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Report of the work at the Holly Springs Station for 1907

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REPORT OF THE WORK AT THE HOLLY SPRINGS STATION FOR 1907.

By C. T. AMES.

INTRODUCTION.

This Bulletin contains fertilizer results under cotton, corn, and cowpeas; also the information so far obtained with grasses and forage crops.

FERTILIZER TEST WITH CORN.

Thirty plats and thirty duplicate plats of one twentieth of an acre each (Six rows four feet wide and ninety-two feet long) were fertilized as shown in the following table, and planted to Mosby's Prolific Seed Corn, April twenty-seventh.

Weather conditions necessitated a second planting, May twentieth.

Soil.—The soil used was a brownish loam rolling upland which varied somewhat in fertility.

An attempt was made by the use of stable manure to equalize the soil's productiveness as far as possible.

The soil on which the thirty plats were planted, also the first fifteen plats in duplicate plats, grew a good crop of cowpeas the year before.

The remaining fifteen plats were on soil which was planted in corn the year before.

Following is a table giving results, and a calculated yield per acre:

RESULTS WITH FERTILIZERS UNDER CORN.

Amount of Fertilizers Calculated in Pounds Per Acre.

Number of Plat	200 Lbs. per Acre.	Yield in Bushels per Acre	Duplicate Plats—Yield in Bushels per Acre
1	No Fertilizer	34.16	20.55
2	200 lbs. Cottonseed Meal	38.05	22.5
3	200 lbs. Acid Phosphate	32.50	31.38
4	200 lbs. Kainit	30.00	26.38
5	No Fertilizer	29.72	31.66
6	100 lbs. Acid Phosphate 100 lbs. Cottonseed Meal	35.27	26.38
7	100 lbs. Cottonseed Meal 100 lbs. Kainit	30.55	20.00
8	100 lbs. Acid Phosphate 100 lbs. Kainit	29.16	26.66
9	120 lbs. Acid Phosphate 40 lbs. Cottonseed Meal 40 lbs. Kainit	23.61	29.72
10	No Fertilizer	21.66	3.61
22	150 lbs. Cottonseed Meal 50 lbs. Acid Phosphate	23.61	11.11
23	100 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	21.66	12.77
24	50 lbs. Cottonseed Meal 150 lbs. Acid Phosphate	23.61	12.50
25	No Fertilizer	26.94	12.22
30	400 lbs. Ground Phosphate Rock	32.08	

Number of Plat	400 Lbs. per Acre.	Yield in Bushels per Acre	Duplicate Plats—Yield in Bushels per Acre
11	No Fertilizer	28.05	29.44
12	400 lbs. Cottonseed Meal	33.61	28.05
13	400 lbs. Acid Phosphate	37.50	29.72
14	400 lbs. Kainit	28.33	18.05
15	No Fertilizer	25.83	16.94
16	200 lbs. Acid Phosphate 200 lbs. Cottonseed Meal	18.05	13.88
17	200 lbs. Cottonseed Meal 200 lbs. Kainit	21.66	5.55
18	200 lbs. Acid Phosphate 200 lbs. Kainit	23.05	2.22
19	240 lbs. Acid Phosphate 80 lbs. Cottonseed Meal 80 lbs. Kainit	21.38	3.61
20	No Fertilizer	17.22	12.22
26	300 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	12.50	21.11
27	200 lbs. Acid Phosphate 200 lbs. Cottonseed Meal	26.38	21.38
28	100 lbs. Cottonseed Meal 300 lbs. Acid Phosphate	29.44	21.66
29	133 1-3 lbs. Cottonseed Meal 133 1-3 lbs. Acid Phosphate 133 1-3 lbs. Kainit	29.16	26.94
31	800 lbs. Ground Phosphate Rock	27.22	

Remarks.—During continued heavy rains following shortly after fertilizing and planting the plats, a portion of the fertilizer may have been lost by soil washing. All plats on soil after cowpeas, which were fertilized with acid phosphate, or cottonseed meal, or a mixture of the two, were very promising until checked by drought. At no stage of growth in plats Nos. 10, 15 to 20, and 22 to 25, in duplicate plats, was there any prospect for fruit. These plats mentioned were on soil after corn the year before. Two months protracted drought, before and during the fruiting season; also, variation in soil, affected results very materially.

Conclusions.—Both available phosphorous and nitrogen are deficient.

With the assistance of field notes it would appear, that a mixture 100 pounds Acid Phosphate and 100 pounds cottonseed meal, per acre, will give good results.

On more fertile soils, Acid Phosphate alone 200 pounds to 400 pounds per acre, as the soils' fertility increases, will give good results.

More profitable results from the use of fertilizers can be obtained on land grown in cowpeas the year before.

It is not profitable to grow corn on thin uplands.

FERTILIZER TEST WITH COTTON.

Thirty plats of one twentieth of an cre each, containing six rows, four feet wide and ninety-two feet long, were fertilized as shown in the following table, and planted to Cook's Improved Cotton Seed, April 27th.

Weather conditions necessitated a second planting May 20th.

Soil.—Brownish loam, slightly rolling table land.

The following table gives the quantity and kind of fertilizers used; also dates of each picking, and a calculated yield per acre. It also contains an estimate value of crop per acre, on basis of three cents per pound for seed cotton:

FERTILIZER TEST WITH COTTON.

Amount of Fertilizer calculated in pounds per acre.

Number of Plats	200 pounds per acre.	Picked Sept. 21	Picked Oct. 3	Picked Oct. 17	Picked Nov. 9-16	Picked Jan. 21	Total	Yield per Acre	Value at 3c per lb. for Seed Cotton
1	No Fertilizer	4	6	8	19	6	43	860	$25.80
2	200 lbs. Cottonseed Meal	9	9	10	22	7	57	1140	34.20
3	200 lbs. Acid Phosphate	10	11	12	23	4	60	1200	36.00
4	200 lbs. Kainit	5	6	8	21	7	47	940	28.20
5	No Fertilizer	4	6	8	20	5	43	860	25.80
6	100 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	8	11	9	25	4	57	1140	34.20
7	100 lbs. Cottonseed Meal 100 lbs. Kainit	5	7	8	19	5	44	880	26.40
8	100 lbs. Acid Phosphate 100 lbs. Kainit	7	8	9	21	4	49	980	29.40
9	120 lbs. Acid Phosphate 40 lbs. Cottonseed Meal 40 lbs. Kainit	9	9½	10	21	2	51½	1030	30.90
10	No Fertilizer	7	6	6	16	3	38	760	22.80
22	150 lbs. Cottonseed Meal 50 lbs. Acid Phosphate	9	8	8	18	2	45	900	27.00
23	100 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	10	8	6	16	1	41	820	24.60
24	50 lbs. Cottonseed Meal 150 lbs. Acid Phosphate	5	7	9	35	0	56	1120	33.60
25	No Fertilizer	0	½	7	27	0	34½	690	20.70
30	400 lbs. Ground Phosphate Rock	0	1	7	20	0	28	560	16.80

Number of Plats	400 pounds per acre.	Picked Sept. 21	Picked Oct. 3	Picked Oct. 17	Picked Nov. 9-16	Picked Jan. 21	Total	Yield per Acre	Value at 3c per lb. for seed Cotton
11	No Fertilizer	2	3	5	13	6	29	580	$17.40
12	400 lbs. Cottonseed Meal	6	7	9	14	3	39	780	23.40
13	400 lbs. Acid Phosphate	9	7	8	19	4	47	940	28.20
14	400 lbs. Kainit	3	6	7	18	5	39	780	23.40
15	No Fertilizer	4	5	9	18	4	40	800	24.00
16	200 lbs. Cottonseed Meal 200 lbs. Acid Phosphate	9	10	10	26	3	58	1160	34.80
17	200 lbs. C-S. Meal 200 lbs. Kainit	5	9	11	25	4	54	1080	32.40
18	200 lbs. Acid Phosphate 200 lbs. Kainit	10	11	12	23	4	60	1200	36.00
19	240 lbs. Acid Phosphate 80 lbs. C-S. Meal 80 lbs. Kainit	12	10	11½	26	4	63½	1270	38.10
20	No Fertilizer	5	7½	6	20	4	42½	850	25.50
26	300 lbs. C-S. Meal 100 lbs. Acid Phosphate	14½	10	9	22	3	58½	1170	35.10
27	200 lbs. C-S. Meal 200 lbs. Acid Phosphate	15	10	9	24	1	59	1180	35.40
28	100 lbs. Cottonseed Meal 300 lbs. Acid Phosphate	8	7	7	31	0	53	1060	31.80
29	133 1-3 lbs. C-S. Meal 133 1-3 lbs. Acid Phos. 133 1-3 lbs. Kainit	5	10	8	33	0	56	1120	33.60
31	800 lbs. Ground Phosphate Rock	2	8	12	24	0	46	920	27.60

Remarks.—With plats located in the field, as indicated in the table, and using the results on blank plats as a basis, soil variations can easily be traced.

The soil on which plats thirty and thirty-one were located is below the average. The continued drought during August and September caused some shedding of bolls.

Conclusions.—Results plainly indicate that available Phosphorous is deficient, and that an application of Acid Phosphate can be made very profitable, when a sufficient quantity of Nitrogen is present.

It appears that a mixture of fifty pounds of Cottonseed Meal and one hundred and fifty pounds of Acid Phosphate is the safest and best fertilizer for cotton, for this class of soil.

Indications are, that available Potash is present in sufficient quantities in these soils, and that it would be a waste of funds to add more.

FERTILIZER TESTS WITH COWPEAS.

Five plats and five duplicate plats of one twentieth of an acre each, were planted, in rows, June 17th. The soil was a thin upland yellowish loam.

The following table gives the quantity and kind of fertilizer used, and yield of vine in pounds per acre:

No. Plats		Pounds of Vines Per Acre.	Duplicate Plats, Yield Vines Per Acre.
1	No Fertilizer	576	1044
2	200 lbs. Acid Phosphate	1656	1440
3	400 lbs. Ground Phosphate Rock	1572	1452
4	200 lbs. Kainit	852	963
5	100 lbs. Acid Phosphate 100 lbs. Kainit	1464	1380

Remarks.—Soil on plat No. 1 below the average.

Conclusion.—Available Phosphorous is deficient.

An application of from one hundred to two hundred pounds of Acid Phosphate will increase the yield very materially.

Available Potash is present in sufficient quantities for all practical purposes.

GRASSES AND FORAGE CROPS.

On March 29th, 1907, the following grasses and forage crops were planted on brownish loam upland, viz.: Red Clover, Alsyke Clover, White Clover, Crimson Clover, Alfalfa, Melilotus, Lespedeza, Spring Vetch, Johnson Grass, Bermuda Grass, Orchard Grass, Kentucky Blue Grass, Rye Grass, Red Top, or Herds' Grass, and Sanfoin.

Forty-eight plats were employed in this test. Fertilizers were used on some plantings, and various seed mixtures were planted.

An excellent stand was secured on all plantings. At the end of the summer season but few plats remained.

Bermuda Grass made a perfect sod, but was of slow growth.

Lespedeza, or Japan Clover, did well. This plant makes a profitable growth on almost any soil in this section. Its growth should be encouraged on all waste lands as a soil improver, and for pasture, and on better classes of land as a hay crop.

A mixture of Bermuda and Lespedeza makes a most excellent pasture.

Red Top.—Better results were obtained in fall planting for pasture than results in plats would indicate. On thin land it was an absolute failure; on low lands and land of ordinary fertility, fair results were obtained.

Hairy Vetch.—In fall planting with oats on fertile spots, a magnificent growth was obtained. On thin land it proved a failure. No inoculation of soil was made.

Red Clover.—On plat where ten tons of barnyard manure and 1,000

pounds of lime per acre, were used, one cutting fourteen inches high was secured. On plats not so treated, the growth was poor.

Alfalfa.—Out of sixteen plats, only two plats which were cultivated survived the season. These two plats were cultivated after each rain and while a perfect stand now remains, but little growth was made.

Melilotus.—Slow growth was made during the entire season. Indications are that lime is beneficial.

Orchard Grass, Kentucky Blue Grass, and Crimson Clover, with a little encouragement would grow.

White Clover, Alsyke Clover, Rye Grass, Spring Vetch (Spring planting) and Sanfoin made a failure.

Johnson Grass made but poor growth.