variety; roasting ear June 20; stalk very large and vigorous; ear above medium size; 100 pounds shucked ear corn yield 83.7 pounds grain.

"*Everitt's Mortgage Lifter.*—Seed from J. A. Everitt, Indianapolis, Ind. A yellow dent variety; roasting ear June 18; stalk and ear medium size; ears very

firm and heavy and grow near the ground; 100 pounds shucked ear corn yield 82.3 pounds grain.

"*Giant Broad Grain.*—Seed from T. W. Wood & Son, Richmond, Va. A white flint variety; roasting ear June 18; stalk and ear medium size; grain very large and broad; 100 pounds shucked ear corn yield 81.3 pounds grain.

"*Girardeau's Poor Land.*—Seed from W. M. Girardeau, Monticello, Fla. A white dent variety; roasting ear June 28; badly injured by hot winds; stalk large and vigorous; ears long and medium size; 100 pounds shucked ear corn yield 82.9 pounds grain.

"*Hawkins' Improved.*—Seed from Hiram Hawkins, Hawkinsville, Ala. A white gourd seed variety; roasting ear June 28; badly injured by hot winds; stalks large and vigorous; ears short and firm; very long grain; 100 pounds shucked ear corn yield 82.9 pounds grain.

"*Kansas.*—Seed from C. F. Moore, Bryan, Texas. A white dent variety; roasting ear June 21; stalk and ear medium size; 100 pounds shucked ear corn yield 80.4 pounds grain.

"*Large Red.*—Seed from E. V. Finklea, Bryan, Texas. A large red yellow cap dent variety; roasting ear June 20; stalk large and vigorous; ear large, with large red grain; 100 pounds shucked ear corn yield 78.4 pounds grain.

"*Moore's White.*—Seed from C. F. Moore, Bryan, Texas. A white dent variety; roasting ear June 18; stalk and ear medium size; 100 pounds shucked ear corn yield 80 pounds grain.

"*Moore's Yellow.*—Seed from C. F. Moore, Bryan, Texas. A yellow dent variety; roasting ear June 28, injured by hot winds; stalk and ear medium size; 100 pounds shucked ear corn yield 81.7 pounds grain.

"*Mosby's Early Field.*—Seed from J. K. Mosby, Lockhart, Miss. A white gourd seed variety; roasting ear June 18; stalk and ear medium size; 100 pounds shucked ear corn yield 80 pounds grain.

"*North Texas Yellow.*—Seed from O. C. Scott, Melissa, Texas. A yellow dent variety; roasting ear June 28; badly injured by hot winds; ear and stalk medium size; 100 pounds shucked ear corn yield 82.3 pounds grain.

"*Piasa Queen.*—Seed from Plant Seed Company, St. Louis Mo. A yellow dent variety; roasting ear June 28; badly injured by hot winds; stalk and ear medium size; 100 pounds shucked ear corn yield 81.2 pounds grain.

"*Pride of America.*—Seed from T. W. Wood & Son, Richmond, Va. A white dent variety; roasting ear June 20; stalk and ear medium size; 100 pounds shucked ear corn yield 83.4 pounds grain.

"*Texas White.*—Seed from W. R. Cavitt, Bryan, Texas. A white dent variety; roasting ear July 2; badly injured by hot winds; stalk and ear medium size, large grain and small red cob; 100 pounds shucked ear corn yield 80 pounds grain.

"*Virginia Horse Tooth.*—Seed from J. M. Thorburn, New York. A white gourd seed variety; roasting ear June 20; stalk and ear medium size; 100 pounds shucked ear corn yield 86.9 pounds grain.

"*Virginia White Gourd Seed.*—Seed from T. W. Wood & Son, Richmond, Va. A white gourd seed variety; roasting ear July 2; badly injured by hot wind; stalk and ear both large; 100 pounds shucked ear corn yield 84 pounds grain.

"*Welborn's Conscience.*—Seed from Jeff D. Welborn, New Boston, Texas. A white gourd seed variety; roasting ear July 2; badly injured by hot winds; stalk very large and vigorous; ear short but very large; grain extra long and very soft; 100 pounds shucked ear corn yield 82.9 pounds grain.

"*White Giant Normandy.*—Seed from Plant Seed Company, St. Louis, Mo. A white dent variety; roasting ear July 2; badly injured by hot winds; stalk and ears above medium size; 100 pounds shucked ear corn yield 77.1 pounds grain.

"PROLIFIC VARIETIES.

"*Cocke's Prolific.*—Seed from T. W. Wood & Son, Richmond, Va. A white flint variety; roasting ear June 28; badly injured by hot winds; stalk and ear small, from two to four ears on each stalk; 100 pounds shucked ear corn yield 81.7 pounds grain.

"*Blount's Prolific.*—Seed from T. W. Wood & Son, Richmond, Va. A white flint variety; roasting ear June 28; badly injured by hot winds; stalk and ear medium size, from two to four ears on each stalk; 100 pounds shucked ear corn yield 81.7 pounds grain.

"*Mosby's Prolific.*—Seed from J. K. Mosby, Lockhart, Miss. A white gourd seed variety; roasting ear July 2; very badly injured by hot winds; stalk large; ear small, from one to two ears on each stalk; 100 pounds shucked ear corn yield 81.7 pounds grain.

"*Wilson's Prolific.*—Seed from Perry Seed Store, Syracuse, N. Y. A white flint variety; roasting ear June 15; stalk and ear both small; grain broad and short; 100 pounds shucked ear corn yield 78.7 pounds grain.

"DESCRIPTION OF THIRTY-ONE VARIETIES OF COTTON.

"LONG STAPLE.

"*Allen Long Staple.*—Seed from H. C. Prevost, New Orleans, La. Early planting, first bloom June 11, first open boll July 15; late planting, first bloom July 5, first open boll August 28. *Description:* Long limbs put out from near the ground, short limbs (with short joints bearing cotton) put out from these long limbs and from the main stalks. Bolls medium size, long and pointed, distributed on short limbs from main stalk and from the short ones growing out from the long limbs. Plant a vigorous grower, average height 4½ feet, with light green foliage. Yield of cotton seed per acre, 1224 pounds from early planting, showing 29.2 per cent of lint; 1238 pounds from late planting, showing 28.6 per cent of lint. Cost of seed, 75 cents per half bushel.

"*Coltharp's Eureka.*—Seed from Coltharp Bros., Talullah, La. Early planting, first bloom June 12, first open boll July 25; late planting, first bloom July 5, first open boll August 25. *Description:* Resembles Allen Long Staple in main characteristics. Yield of seed cotton per acre, 1274 pounds early planting, showing 31.9 per cent of lint; 1404 pounds from late planting, showing 29.4 per cent of lint. Cost of seed, $1 per half bushel.

"*Dalkeith's Eureka.*—Seed from D. G. Humphreys, Dalkeith, La. Late planting, first bloom July 6, first open boll August 28. *Description:* Stalk very open, with long limbs and long joints, bolls small; average height of plant, 3½ feet, with very light green foliage. Yield of seed cotton per acre, 1140 pounds from late planting, showing 28.9 per cent of lint. No early planting of this variety. Cost of seed, $1 per half bushel.

"*Hurley's Choice.*—Seed from T. C. Hurley, Pottsboro, Texas. Early planting, first bloom June 12, first open boll July 30; late planting, first bloom July 5, first open boll August 27. *Description:* Stalk very open, with long limbs, small bolls; average height of plant, 4 feet; vigorous, with dark green foliage. Yield of seed cotton per acre, 1027 pounds from early planting, showing 28.6 per cent of lint; 1338 pounds from second planting, showing 29.2 per cent of lint. Seed donated.

"*Jones' Wonderful.*—Seed from J. H. Jones, Herndon, Ga. Early planting, first bloom June 11, first open boll July 27; late planting, first bloom July 5, first open boll August 25. *Description:* Long limbs, with long joints; bolls large, long and pointed; plant a vigorous grower; average height 4½ feet, with light green foliage. Yield of seed cotton per acre, 1123 pounds from early planting, showing 29.6 per cent of lint; 1186 pounds from late planting, showing 29.9 per cent of lint. Cost of seed, $1 per half bushel.

"*Matthews' Extra Long Staple.*—Seed from J. A. Matthews, Holly Springs, Miss. Early planting, first bloom June 13, first open boll July 30; late planting, first bloom July 8, first open boll August 27. *Description:* Resembles Allen's Long Staple in main characteristics. Yield of seed cotton per acre, 1006 pounds from early planting, showing 30.5 per cent of lint; 1270 pounds from late planting, showing 28.5 per cent of lint. Cost of seed, $1 per half bushel.

"*Southern Hope.*—Seed from E. J. McGehee, Pinckneyville, Miss. Early planting, first bloom June 11, first open boll July 26; late planting, first bloom July 4, first open boll August 28. *Description:* Stalk pyramidal in shape, long drooping limbs with long joints, three to six bolls on each limb, bolls medium size, long and pointed, plant large and vigorous, average height 5 feet, with light green foliage. Yield seed cotton per acre, 1041 pounds from early planting, showing 28.7 per cent of lint; 1518 pounds from late planting, showing 27.7 per cent of lint. Seed cost $2 per half bushel.

"LONG LIMBED VARIETIES.

"*Beck's Rig Boll.*—Seed from C. B. Beck, Bryan, Texas. Early planting, first bloom June 8, first open boll July 28; late planting, first bloom July 8, first open boll August 30. *Description:* Resembles Bohemian in main characteristics. Yield seed cotton per acre, 1041 pounds from early planting, showing 35 per cent of lint; 944 pounds from late planting, showing 30.6 per cent of lint. Cost of seed, 75 cents per half bushel.

"*Bohemian.*—Seed from Rudolph Simmons, College Station, Texas. Early planting, first bloom June 11, first open boll July 26; late planting, first bloom July 5, first open boll August 27. *Description:* Stalk low, broad and open, with long limbs, bolls very large and round, usually containing five locks of cotton each, plant small, average height 3½ feet, with dark green foliage. Yield seed cotton per acre, 923 pounds from early planting, showing 31.6 per cent of lint; 1008 pounds from late planting, showing 31.5 per cent of lint. Cost of seed, 25 cents per half bushel.

"*Dickson's Improved.*—Seed from Capers Dickson, Oxford, Ga. Early planting first bloom June 7, first open boll July 25; late planting, first bloom July 7, first open boll August 28. *Description:* Stalk open, long limbs with very short joints, bolls medium size and round, average height of plant 3½ feet, with light green foliage. Yield seed cotton per acre from early planting 1166 pounds, showing 29 per cent of lint; 1392 pounds from late planting, showing 29.7 per cent of lint. Cost of seed, $1.25 per half bushel.

"*Dooley's Improved.*—Seed from W. B. Dooley, Wharton, Texas. Early planting, first bloom June 17, first open boll July 30; late planting, first bloom July 4, first open boll August 27. *Description:* Resembles Marston in main characteristics. Yield seed cotton per acre, 1111 pounds from early planting, showing 30.1 per cent of lint; 1026 pounds from late planting, showing 27.7 per cent of lint. Seed donated.

"*Jones' Improved.*—Seed from V. B. Hardy, Bryan, Texas. Early planting, first bloom June 9, first open boll July 24; late planting, first bloom July 5, first open boll August 27. *Description:* Stalk small, low and open, with long limbs, bolls round and above medium size, average height of plant 3 feet, with dark green foliage. Yield of seed cotton per acre, 1014 pounds from early planting, showing 35.6 per cent of lint; 1176 pounds from late planting, showing 36 per cent of lint. Cost of seed, 75 cents per half bushel.

"*King's Improved.*—Seed from T. J. King, Louisburg, N. C. Early planting, first bloom June 11, first open boll July 21; late planting, first bloom July 7, first open boll August 25. *Description:* Stalk very open, with long limbs, bolls small, average height of plant 2½ feet, with very light green foliage. Yield seed cotton per acre, 1174 pounds from early planting, showing 35.6 per cent of lint; 998 pounds from late planting, showing 32.7 per cent of lint. Cost of seed, $1 per half bushel.

"*Marston.*—Seed from H. C. Prevost, New Orleans, La. Early planting, first bloom June 16, first open boll July 30; late planting, first bloom July 9, first open boll August 30. *Description:* Stalk very open, long limbs put out from near the ground, limbs of medium length put out from the main stock and the long limbs, bolls medium size, plant vigorous, average height 4 feet, with light green foliage. Yield seed cotton per acre, 1193 pounds from early planting, showing 33.6 per cent of lint; 1354 pounds from late planting, showing 32 per cent of lint. Cost of seed, 50 cents per half bushel.

"*Peeler.*—Seed from H. C. Prevost, New Orleans, La. Early planting, first bloom June 11, first open boll July 26; late planting, first bloom July 8, first open boll August 30. *Description:* Stalk very large and open, with long drooping limbs, bolls medium size, long and pointed, plant a vigorous grower, average height 5½ feet, with light green foliage. Yield seed cotton per acre, 1419 pounds from early planting, showing 28.4 per cent of lint; 1190 pounds from late planting, showing 27.9 per cent of lint. Cost of seed, $1 per half bushel.

"*Peterkin Improved.*—Seed from Alexander Drug and Seed Company, Augusta, Ga. Early planting, first bloom June 16, first open boll July 26; late planting, first bloom July 7, first open boll August 28. *Description:* Stalk very open, with long limbs, bolls medium size, average height of plant 4½ feet, with light green foliage. Yield of seed cotton per acre, 1349 pounds from early planting, showing 34.3 per cent of lint; 1478 pounds from late planting, showing 32 per cent of lint. Cost of seed, 65 cents per half bushel.

"*Peterkin Limbed Cluster.*—Seed from Alexander Drug and Seed Company, Augusta, Ga. Early planting, first bloom June 16, first open boll July 25; late planting, first bloom July 6, first open boll August 25. *Description:* Long limbs with short joints, bolls very small, plant a vigorous grower, average height 4½ feet, with dark green foliage. Yield per acre seed cotton, 930 pounds from early planting, showing 33.1 per cent of lint; 1908 pounds from late planting, showing 32.4 per cent of lint. Cost of seed, 25 cents per half bushel.

"*Petit Gulf.*—Seed from H. C. Prevost, New Orleans, La. Early planting, first bloom June 16, first open boll July 28; late planting, first bloom July 9, first open boll September 4. *Description:* Resembles Peeler in main characteristics. Yield seed cotton per acre, 894 pounds from early planting, showing 32.5 per cent of lint; 1442 pounds from late planting, showing 30.1 per cent of lint. Cost of seed, 38 cents per half bushel.

"*Sure Fruit.*—Seed from W. M. Girardeau, Monticello, Fla. Early planting, first bloom June 16, first open boll July 30; late planting, first bloom July 5, first open boll August 28. *Description:* Resembles Marston in main characteristics. Yield seed cotton per acre, 1292 pounds from early planting, showing 33.6 per cent of lint; 1508 pounds from late planting, showing 31.7 per cent of lint. Cost of seed, $3 per half bushel.

"*Tennessee Gold Dust.*—Seed from Jenkins & Trobaugh, Stewartville, Tenn. Early planting, first bloom June 11, first open boll July 15; late planting, first bloom July 5, first open boll August 25. *Description:* Stalk very open, with long limbs, bolls medium size, average height of plant 3 feet, with very light green foliage. Yield seed cotton per acre, 940 pounds from early planting, showing 32.9 per cent of lint; 1198 pounds from late planting, showing 28.1 per cent of lint. Seed cost $4 per half bushel.

"*Tennessee Gold Dust.*—Seed from T. C. Hurley, Pottsboro, Texas. Early planting, first bloom June 12, first open boll July 27; late planting, first bloom July 6, first open boll August 25. *Description:* Seed badly mixed; yield seed cotton per acre, 982 pounds from early planting, showing 32.9 per cent of lint; 1514 pounds from late planting, showing 30 per cent of lint. Seed donated.

"*Texas Storm Proof.*—Seed from W. J. Smilie, Baileyville, Texas. Early planting, first bloom June 13, first open boll July 25; late planting, first bloom July 5, first open boll August 28. *Description:* Stalk very large, with very long limbs, bolls large and round, average height of plant 4½ feet, with light green foliage. Yield seed cotton per acre, 674 pounds from early planting, showing 32.2 per cent of lint; 1102 pounds from late planting, showing 32 per cent of lint. Seed donated.

"*Truitt's Improved.*—Seed from G. W. Truitt, La Grange, Ga. Early planting, first bloom June 17, first open boll July 28; late planting, first bloom July 8, first open boll August 29. *Description:* Stalk low, broad and open, with long limbs with short joints, often bearing bolls on opposite sides of the limb; bolls medium size, round; plant vigorous, with very large dark green foliage. Yield of seed cotton per acre, 1059 pounds from early planting, showing 31.3 per cent of lint; 1502 pounds from late planting, showing 28.7 per cent of lint. Cost of seed, $1 per half bushel.

"*Tyler's Limbed Cluster.*—Seed from Alexander Drug and Seed Company, Augusta, Ga. Late planting, first bloom July 16, first open boll September 6. *Description:* Stalk very open; long limbs, with very short joints; bolls small; average height 5½ feet; plant vigorous, with light green foliage. Yield seed cotton per acre, 1510 pounds from late planting, showing 29.4 per cent lint. No early planting of this variety. Seed donated.

"CLUSTER VARIETIES.

"*Beck's Prolific.*—Seed from C. B. Beck, Bryan, Texas. Early planting, first bloom June 13, first open boll July 25; late planting, first bloom July 5, first open boll August 27. *Description:* Long limbs put out from near the ground, short limbs (with short joints bearing cotton) put out from these long limbs from the main stalks; bolls medium size and round; plant small; average height of plant 3 feet, with light green foliage. Yield seed cotton per acre, 1011 pounds from early planting, showing 29 per cent of lint; 1486 pounds from late planting, showing 31.6 per cent of lint. Cost of seed, 75 cents per half bushel.

"*Cochran's Prolific.*—Seed from Mark W. Johnson Seed Company, Atlanta, Ga. Early planting, first bloom June 15, first open boll July 28; late planting, first

bloom July 6, first open boll August 27. *Description:* Resembles Beck's Prolific in main characteristics. Yield seed cotton per acre, 1069 pounds from early planting, showing 29.2 per cent of lint; 1504 pounds from late planting, showing 30.7 per cent of lint. Cost of seed, 90 cents per half bushel.

"*Drake's Cluster.*—Seed from R. W. Drake, Laneville, Ala. Early planting, first bloom June 16, first open boll July 24; late planting, first bloom July 5, first open boll August 25. *Description:* Resembles Beck's Prolific in main characteristics. Yield seed cotton per acre, 1251 pounds from early planting, showing 31.5 per cent of lint; 1404 pounds from late planting, showing 31.2 per cent of line. Cost of seed, $1 per half bushel.

"*Hawkins' Improved.*—Seed from Alexander Drug and Seed Company Augusta, Ga. Early planting, first bloom June 11, first open boll July 25; late planting, first bloom July 8, first open boll August 28. *Description:* Resembles Beck's Prolific in main characteristics. Yield of seed cotton per acre, 1229 pounds early planting, showing 29.3 per cent lint; 1248 pounds from late planting, showing 30.1 per cent of lint. Cost of seed, $1 per half bushel.

"*Herlong.*—Seed from H. C. Prevost, New Orleans, La. Early planting, first bloom June 15, first open boll July 30; late planting, first bloom July 11, first open boll August 30. *Description:* Resembles Beck's Prolific in main characteristics. Yield seed cotton per acre, 1109 pounds from early planting, showing 29.4 per cent of lint; 1760 pounds from late planting, showing 30.1 per cent of lint. Cost of seed, 75 cents per half bushel.

"*Peerless.*—Seed from H .C. Prevost, New Orleans, La. Early planting, first bloom June 11, first open boll July 31; late planting, first bloom July 7, first open boll August 28. *Description:* Stalk open, pyramidal in shape, long limbs with very short joints, bolls medium size, average height of plant 3½ feet, with light green foliage. Yield per acre seed cotton, 1230 pounds from early planting, showing 28.4 per cent of lint; 1248 pounds from late planting, showing 30.8 per cent of lint. Cost of seed, $1 per half bushel.

"*Welborn's Pet.*—Seed from Jeff D. Welborn, New Boston, Texas. Early planting, first bloom June 11, first open boll July 21. *Description:* Long limbs put out from near the ground, bolls form in clusters along the main stalk and long limbs, average height of plant 3½ feet, with light green foliage. Yield seed cotton per acre, 1172 pounds, showing 32.7 per cent of lint. No late planting of this variety. Seed donated.