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Local Fertilizer Experiments With Cotton in South Alabama in 1913

BY

J. F. DUGGAR,
J. T. WILLIAMSON, and
L. J. HAWLEY.

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LOCAL FERTILIZER EXPERIMENTS WITH COTTON IN SOUTH ALABAMA IN 1913

BY

J. F. DUGGAR, J. T. WILLIAMSON, L. J. HAWLEY

SUMMARY.

Bulletin No. 174 records the results of fertilizer experiments with cotton conducted by the Alabama Experiment Station in the counties of the southern half of Alabama in 1913.

Extremely dry weather and other unfavorable conditions made some of these experiments inconclusive. The following summary is based on only the conclusive experiments.

In 10 out of 23 conclusive experiments, cotton seed meal was more effective than either acid phosphate or kainit.

In 4 experiments, phosphate was more effective than kainit; in 5 it was about equally as important as kainit; and in 6 tests, it was less effective than kainit, though needed; thus in 65 per cent of these experiments, acid phosphate was needed to a greater or less extent.

In 11 experiments kainit was more important than phosphate, and in 5 instances it was about equally as effective as phosphate; that is, in 70 per cent of these experiments, kainit was needed to a greater or less extent.

This table shows that, as a rule, the complete fertilizers (Plots 9, 10 and 12) were more profitable than fertilizers applied singly or in pairs. The complete fertilizers were also the most profitable applications in 1911 and in 1912 in Southern Alabama.

In the general average it was more effective in all three years to apply 200 pounds of kainit in a complete fertilizer (Plot 9) than to use 100 pounds of kainit (Plot 10). However, in 1911, a larger profit was made when 100 pounds of kainit was used.

The average of the conclusive experiments in both 1912 and 1913 shows that 200 pounds of cotton seed meal applied before planting was practically equal in effect to 100 pounds of nitrate of soda applied after the plants were six inches high.

The following table shows the average increase in seed cotton per acre and the average profit, when all of these 23 conclusive experiments are averaged.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Average increase over unfertilized plot; seed cotton per acre.	Average profit from fertilizer per acre.
			Lbs.	
1	200	C. S. Meal	125	\$ 2.51
2	240	Acid Phosphate	84	1.96
3	000	No fertilizer	-----	-----
4	200	Kainit	156	5.46
5	200	C. S. Meal	201	4.15
	240	Acid Phosphate		
6	200	C. S. Meal	263	7.10
	200	Kainit		
7	000	No fertilizer	-----	-----
8	240	Acid Phosphate	199	5.70
	200	Kainit		
9	200	C. S. Meal	327	8.30
	240	Acid Phosphate		
	200	Kainit		
10	200	C. S. Meal	275	7.17
	240	Acid Phosphate		
	100	Kainit		
11	000	No fertilizer	-----	-----
12	240	Acid Phosphate	276	7.16
	100	Kainit		
	100	Nitrate of Soda (late)		

Introductory.

The chief object of these local fertilizer experiments or soil tests has been to ascertain the best fertilizer combination of fertilizers for cotton, growing on each of the principal soils of the southern half of Alabama.

The results recorded in this bulletin were obtained in fertilizer experiments conducted by funds appropriated by the Legislature of Alabama, in February 1911, to the Experiment Station for making local experiments with crops, fertilizers, fruits, live stock, insects, plant diseases, etc.

This bulletin deals only with fertilizer experiments carried to a conclusion in 1913 in the southern half of the State. For convenience the counties grouped together in this bulletin are those lying south of or within the Central Prairie or Lime Region.

The results of fertilizer experiments made in the counties lying

wholly north of the Central Prairie Region will appear in a later bulletin.

Local fertilizer tests constitute only one of many lines of experiments instituted in 1911 by the Alabama Experiment Station with the support of State funds.

Local fertilizer experiments as now conducted are made by farmers especially recommended as being men likely to take the necessary pains to secure accurate results.

Small lots of carefully weighed and mixed fertilizers were supplied to each experimenter. Detailed instructions as to how to conduct the experiment and blank forms for reporting results were also furnished. Representatives of the Station inspected the experiments here published as often as practicable.

The directions sent to each experimenter stated that the land employed for this test should be level and uniform, not manured in recent years, not in cowpeas the preceding year, and that it should be representative of large soil areas in its vicinity. The need of perfect uniformity and standard treatment for all plots (except as to kind of fertilizer used) was emphasized.

Fertilizers were applied in the usual manner—that is, drilled before planting, except nitrate of soda which was directed to be applied when the plants were 6 to 10 inches high.

Bulletins this far published in this series detailing the results of local fertilizer experiments with cotton on this uniform plan are the following:

For South Alabama—Bulletins No. 160, 169, and 174.

For North Alabama—Bulletins No. 162, 170, and (in press) 175.

The reader should bear in mind that there are great numbers of different soils in Alabama, and that even the same soil would give different results in different years, depending on how it had been cropped, fertilized, and cared for in the year or two immediately preceding the test.

It is the purpose of the authors in later years to publish bulletins classifying the soils on which all these tests are made and drawing conclusions relative to the needs of each class of soils. However, before this can be safely done, these experiments must be often repeated, so that the average results may teach clearly the fertilizer requirements of each distinct type of soil.

Averaging the results obtained on dissimilar soils will not afford

the desired information. Neither will chemical analysis of the soil indicate what fertilizers are needed.

WEATHER CONDITIONS.

In most localities the summer of 1913 was an extremely dry one; especially hurtful was the drought about August.

The average rainfall in the part of Alabama covered by these experiments is given below by months, according to data furnished by the Alabama Weather Service.

In 1913 killing frost occurred much earlier than usual, Oct. 21.

	Inches		Inches		Inches		Inches
Jan.	4.97	Apr.	2.47	July	5.84	Oct.	2.24
Feb.	5.45	May	2.42	Aug.	2.58	Nov.	1.41
Mar.	11.59	June	3.51	Sept.	7.88	Dec.	

LOCATION OF EXPERIMENTS.

The following list gives the name and address of each experimenter who has reported the results of fertilizer experiments made in 1913 in the part of the State indicated, together with the page of this bulletin where the results may be found:

COUNTY	POST OFFICE	NAME	Page
Butler	Greenville	Gradon, E. L.	173
Choctaw	Butler	Covington, J. L.	165
Choctaw	Butler	Sparrow, R. F.	188
Choctaw	Lisman	Ezell, B. J.	190
Choctaw	Silas	Edgar, W. G.	163
Clarke	Grove Hill	Calhoun, J. Winters	168
Clarke	Thomasville	Hearron, R. L.	166
Coffee	Elba	Smith, O. C.	190
Conecuh	Belleville	Braxton, J. J.	190
Covington	Andalusia	Rushton, W. N.	177
Crenshaw	Luverne	Hawkins, F. L.	187
Dale	Ozark	Byrd, J. W.	183
Elmore	Eclectic	Pittman, A. M.	190
Elmore	Tallasse	Patterson, W. A.	190
Escambia	Atmore	Jordon, I.	174
Escambia	Brewton	Maddox, Silas	176
Geneva	Hartford	Grantham, G. E.	180
Greene	Eutaw	Lett, W. L. and R. C.	190
Hale	Greensboro	Tutwiler, P. A., Jr.	161
Henry	Headland	Wilkinson, C. F.	190
Houston	Dothan	Hatcher, D. M.	185
Lowndes	Letohatchie	Mitchell, J. B., Jr.	154
Marengo	Demopolis	Bogges, J. P. and N. W.	156
Marengo	Gallion	Jackson, W. W.	190
Marengo	Linden	Scogin, J. T.	158
Monroe	Monroeville	Holloway, J. L.	170
Perry	Marion	Thomas, G. W.	190
Pike	Troy	Gibson, N. T.	181
Russell	Hooks	Mitchell, R. M.	190

COUNTY	POST OFFICE	NAME	Page
Sumter	Geiger	Gilbert, E. A.	159
Sumter	Geiger	Payne, A. J.	153
Washington	LeRoy	Pruitt, A. D.	167
Wilcox	Camden	Cook, G. M.	190
Wilcox	McWilliams	Chappelle, R. F.	171

THE FERTILIZERS USED.

The following prices are used, as representing approximately the average cash price in local markets during the last few years:

These prices are somewhat above the prices paid by this Station.

	Per Ton
Acid Phosphate (16 per cent. available)	\$14.00
Cotton seed meal	\$30.00
Kainit	\$14.00
Nitrate of soda	\$60.00

Prices naturally vary in different localities. Any one can substitute the cost of fertilizers in his locality for the prices given above.

In each experiment three plots were left unfertilized, these being plots 3, 7, and 11. When these yields differed widely the experiment was classed as inconclusive. The increase on plots 4 to 6 is calculated on the assumption that the gradation in fertility is uniform from plots 3 to 7; likewise the increase is calculated for plots 8 to 10 inclusive.*

PRICE ASSUMED FOR SEED COTTON.

The price assumed is \$20.00 per ton for seed, and 13 cents per pound for lint. This is equal to 5 cents per pound for seed cotton turning out $33\frac{1}{3}$ per cent. of lint. Deducting $\frac{6}{10}$ cents per pound as the average cost of picking and ginning, and we have left 4.4 cents as the net value per pound of the increase of seed cotton due to fertilizers. This latter is the figure used in all financial calculations.

*For the standard method of calculation employed, see Alabama Station Bulletins 160 or 162.

Pounds per acre of fertilizers; nitrogen, phosphoric acid, and potash used and composition of each mixture.

Plot No.	FERTILIZERS		MIXTURE CONTAINS			COST OF FERTILIZERS	
	Amount per acre	KIND OF FERTILIZER	Nitrogen	† Available phosphoric acid	Potash	Per ton	Per acre
1	200	Cotton seed meal-----	Lbs. 13.58	Lbs. 5.76	Lbs. 3.54	\$30 00	\$3.00
		<i>In 100 lbs. c. s. meal*</i> -----	67.9	2.88	1.77		
2	240	Acid phosphate-----		38.40		14.00	1.68
		<i>In 100 lbs. acid phos</i> -----		16.00			
4	200	Kainit-----			24.60	14 00	1.40
		<i>In 100 lbs. kainit</i> -----			12.30		
5	200	Cotton seed meal-----	13.58	44.16	3.54	21.27	4.68
		Acid phosphate-----					
6	240	<i>In 100 lbs. above mixt</i> -----	3.09	10.04	0.80		
		200 Cotton seed meal-----	13.58	5.76	28.14	22.00	4.40
200 Kainit-----							
8	240	<i>In 100 lbs. above mixt</i> -----	3.39	1.44	7.03		
		200 Acid phosphate-----				13.99	3.08
9	200	Kainit-----					
		<i>In 100 lbs. above mixt</i> -----		8.73	5.59		
10	240	Cotton seed meal-----	13.58	44.16	28.14	19.00	6.08
		Acid phosphate-----					
12	200	Kainit-----					
		<i>In 100 lbs. above mixt</i> -----	2.12	6.90	4.40		
10	200	Cotton seed meal-----	13.58	44.16	15.84	19.93	5.38
		Acid phosphate-----					
12	100	Kainit-----					
		<i>In 100 lbs. above mixt</i> -----	2.51	8.18	2.93		
12	100	Acid phosphate-----	14.00	16.00	12.30	24.45	5.38
		Nitrate of soda-----					
		<i>In 100 lbs. above mixt</i> -----	3.18	8.73	2.80		

*Average of many analyses.

†Counting all the phosphoric acid in cotton seed meal as available.

Those farmers who are more accustomed to the word ammonia than to the term nitrogen, can change the figures for nitrogen into their ammonia equivalents by multiplying by $1\frac{3}{11}$.

SUMTER COUNTY, 3 MILES NORTHWEST OF
GEIGER.

A. J. PAYNE

Dark prairie upland (Houston clay).

The stand was uniform. This land is subject to rust, but no damage was reported from this disease in 1913. Weevils were present but not in sufficient numbers to be harmful.

The largest profit, \$7.93, or 566 per cent. on the investment in fertilizer, was obtained from an application of 200 pounds of kainit on Plot 4. Profits of \$6.34 and \$6.25 were made on Plots 6 and 8 respectively, both of which were fertilized with a mixture containing 200 pounds of kainit.

After excluding Plot 9, which was slightly injured by shade, the largest average increase, 177 pounds of seed cotton per acre, is attributable to an application of kainit; the second largest, 101 pounds of seed cotton per acre, to cotton seed meal. Acid phosphate gave an average increase of 69 pounds of seed cotton per acre.

Cotton seed meal applied before planting was slightly more profitable than was nitrate of soda applied when plants were 6 to 8 inches high. This was also true of an experiment conducted by Mr. Payne on similar soil in 1912.

It is evident that kainit was the most profitable fertilizer on this soil in 1913. Similar results were obtained in 1912. However, under more severe attacks of boll weevil which are sure to come within the next few years, it is probable that phosphate and nitrogen will become increasingly important as means of hastening growth.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	88 lbs.
To acid phosphate plot.....	184 lbs.
To kainit plot.....	32 lbs.

Average increase with cotton seed meal..... **101 lbs.**

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	48 lbs.
To cotton seed meal plot.....	144 lbs.
To kainit plot.....	000 lbs.

Average increase with acid phosphate..... **69 lbs.**

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	212 lbs.
---------------------------	----------

To cotton seed meal plot.....	156 lbs.
To acid phosphate plot.....	164 lbs.
<i>Average increase with kainit</i>	177 lbs.

Experiments in Sumter and Lowndes Counties.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	GEIGER			LETOHATCHIE			
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Per cent open at first picking
1	Lbs. 200	Cotton seed meal	Lbs. 760	Lbs. 88	\$0.87	Lbs. 1040	Lbs. 188	\$ 5.27	52
2	240	Acid phosphate	720	48	0.43	544	308	15.23	64
3	000	No fertilizer	672			852			54
4	200	Kainit	896	212	7.93	1344	492	20.25	46
5	200	C. S. Meal	928	232	5.53	848	—4	—4.86	58
	240	Acid phosphate							
6	200	C. S. Meal	952	244	6.34	1544	692	26.05	55
	200	Kainit							
7	000	No fertilizer	720						51
8	240	Acid phosphate	936	212	6.25	1232	380	13.64	70
	200	Kainit							
9	200	C. S. Meal	976	248	4.83	1368	516	16.62	59
	240	Acid phosphate							
	200	Kainit							
10	240	Acid phosphate	856	124	0.08	824			65
	100	Kainit							
11	000	No fertilizer	736						62
12	240	Acid phosphate	792	56	2.92				53
	100	Kainit							
	100	Nitrate of soda							

LOWNDES COUNTY, ½ MILE WEST OF
LETOHATCHIE.

J. B. MITCHELL, JR.

Black slough prairie land.

This experiment occupies a narrow bottom naturally fertile, and is typical of the bottom lands of the prairie region. On account of the narrowness of the bottom it was necessary to arrange the twelve plots in two series. Certain plots were found to be different in fertility from the others and this made it, in connection with

the location of each plot, advisable to use in calculating the increase the yield on only Plot 3 of unfertilized plots.

The largest profit, \$26.05 per acre, was obtained from Plot 6, fertilized with 200 pounds cotton seed meal and 200 pounds kainit per acre; this was equivalent to a profit of 592 per cent on the investment in fertilizer.

Alone, and in every combination, 200 pounds of kainit was extremely effective and profitable. This was probably due to the fact that rust did some damage, being reported as most severe on the plots receiving no kainit. Cotton seed meal was also effective and profitable in every combination, but to a less extent than an equal weight of kainit.

Acid phosphate was not only useless, but the yield on plots receiving this fertilizer was reduced, apparently by its presence. This is an exceptional result, even on prairie land, and is probably due to the hastening effect of acid phosphate, which brought the plants fertilized with phosphate into a condition where they were more severely injured than were the later plants by the drought in August and by rust.

The table on page 154 shows the percentage of the total yields of seed cotton harvested in the first of the three pickings on September 24. Note at this date Plot 2, receiving only acid phosphate, had 64 per cent of its crop open, while the kainit plot (4) had only 46 per cent of its bolls open.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	188 lbs.
To acid phosphate plot.....	266 lbs.
To kainit plot.....	62 lbs.
To acid phosphate and kainit plot.....	344 lbs.
<i>Average increase with cotton seed meal.....</i>	215 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	—308 lbs.
To cotton seed meal plot.....	—230 lbs.
To kainit plot.....	—111 lbs.
To cotton seed meal and kainit plot.....	171 lbs.
<i>Average increase with acid phosphate.....</i>	—120 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	423 lbs.
To cotton seed meal plot.....	297 lbs.
To acid phosphate plot.....	620 lbs.

To cotton seed meal and acid phosphate plot.....	698 lbs.
<i>Average increase with kainit</i>	510 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	698 lbs.
From use of 100 pounds kainit	362 lbs.

MARENGO COUNTY, 1 MILE EAST OF DEMOPOLIS.

J. P. & N. W. BOGESS.

Yellowish post oak clay.

This land has been long in cultivation. The original forest trees were oak. The preceding crop was cotton. The data here given is for the first two pickings only. The season was extremely dry. Boll weevils arrived too late to do much damage.

The largest profit, \$8.70 per acre, or 162 per cent on the investment in fertilizers, was made on Plot 12, which received a complete fertilizer containing nitrate of soda. This plot also made the largest increase in yield, 320 pounds of seed cotton per acre.

Each fertilizer, when applied singly or in complete fertilizer containing 200 pounds of kainit, made profitable yields.

Wherever kainit was applied with only phosphate or only meal, a decreased yield was obtained. However, on Plot 9, an increase of 140 pounds of seed cotton per acre was obtained by an application of 200 pounds of kainit, while there was no increase where only 100 pounds of kainit was used.

One hundred pounds of nitrate of soda, applied when the plants were small, was better by 270 pounds of seed cotton per acre than was 200 pounds of cotton seed meal applied before planting.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	160 lbs.
To acid phosphate plot	-120 lbs.
To kainit plot.....	-80 lbs.
To acid phosphate and kainit plot	150 lbs.
<i>Average increase with cotton seed meal</i>	28 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	200 lbs.
To cotton seed meal plot.....	-80 lbs.
To kainit plot.....	-50 lbs.

To cotton seed meal and kainit plot.....	180 lbs.
<i>Average increase with acid phosphate</i>	63 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	120 lbs.
To cotton seed meal plot.....	—120 lbs.
To acid phosphate plot.....	—130 lbs.
To cotton seed meal and acid phosphate plot.....	140 lbs.
<i>Average increase with kainit</i>	3 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	140 lbs.
From use of 100 pounds kainit.....	—30 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	150 lbs.
Increase from use of nitrate of soda.....	420 lbs.
Nitrate of soda better than cotton seed meal by.....	270 lbs.

Experiments in Marengo County.

			DEMOPOLIS			LINDEN		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cot-	Increase over	Profit from fertilizer	Yield seed cot-	Increase over	Profit from fertilizer
			ton per acre	unfertilized plot		ton per acre	unfertilized plot	
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal.....	1400	160	4.04	928	184	5.10
2	240	Acid phosphate.....	1440	200	7.12	1168	424	16.98
3	000	No fertilizer.....	1240			744		
4	200	Kainit.....	1360	120	3.88	824	88	2.47
5	200	C. S. Meal.....	1320	80	—1.16	1168	440	14.68
	240	Acid phosphate.....						
6	200	C. S. Meal.....	1280	40	—2.64	720	000	—4.40
	200	Kainit.....						
7	000	No fertilizer.....	1240			712		
8	240	Acid phosphate.....	1280	70	0.00	976	258	8.27
	200	Kainit.....						
9	200	C. S. Meal.....	1400	220	3.60	1160	436	13.10
	240	Acid phosphate.....						
10	200	Kainit.....	1200	50	—3.18	1200	470	15.30
	240	Acid phosphate.....						
11	000	No fertilizer.....	1120			736		
12	240	Acid phosphate.....	1440	320	8.70	1032	296	7.64
	100	Kainit.....						
	100	Nitrate of soda.....						

MARENGO COUNTY, 2 MILES SOUTHWEST OF
LINDEN.

J. T. SCOGIN.

Black, stiff post oak soil, with stiff, yellowish subsoil.

This field has been in cultivation for three years, since growing broomsedge and pine saplings. Boll weevil did some damage, especially on plots receiving nitrogen.

The largest increase, 470 pounds of seed cotton per acre, was afforded by the complete fertilizer on Plot 10. But the largest profit, \$16.98 per acre, or 1011 per cent on the investment in fertilizer, resulted from the use of acid phosphate alone (Plot 2).

Acid phosphate was by far the most important fertilizer constituent; nitrogen was also needed; but potash was useless.

The average increase was, with acid phosphate, 322 pounds of seed cotton per acre; with cotton seed meal, 73 pounds; and with kainit there was an average loss of 67 pounds per acre. However, 100 pounds of kainit afforded a small increase, but too slight to be notably profitable.

Cotton seed meal (200 pounds per acre, applied at date of planting, May 2) was much more effective than 100 pounds of nitrate of soda, applied July 10. This is probably explained by the late date on which the nitrate was applied, with consequent effect in delaying the maturity of the cotton plant and thus giving opportunity for greater damage by boll weevil and by early frost, October 21.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	184 lbs.
To acid phosphate plot.....	16 lbs.
To kainit plot.....	—88 lbs.
To acid phosphate and kainit plot.....	178 lbs.
<i>Average increase with cotton seed meal.....</i>	73 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	424 lbs.
To cotton seed meal meal plot.....	256 lbs.
To kainit plot.....	170 lbs.
To cotton seed meal and kainit plot.....	436 lbs.
<i>Average increase with acid phosphate.....</i>	322 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	88 lbs.
To cotton seed meal plot.....	—184 lbs.

To acid phosphate plot.....	166 lbs.
To cotton seed meal and acid phosphate plot.....	—4 lbs.
<i>Average increase with kainit</i>	—67 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit	—4 lbs.
From use of 100 pounds kainit	30 lbs.
Increase from use of cotton seed meal in complete fertilizer	178 lbs.
Increase from use of nitrate of soda.....	4 lbs.
Cotton seed meal better than nitrate of soda by.....	174 lbs.

SUMTER COUNTY, 1½ MILES SOUTH OF GEIGER.

E. A. GILBERT.

Light colored, stiff, branch bottom, with red clay subsoil.

This is not a lime soil though close to the southern edge of the prairie region. The field has been long in cultivation. The variety of cotton was Broadwell and the stand was good. Planting was not done until May 20, which late date of planting in this year of early frost may explain the low yields, especially on the unfertilized plots.

Kainit was by far the most important fertilizer constituent on this land, which is quite liable to cotton rust. Boll weevils did no perceptible damage. The average increase in pounds of seed cotton per acre was 475 pounds from kainit; 75 pounds from acid phosphate; and 67 pounds from cotton seed meal.

The largest profit, \$19.62 per acre, or 637 per cent on the investment in fertilizer, was obtained from the mixture of acid phosphate and kainit; the next largest profit, \$16.45 per acre, resulted from the use, on Plot 9, of a complete fertilizer containing 200 pounds of kainit.

Mr. Gilbert's experiment has been conducted for three years in succession on the same land. The results agree closely. In all three years kainit ranked first in effectiveness and profit, but phosphate and nitrogen were also needed. In all years 200 pounds of kainit per acre was more profitable than was 100 pounds per acre.

AVERAGE INCREASE DUE TO COTTON SEED MEAL, ACID PHOSPHATE OR KAINIT IN ALL COMBINATIONS.

Fertilizer—	1911	1912	1913	Av. 3 yrs.
200 lbs. cotton seed meal	133	72	67	91
240 lbs. acid phosphate	156	132	75	121
200 lbs. kainit	276	440	435	316
200 lbs. cotton seed meal better than 100 lbs. nitrate of soda by	47	-80	-132	-55

It is clear from the above that when boll weevil injury is not severe the best fertilizer for cotton on this soil is one rich in potash but containing also acid phosphate and some form of nitrogen. Other experiments indicate that most soils need less potash or kainit than did Mr. Gilbert's soil. Moreover, when weevil infestation is severe the use of moderate amounts of kainit (say 100 pounds) is probably safer than the use of larger amounts, because kainit retards maturity.

Nitrate of soda was more profitable than cotton seed meal in two out of the three years.

Increase of seed cotton per acre when cotton seed meal was added:	1913
To unfertilized plot	8 lbs.,
To acid phosphate plot	128 lbs.
To kainit plot	136 lbs.
To acid phosphate and kainit plot	—4 lbs
<i>Average increase with cotton seed meal</i>	67 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	—80 lbs.
To cotton seed meal plot	40 lbs.
To kainit plot	240 lbs.
To cotton seed meal and kainit plot	100 lbs.
<i>Average increase with acid phosphate</i>	75 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	276 lbs.
To cotton seed meal plot	404 lbs.
To acid phosphate plot	596 lbs.
To cotton seed meal and acid phosphate plot	464 lbs.
<i>Average increase with kainit</i>	435 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit	464 lbs.
From use of 100 pounds kainit	292 lbs.
Increase from use of cotton seed meal in complete fertilizer	—4 lbs.
Increase from use of nitrate of soda	128 lbs.
Nitrate of soda better than cotton seed meal by	132 lbs.

Experiments in Sumter and Hale Counties.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	GEIGER			GREENSBORO		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	216	8	\$-2.65	1008	128	\$ 2.63
2	240	Acid phosphate	128	-80	-5.20	848	-32	-3.09
3	000	No fertilizer	208			880		
4	200	Kainit	504	276	10.74	1008	112	3.53
5	200	C. S. Meal	296	48	-2.57	1008	196	3.94
	240	Acid phosphate						
6	200	C. S. Meal	680	412	13.73	1120	292	8.45
	200	Kainit						
7	000	No fertilizer	288			944		
8	240	Acid phosphate	800	516	19.62	1040	96	1.14
	200	Kainit						
9	200	C. S. Meal	792	512	16.45	1088	144	0.26
	240	Acid phosphate						
	200	Kainit						
10	200	C. S. Meal	616	340	9.58	1072	128	0.25
	240	Acid phosphate						
11	100	Kainit	272			944		
12	000	No fertilizer	744	472	15.39	1264	320	8.70
	240	Acid phosphate						
	100	Nitrate of soda						

HALE COUNTY, 1½ MILES SOUTHEAST OF
GREENSBORO.

P. A. TUTWILER, JR.

Gray, sandy soil, with red clay subsoil.

The recent crops on this old land were cotton. No damage was done by rust nor by boll weevil. The largest increase, 320 pounds of seed cotton per acre, was afforded by Plot 12, which received a complete fertilizer, containing nitrate of soda.

The largest profit, \$8.70 per acre, or 161 per cent on the investment in fertilizers, was also obtained on Plot 12. The second largest profit, \$8.45 per acre, or 192 per cent on the investment in fertilizer, was obtained on Plot 6, fertilized with cotton seed meal and kainit.

The average increase attributable to cotton seed meal in all

combinations was 96 pounds of seed cotton per acre; to acid phosphate, an average loss of 32 pounds of seed cotton per acre; and, to kainit, an increase of 88 pounds of seed cotton per acre.

One hundred pounds of kainit was practically as good as 200 pounds in 1913 and better than 200 pounds in 1912. Nitrate of soda was considerably more effective than cotton seed meal both in 1912 and in 1913. In 1912, nitrogen was by far the most important fertilizer constituent, but potash was also profitable and phosphate of doubtful profit.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	128 lbs.
To acid phosphate plot.....	128 lbs.
To kainit plot.....	80 lbs.
To acid phosphate and kainit plot.....	48 lbs.
<i>Average increase with cotton seed meal.....</i>	<u>96 lbs.</u>

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	—32 lbs.
To cotton seed meal plot.....	—32 lbs.
To kainit plot.....	—16 lbs.
To cotton seed meal and kainit plot.....	—48 lbs.
<i>Average increase with acid phosphate.....</i>	<u>—32 lbs.</u>

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	112 lbs.
To cotton seed meal plot.....	64 lbs.
To acid phosphate plot.....	128 lbs.
To cotton seed meal and acid phosphate plot.....	48 lbs.
<i>Average increase with kainit.....</i>	<u>88 lbs.</u>

Increase of seed cotton per acre from use of different quantities of kainit:

From use of 200 pounds kainit.....	48 lbs.
From use of 100 pounds kainit.....	32 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	48 lbs.
Increase from the use of nitrate of soda.....	240 lbs.
Nitrate of soda better than cotton seed meal by.....	192 lbs.

CHOCTAW COUNTY, $\frac{1}{4}$ MILE EAST OF LISMAN.

B. J. EZELL.

Gray, sandy loam, with yellow subsoil.

This poor, sandy land had been long in cultivation. The three preceding crops were cotton, which probably explains the large amount of damage by the boll weevil.

The injury by boll weevil probably explains in part why all the crop was picked out by October 7, and why there are apparent contradictions among the figures representing the increase.

The largest increase, 256 pounds of seed cotton per acre, was afforded by Plot 10, receiving a complete fertilizer containing 100 pounds of kainit per acre.

Kainit was the fertilizer most needed under the peculiar conditions of this year of drought. One hundred pounds was more effective than 200 pounds. It should be noted that the seasons were such that kainit did not greatly delay maturity (at least not beyond October 7).

Cotton seed meal and nitrate of soda were both profitable, but phosphate was apparently injurious. The writers believe that this latter result is exceptional and attributable to the peculiar character of the seasons; for it sometimes happens that on a soil needing phosphate this fertilizer so hastens maturity as to make the plant enter a period of drought in a condition in which it is especially liable to injury by rust, shedding, etc.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	144 lbs.
To acid phosphate plot.....	—136 lbs.
To kainit plot.....	24 lbs.
To acid phosphate and kainit plot.....	112 lbs.
<i>Average increase with cotton seed meal.....</i>	<u>36 lbs.</u>

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	80 lbs.
To cotton seed meal plot.....	—200 lbs.
To kainit plot.....	—148 lbs.
To cotton seed meal and kainit plot.....	—60 lbs.
<i>Average increase with acid phosphate.....</i>	<u>—82 lbs.</u>

Increase of seed cotton per acre when acid phosphate was added.

To unfertilized plot.....	212 lbs.
To cotton seed meal plot.....	92 lbs.

To acid phosphate plot	—16 lbs.
To cotton seed meal and acid phosphate plot	232 lbs.
<i>Average increase with kainit</i>	130 lbs.
Increase of seed cotton per acre from use of different quantities of kainit.	
From use of 200 pounds kainit	232 lbs.
From use of 100 pounds kainit	312 lbs.
Increase from use of cotton seed meal in complete fertilizer	112 lbs.
Increase from use of nitrate of soda	96 lbs.
Cotton seed meal better than nitrate of soda by	16 lbs.

Experiments in Choctaw County,

			LISMAN (¼ m. East)			LISMAN (6 m. S. E.)		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
			Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal ..	464	144	\$ 3.34	320	000	\$-3.00
2	240	Acid phosphate	400	80	1.84	360	40	0.08
3	000	No fertilizer	320			320		
4	200	Kainit	560	212	7.93	440	114	3.62
5	200	C. S. Meal	320	—56	—7.14	472	140	1.48
	240	Acid phosphate ..						
6	200	C. S. Meal	660	236	5.98	560	222	5.37
	200	Kainit						
7	000	No fertilizer	432			344		
8	240	Acid phosphate ..	512	64	—0.26	608	258	8.27
	200	Kainit						
9	200	C. S. Meal	640	176	1.66	664	308	7.47
	240	Acid phosphate ..						
10	200	Kainit	736	256	5.88	784	422	13.19
	100	C. S. Meal						
11	000	No fertilizer	496			368		
12	240	Acid phosphate ..	736	240	5.18	624	256	5.88
	100	Kainit						
	100	Nitrate of soda ..						

CHOCTAW COUNTY, 6 MILES SOUTHEAST OF LISMAN.

J. L. COVINGTON.

Light colored sandy loam, with stiffer subsoil.

This land had been cleared for many years. The two preceding crops were cotton. About August 5, Mr. Covington reported that weevils were numerous and that he was picking up squares, but that the crop was then looking promising.

The largest profit, \$13.19 per acre, or 245 per cent on the investment in fertilizer, was obtained on Plot 10, which received a complete fertilizer containing only 100 pounds of kainit. This smaller amount of kainit was more effective and profitable than a larger amount, though both paid well.

The average increase attributable to kainit was 183 pounds of seed cotton per acre; to acid phosphate, 103 pounds; and, to cotton seed meal, 65 pounds.

Nitrate of soda, applied July 20, not only failed to increase the yields, but apparently depressed the yield. This is probably due to the extremely late date of application, a date too late for best results in the absence of the weevil, and much too late when the boll weevil is present.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	000 lbs.
To acid phosphate plot.....	100 lbs.
To kainit plot.....	108 lbs.
To acid phosphate and kainit plot.....	50 lbs.
<i>Average increase with cotton seed meal.....</i>	65 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	40 lbs.
To cotton seed meal plot.....	140 lbs.
To kainit plot.....	144 lbs.
To cotton seed meal and kainit plot.....	86 lbs.
<i>Average increase with acid phosphate.....</i>	103 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	114 lbs.
To cotton seed meal plot.....	222 lbs.
To acid phosphate plot.....	218 lbs.
To cotton seed meal and acid phosphate plot.....	168 lbs.
<i>Average increase with kainit.....</i>	183 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds of kainit.....	168 lbs.
From use of 100 pounds kainit.....	282 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	50 lbs.
Increase from use of nitrate of soda.....	116 lbs.
Cotton seed meal better than nitrate of soda by.....	166 lbs.

CLARKE COUNTY, 6 MILES WEST OF THOMASVILLE.

R. L. HEARRON.

Gray, sandy loam with stiffer subsoil.

This land had been in cultivation for many years. The two preceding crops were cotton. Hot weather in August did some damage, and boll weevils were present late in the season.

The largest increase, 416 pounds of seed cotton per acre, was obtained on Plot 12, receiving a complete fertilizer including nitrate of soda. This plot also afforded the largest net profit, \$12.92 per acre, or 240 per cent on the investment in fertilizer.

The average increase attributable to cotton seed meal was 223 pounds of seed cotton per acre; to acid phosphate only 14 pounds; while with kainit there was an average loss of 13 pounds of seed cotton when we average results of applying 200 pounds of kainit per acre in four different combinations.

Nitrate of soda applied June 10, at the rate of 100 pounds per acre, was more effective than was 200 pounds of cotton seed meal applied before planting.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	200 lbs.
To acid phosphate plot.....	124 lbs.
To kainit plot.....	292 lbs.
To acid phosphate and kainit plot.....	276 lbs.

Average increase with cotton seed meal..... **223 lbs.**

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	96 lbs.
To cotton seed meal plot.....	20 lbs.
To kainit plot.....	-22 lbs.
To cotton seed meal and kainit plot.....	-38 lbs.

Average increase with acid phosphate..... **14 lbs.**

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	-14 lbs.
To cotton seed meal plot.....	72 lbs.
To acid phosphate plot.....	-132 lbs.
To cotton seed meal and acid phosphate plot.....	20 lbs.

Average increase with kainit..... **-12 lbs.**

Increase of seed cotton per acre from use of different quantities of kainit:

From use of 200 pounds kainit.....	20 lbs.
From use of 100 pounds kainit.....	32 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	276 lbs.
Increase from use of nitrate of soda.....	440 lbs.
Nitrate of soda better than cotton seed meal by.....	164 lbs.

Experiments in Clarke and Washington Counties.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	THOMASVILLE			LEROY		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	712	200	5 80	576	96	1 22
2	240	Acid phosphate	608	96	2 54	608	128	3 95
3	000	No fertilizer	512			480		
4	200	Kainit	544	-14	-2 02	592	116	3 70
5	200	C. S. Meal	824	220	5 01	832	360	11 16
	240	Acid phosphate						
6	200	C. S. Meal	928	278	7 83	768	300	8 80
	200	Kainit						
7	000	No fertilizer	696			464		
8	240	Acid phosphate	600	-36	-4 66	624	152	3 61
	200	Kainit						
9	200	C. S. Meal	816	240	4 48	688	208	3 07
	240	Acid phosphate						
10	200	Kainit	768	252	5 71	656	168	2 01
	240	Acid phosphate						
11	100	Kainit	456			496		
	000	No fertilizer						
12	240	Acid phosphate	872	416	12 92	576	80	-1 86
	100	Kainit						
	100	Nitrate of soda						

WASHINGTON COUNTY, 7 MILES WEST OF
CARSON, NEAR LEROY.

A. D. PRUITT.

Red sandy loam, with reddish clay subsoil.

The largest increase, 360 pounds of seed cotton per acre, and the largest profit, \$11.16 per acre, or 238 per cent on the investment in fertilizers, was afforded by Plot 5. This was fertilized at the rate per acre of

- 200 pounds of cotton seed meal,
- 240 pounds of acid phosphate.

Boll weevils did much damage and it is doubtless due to this fact that the complete fertilizers on Plots 9 and 10, and especially on Plot 12, afforded only slight profits. Possibly the kainit in these complete fertilizers induced additional boll weevil injury by

delaying maturity. Likewise it is quite probable that the unnaturally low yield on Plot 12, may have been due to the late application of nitrate of soda, which in many of our tests has served to notably retard the maturity of the cotton plant. Where nitrate of soda is used as a fertilizer for cotton in the presence of the boll weevil it should be applied earlier than is usually done, probably soon after vigorous growth begins not long after the cotton is first "dirted", or when about 6 or 8 inches high.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	96 lbs.
To acid phosphate plot.....	232 lbs.
To kainit plot.....	184 lbs.
To acid phosphate and kainit plot.....	56 lbs.
<i>Average increase with cotton seed meal.....</i>	142 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	128 lbs.
To cotton seed meal plot.....	264 lbs.
To kainit plot.....	36 lbs.
To cotton seed meal and kainit plot.....	-92 lbs.
<i>Average increase with acid phosphate.....</i>	84 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	116 lbs.
To cotton seed meal plot.....	204 lbs.
To acid phosphate plot.....	24 lbs.
To cotton seed meal and acid phosphate plot.....	-152 lbs.
<i>Average increase with kainit.....</i>	48 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	56 lbs.
Increase from use of nitrate of soda.....	-32 lbs.
Cotton seed meal better than nitrate of soda by.....	88 lbs.

CLARKE COUNTY, 8 MILES WEST OF WHATLEY, NEAR GROVE HILL.

J. WINTERS CALHOUN.

Gray, sandy soil, with red clay subsoil.

This land had been cleared about ten years, and the preceding crop was cotton. The stand was good. Boll weevils were present, but did little damage.

The average increase due to acid phosphate was 136 pounds of seed cotton per acre; to cotton seed meal, 118 pounds; and,

with kainit, there was a loss of 4 pounds of seed cotton per acre when all kainit combinations are averaged, but a moderate increase wherever kainit was used in a complete fertilizer.

The largest profit per acre, \$9.05, or 168 per cent on the investment in fertilizers, was obtained on Plot 10. This mixture, which seems to be one that may well be recommended for similar lands, consists of—

200 pounds cotton seed meal.
240 pounds acid phosphate.
100 pounds kainit.

The preceding year, on fresher land, the average increase with acid phosphate was 213 pounds of seed cotton per acre; with cotton seed meal, 129 pounds; and, with kainit, 104 pounds.

In both years the smaller amount of kainit gave a larger yield than 200 pounds.

Cotton seed meal was better than nitrate of soda.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	256 lbs
To acid phosphate plot.....	24 lbs
To kainit plot.....	136 lbs.
To acid phosphate and kainit plot.....	56 lbs.
<i>Average increase with cotton seed meal.....</i>	118 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	208 lbs.
To cotton seed meal plot.....	—24 lbs.
To kainit plot.....	220 lbs.
To cotton seed meal and kainit plot.....	140 lbs.
<i>Average increase with acid phosphate.....</i>	136 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	12 lbs.
To cotton seed meal plot.....	—108 lbs.
To acid phosphate plot.....	24 lbs.
To cotton seed meal and acid phosphate plot.....	56 lbs.
<i>Average increase with kainit.....</i>	—4 lbs.

Increase of seed cotton per acre from use of different quantities of kainit:

From use of 200 pounds kainit.....	56 lbs.
From use of 100 pounds kainit.....	96 lbs.
Increase from use of cotton seed meal.....	56 lbs.
Increase from use of nitrate of soda.....	—48 lbs.
Nitrate of soda better than cotton seed meal by.....	8 lbs.

Experiments in Clarke and Monroe Counties.

			GROVE HILL			MONROEVILLE		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	832	256	8.26	872	128	2.63
2	240	Acid phosphate	784	208	7.47	800	56	0.78
3	000	No fertilizer	576			744		
4	200	Kainit	592	12	-0.87	712	-70	-4.48
5	200	C. S. Meal	816	232	5.53	1040	220	5.00
	240	Acid phosphate						
6	200	C. S. Meal	736	148	2.11	1088	230	5.72
	200	Kainit						
7	000	No fertilizer	592			896		
8	240	Acid phosphate	848	232	7.13	904	52	-0.79
	200	Kainit						
9	200	C. S. Meal	928	288	6.59	896	88	-2.21
	240	Acid phosphate						
10	200	C. S. Meal	992	328	9.05	912	148	1.13
	100	Kainit						
11	000	No fertilizer	688			720		
12	240	Acid phosphate	912	224	4.48	968	248	5.53
	100	Kainit						
	100	Nitrate of soda						

MONROE COUNTY, 3 MILES SOUTHEAST OF
MONROEVILLE.

J. L. HOLLOWAY.

Gray, sandy loam, with reddish subsoil.

Boll weevils did some damage and so did drought.

One hundred pounds of nitrate of soda applied at the early date of June 7, was much more profitable than 200 pounds of cotton seed meal before planting, in spite of the fact that the weather was almost continuously dry from June 8, to about the middle of July.

The largest profit, \$5.72, per acre, or 130 per cent on the investment in fertilizer, was obtained from Plot 6, which received a mixture of 200 pounds of each cotton seed meal and kainit.

The next largest profit, \$5.53, or 103 per cent on the invest-

ment in fertilizer, was obtained on Plot 12, where a complete fertilizer containing nitrate of soda was used.

Phosphoric acid was helpful in some combinations, but most of the plots receiving it showed reduced yields.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	128 lbs.
To acid phosphate plot.....	164 lbs.
To kainit plot.....	300 lbs.
To acid phosphate and kainit plot.....	36 lbs.

Average increase with cotton seed meal..... 157 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	56 lbs.
To cotton seed meal plot.....	92 lbs.
To kainit plot.....	122 lbs.
To cotton seed meal and kainit plot.....	—142 lbs.

Average increase with acid phosphate..... 32 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	—70 lbs.
To cotton seed meal plot.....	102 lbs.
To acid phosphate plot.....	—4 lbs.
To cotton seed meal and acid phosphate plot.....	—132 lbs.

Average increase with kainit..... —26 lbs.

Increase from use of cotton seed meal in complete fertilizer..... 36 lbs.

Increase from use of nitrate of soda..... 136 lbs.

Nitrate of soda better than cotton seed meal by..... 100 lbs.

WILCOX COUNTY, $\frac{3}{4}$ MILE NORTHWEST OF MCWILLIAMS.

R. F. CHAPPELL.

Gray, sandy soil, with yellowish subsoil.

The preceding crop was oats. The field had been many years in cultivation.

The largest profit, \$11.87, per acre, or 221 per cent on the investment in fertilizers, was obtained on Plot 12, which received a complete fertilizer containing 100 pounds of nitrate of soda.

The average increase, due to kainit, was 219 pounds of seed cotton per acre; to cotton seed meal, 141 pounds; and, to acid phosphate, only 35 pounds.

Evidently kainit was by far the most important constituent, but nitrogen was also needed. This year acid phosphate was not

profitable on this soil. However, on soils like this, it is probably advisable to include acid phosphate when the boll weevil is present, because of the tendency of acid phosphate to hasten maturity.

In the presence of the boll weevil it may also be advisable here to reduce the amount of kainit below 200 pounds, though the latter amount, in a season when boll weevil did no damage, afforded a better yield and more profit than did 100 pounds of kainit per acre.

Nitrate of soda, applied June 9, was much more effective than cotton seed meal containing the same quantity of nitrogen and applied before planting was done.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	104 lbs.
To acid phosphate plot.....	120 lbs.
To kainit plot.....	216 lbs.
To acid phosphate and kainit plot.....	124 lbs.
<i>Average increase with cotton seed meal</i>	141 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	16 lbs.
To cotton seed meal plot.....	32 lbs.
To kainit plot.....	92 lbs.
To cotton seed meal and kainit plot.....	00 lbs.
<i>Average increase with acid phosphate</i>	35 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	152 lbs.
To cotton seed meal plot.....	264 lbs.
To acid phosphate plot.....	228 lbs.
To cotton seed meal and acid phosphate plot.....	232 lbs.
<i>Average increase with kainit</i>	219 lbs.

Increase of seed cotton per acre from use of different quantities of kainit:

From use of 200 pounds kainit.....	232 lbs.
From use of 100 pounds kainit.....	132 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	124 lbs.
Increase from use of nitrate of soda.....	248 lbs.
Nitrate of soda better than cotton seed meal by.....	124 lbs.

Experiments in Wilcox and Butler Counties.

			McWILLIAMS			GREENVILLE		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.		Lbs.	Lbs.	
1	200	Cotton seed meal	560	104	\$ 1.58	928	448	\$16.71
2	240	Acid phosphate	472	16	-0.98	808	328	12.75
3	000	No fertilizer	456			480		
4	200	Kainit	616	152	5.29	552	66	1.50
5	200	C. S. Meal	608	136	1.30	960	468	15.91
	240	Acid phosphate						
6	200	C. S. Meal	848	368	11.79	672	174	3.26
	200	Kainit						
7	000	No fertilizer	488			504		
8	240	Acid phosphate	752	244	7.66	720	212	6.25
	200	Kainit						
9	200	C. S. Meal	896	368	10.11	752	240	4.48
	240	Acid phosphate						
	200	Kainit						
10	200	C. S. Meal	816	268	6.41	840	324	8.88
	240	Acid phosphate						
	100	Kainit						
11	000	No fertilizer	568			520		
12	240	Acid phosphate	960	392	11.87	832	312	8.35
	100	Kainit						
	100	Nitrate of soda						

BUTLER COUNTY, 7 MILES NORTHEAST OF
GREENVILLE.

E. L. GRAYDON.

Gray, sandy loam, with stiffer subsoil.

This land had been in cultivation about 80 years. The preceding crop was corn.

The largest increase, 468 pounds per acre, was afforded by Plot 5, fertilized with cotton seed meal and acid phosphate. The profit on this plot was \$15.91 per acre, or 300 per cent on the investment in fertilizer, which is a better return than those afforded by the plots receiving complete fertilizers. It is believed that Plot 1, and probably Plot 2, were somewhat richer than were the other plots.

Apparently both nitrogen and phosphate were needed on this soil, but potash was unprofitable.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	448 lbs.
To acid phosphate plot.....	140 lbs.
To kainit plot.....	108 lbs.
To acid phosphate and kainit plot.....	28 lbs.
<i>Average increase with cotton seed meal</i>	181 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	328 lbs.
To cotton seed meal plot.....	20 lbs.
To kainit plot.....	146 lbs.
To cotton seed meal and kainit plot.....	66 lbs.
<i>Average increase with acid phosphate</i>	140 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	66 lbs.
To cotton seed meal plot.....	—274 lbs.
To acid phosphate plot.....	—116 lbs.
To cotton seed meal and acid phosphate plot.....	—228 lbs.
<i>Average increase with kainit</i>	—138 lbs.

Increase from use of cotton seed meal in complete fertilizer.....	28 lbs.
Increase from use of nitrate of soda.....	16 lbs.
<i>Cotton seed meal better by</i>	12 lbs.
Cotton seed meal better than nitrate of soda by.....	12 lbs.

ESCAMBIA COUNTY, 4 MILES NORTHEAST OF ATMORE.

I. JORDAN.

Reddish, sandy loam, with stiffer red subsoil.

The field had been in cultivation about 20 years. The preceding crop was oats. Weevils did no damage.

The largest increase, 376 pounds of seed cotton per acre, was obtained from the use of a complete fertilizer on Plot 9.

The largest profit, however, \$11.35 per acre, or 369 per cent on the investment in fertilizer, was afforded by Plot 8. The second largest profit, \$10.81, or 201 per cent on the investment in fertilizer, was given by Plot 12, fertilized with a complete fertilizer containing nitrate of soda.

The average increase due to kainit in all combinations was 270 pounds of seed cotton per acre; to acid phosphate, 46 pounds of

seed cotton per acre; and, to cotton seed meal, 58 pounds of seed cotton per acre.

Two hundred pounds of kainit was much more effective than 100 pounds; this was true under conditions where the boll weevil did no damage. Studies of the effect of kainit in delaying maturity lead us to believe that in future, with the probability of more severe infestation, it would be advisable to reduce the amount of kainit to 100 pounds per acre and use it as a part of a complete fertilizer such as the one on Plot 10.

Nitrate of soda, applied June 1 (on cotton planted April 28), was more effective by 80 pounds of seed cotton per acre than was double its weight of cotton seed meal. Note the better results from early application of nitrate of soda in this experiment than from the late application in the experiment of Mr. Covington in Choctaw county, page 165.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	72 lbs.
To acid phosphate plot.....	80 lbs.
To kainit plot.....	32 lbs.
To acid phosphate and kainit plot.....	48 lbs.
<i>Average increase with cotton seed meal.....</i>	58 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	—48 lbs
To cotton seed meal plot.....	—40 lbs.
To kainit plot.....	128 lbs.
To cotton seed meal and kainit plot.....	144 lbs.
<i>Average increase with acid phosphate.....</i>	46 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	200 lbs.
To cotton seed meal plot.....	160 lbs
To acid phosphate plot.....	376 lbs.
To cotton seed meal and acid phosphate plot.....	344 lbs.
<i>Average increase with kainit.....</i>	270 lbs.

Increase of seed cotton per acre from use of different quantities of kainit:

To use of 200 pounds of kainit.....	344 lbs.
To use of 100 pounds kainit.....	256 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	48 lbs.
Increase from use of nitrate of soda.....	128 lbs.
Cotton seed meal better than nitrate of soda by.....	80 lbs.

Experiments in Escambia County.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	ATMORE			BREWTON		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
1	200	Cotton seed meal	Lbs. 552	Lbs. 72	\$ 0.17	Lbs. 744	Lbs. 200	\$ 5.80
2	240	Acid phosphate	342	—48	—3.79	792	248	9.23
3	000	No fertilizer	480	—	—	544	—	—
4	200	Kainit	720	200	7.40	624	68	1.59
5	200	C. S. Meal	592	32	—3.27	880	312	9.05
	240	Acid phosphate						
6	200	C. S. Meal	832	232	5.81	720	140	1.76
	200	Kainit						
7	000	No fertilizer	640	—	—	592	—	—
8	240	Acid phosphate	928	328	11.35	616	50	—0.88
	200	Kainit						
9	200	C. S. Meal	936	376	10.46	864	325	8.22
	240	Acid phosphate						
10	200	Kainit	808	288	7.29	800	287	7.25
	100	C. S. Meal						
11	000	No fertilizer	480	—	—	486	—	—
12	240	Acid phosphate	848	368	10.81	560	74	—2.12
	100	Kainit						
	100	Nitrate of soda						

ESCAMBIA COUNTY, 1 MILE SOUTH OF BREWTON.

SILAS MADDOX:

Gray, sanay loam, with stiffer yellowish subsoil.

The stand was good. Boll weevils were destructive; the damage amounting, in Mr. Maddox's opinion, to about one-third of the expected crop.

The largest increase; 325 pounds of seed cotton per acre, was obtained on Plot 9, with a complete fertilizer; and the second largest increase, 312 pounds, was on Plot 5, fertilized with only cotton seed meal and acid phosphate.

The largest profits were on Plot 5, \$9.05, a profit of 194 per cent on the investment in fertilizers, and \$9.23, or 550 per cent on the investment in fertilizer, on Plot 2, fertilized only with acid phosphate.

The average increase attributable to cotton seed meal was 143-

pounds of seed cotton per acre; to acid phosphate, 132 pounds per acre; and there was an average loss of 44 pounds of seed cotton per acre attributable to the use of 200 pounds of kainit in all its combinations.

Nitrate of soda appeared to make a notable reduction in the yield, probably because applied late it delayed maturity, and thus afforded most favorable conditions for injury by the weevil.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	200 lbs.
To phosphate plot.....	64 lbs.
To kainit plot.....	72 lbs.
To acid phosphate and kainit plot.....	275 lbs.
<i>Average increase with cotton seed meal</i>	153 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	248 lbs.
To cotton seed meal plot	112 lbs.
To kainit plot.....	—18 lbs.
To cotton seed meal and kainit plot	185 lbs.
<i>Average increase with acid phosphate</i>	132 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	68 lbs.
To cotton seed meal plot	—60 lbs.
To acid phosphate plot.....	—198 lbs.
To cotton seed meal and acid phosphate plot.....	13 lbs.
<i>Average increase with kainit</i>	—44 lbs.
Increase from use of cotton seed meal in complete fertilizer	275 lbs.
Increase from the use of nitrate of soda	62 lbs.
Cotton seed meal better than nitrate of soda by	213 lbs.

COVINGTON COUNTY, 1 MILE NORTHEAST OF ANDALUSIA.

W. N. RUSHTON

Grey sandy soil, with yellowish subsoil.

This field had been cleared about 12 years. The preceding crop was cotton, which had been preceded by corn crops.

The largest increase, 764 pounds of seed cotton per acre, was afforded by Plot 9, which received a complete fertilizer containing 200 pounds of kainit per acre. This plot also afforded the largest profit from the use of fertilizers, namely, \$27.54 per acre, which is 453 per cent on the investment in fertilizer.

All the plots receiving any kind of complete fertilizer afforded increases of more than 450 pounds of seed cotton per acre, and profits ranging between \$14.68 and \$27.54 per acre. The second largest profit, \$21.30, which was the highest percentage of profit on the investment in fertilizers, was obtained on Plot 4, which was fertilized with only 200 pounds of kainit per acre. A reduction of the amount of kainit to 100 pounds per acre reduced the yield considerably.

Kainit was by far the most important fertilizer constituent. The average increase attributable to 200 pounds of kainit was 510 pounds of seed cotton. Phosphate in most combinations was also profitable, especially in the complete fertilizer. The average increase in all combinations was 103 pounds attributable to acid phosphate. Nitrogen was also profitable. The average increase attributable to cotton seed meal was 90 pounds of seed cotton, but in the complete fertilizer 200 pounds of cotton seed meal seems to have produced an increase of 350 pounds of seed cotton.

Cotton seed meal at the rate of 200 pounds per acre was slightly more profitable than 100 pounds nitrate of soda applied June 15.

Boll weevils arrived too late to damage the crop. When they are present in destructive numbers, as they will probably be in future years, farmers should be cautious to apply no more kainit than is needed. Excessive amounts of kainit exert a retarding effect on the cotton plant and hence make it more liable to weevil injury.

Similarly a larger proportion of acid phosphate should be employed in fertilizer formulas on this soil when the boll weevil is present in numbers than is suggested by the results of some of these tests.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	120 lbs.
To acid phosphate plot.....	72 lbs.
To kainit plot.....	56 lbs.
To acid phosphate and kainit plot.....	350 lbs.
<i>Average increase with cotton seed meal.....</i>	<u>90 lbs.</u>

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	64 lbs.
To cotton seed meal plot.....	256 lbs.
To kainit plot.....	102 lbs.

To cotton seed meal and kainit plot..... 192 lbs.

Average increase with acid phosphate..... 103 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot..... 516 lbs.

To cotton seed meal plot..... 692 lbs.

To acid phosphate plot..... 350 lbs.

To cotton seed meal and acid phosphate plot..... 628 lbs.

Average increase with kainit..... 547 lbs.

Increase of seed cotton per acre from use of different quantities of kainit-

To use of 200 pounds kainit..... 628 lbs.

To use of 100 pounds kainit..... 362 lbs.

Increase from use of cotton seed meal in complete fertilizer..... 350 lbs.

Increase from use of nitrate of soda..... 308 lbs.

Cotton seed meal better than nitrate of soda by..... 42 lbs.

Experiments in Covington and Geneva Counties.

			ANDALUSIA			HARTFORD		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
1	Lbs. 200	Cotton seed meal	Lbs. 280	Lbs. -120	\$-8.28	Lbs. 392	Lbs. 24	\$-1.04
2	240	Acid phosphate	464	64	1.14	472	104	2.90
3	000	No fertilizer	400			368		
4	200	Kainit	952	516	21.30	568	176	6.34
5	200	C. S. Meal	608	136	1.30	768	352	10.81
	240	Acid phosphate						
6	200	C. S. Meal	1080	572	20.77	664	224	5.46
	200	Kainit						
7	000	No fertilizer	544			464		
8	240	Acid phosphate	976	414	15.14	832	376	13.46
	200	Kainit						
9	200	C. S. Meal	1344	764	27.54	860	412	12.05
	240	Acid phosphate						
10	200	Kainit	1096	498	16.53	720	280	6.94
	100	Kainit						
11	000	No fertilizer	616			432		
	240	Acid phosphate						
12	100	Kainit	1072	456	14.68	760	328	9.05
	100	Nitrate of soda						

GENEVA COUNTY, 3½ MILES WEST OF
HARTFORD.

G. E. GRANTHAM.

Gray sandy loam with yellowish clay subsoil.

This land has been cleared about 23 years. The original forest trees were oak and long leaf pine. The stand was good on all plots.

The largest increase in yield, 412 pounds of seed cotton per acre at a profit of \$12.50 per acre, or 198 per cent on the investment in fertilizer, was obtained on Plot 9, where an application of a complete fertilizer, containing cotton seed meal, acid phosphate, and 200 pounds of kainit was applied. The largest profit, \$13.46 per acre, or 437 per cent on the investment in fertilizer, was obtained on Plot 8, where acid phosphate and kainit were used.

The average increase of seed cotton per acre attributable to cotton seed meal was 89 pounds; to acid phosphate 205; and to kainit 177.

Nitrate of soda applied June 10, about five weeks after planting, gave an increase of 48 pounds of seed cotton per acre more than did cotton seed applied before planting.

In both 1912 and 1913, complete fertilizers were profitable on this soil; the largest increase in seed cotton per acre was obtained on Plot 9, from this combination. It will be noted that a slightly larger profit in 1913, was obtained from a combination of acid phosphate and kainit, but the writers believe that an application of a complete fertilizer in most years will prove advisable. An average of the results in 1912 and 1913 gives a profit greater by \$6.07 per acre for the complete fertilizers than with the mixture of acid phosphate and kainit. In both years 100 pounds of kainit per acre in a complete fertilizer did not afford a sufficient amount of potash.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	24 lbs.
To acid phosphate plot.....	248 lbs.
To kainit plot.....	48 lbs.
To acid phosphate and kainit plot.....	36 lbs.
<i>Average increase with cotton seed meal</i>	89 lbs.

Increase of seed cotton per acre when acid phosphate added:

To unfertilized plot.....	104 lbs.
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To cotton seed meal plot	328 lbs.
To kainit plot.....	200 lbs.
To cotton seed meal and kainit plot.....	188 lbs.
<i>Average increase with acid phosphate</i>	205 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	176 lbs.
To cotton seed meal plot	200 lbs.
To acid phosphate plot.....	272 lbs.
To cotton seed meal and acid phosphate plot.....	60 lbs.
<i>Average increase with kainit</i>	177 lbs

Increase of seed cotton per acre from use of different quantities of kainit:

To use of 200 pounds kainit	60 lbs.
To use of 100 pounds kainit	-72 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	36 lbs.
Increase from use of nitrate of soda.....	84 lbs.
Nitrate of soda better than cotton seed meal by.....	48 lbs.

PIKE COUNTY, 6 MILES SOUTH OF TROY.

N. T. GIBSON. •

Light colored sandy soil, with yellowish subsoil.

The stand was uniform. No damage was reported as being done by either disease or insects. This very poor upland had been long in cultivation and recent cropping has been cotton continuously.

The largest profit, \$12.58, or 286 per cent on the investment in fertilizer, was obtained on Plot 6, where a mixture of cotton seed meal and kainit was used. Profits of \$11.52 and \$10.81 per acre were obtained on Plots 9 and 10, respectively, where complete fertilizers were used.

The average increase due to cotton seed meal was 274 pounds of seed cotton per acre; to acid phosphate, 132 pounds per acre; and to kainit, 87 pounds per acre.

It is evident that the most important fertilizing element needed by this soil was nitrogen. Cotton seed meal when applied before planting at the rate of 200 pounds per acre was more effective than was nitrate of soda applied when the plants were from six to eight inches high.

Increase of seed cotton per acre when cotten seed meal was added:

To unfertilized plot.....	264 lbs.
To acid phosphate plot.....	284 lbs.
To kainit plot.....	228 lbs.

To acid phosphate and kainit plot.....	320 lbs.
<i>Average increase with cotton seed meal</i>	274 lbs
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	64 lbs.
To cotton seed meal plot.....	84 lbs.
To kainit plot.....	78 lbs.
To cotton seed meal and kainit plot.....	14 lbs.
<i>Average increase with acid phosphate</i>	24 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	158 lbs.
To cotton seed meal plot.....	122 lbs.
To acid phosphate plot.....	16 lbs.
To cotton seed meal and acid phosphate plot.....	52 lbs.
<i>Average increase with kainit</i>	87 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
To use of 200 pounds kainit.....	52 lbs.
To use of 100 pounds kainit.....	20 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	320 lbs.
Increase from use of nitrate of soda.....	192 lbs.
Cotton seed meal better than nitrate of soda by.....	128 lbs.

Experiments in Pike and Dale Counties.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	TROY			OZARK		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	488	264	8.62	132	68	-0.01
2	240	Acid phosphate	288	64	1.14	100	36	-0.10
3	000	No fertilizer	224			64		
4	200	Kainit	376	158	5.55	168	106	3.26
5	200	C. S. Meal	560	348	10.63	224	164	2.54
	240	Acid phosphate						
6	200	C. S. Meal	592	386	12.58	224	166	2.90
	200	Kainit						
7	000	No fertilizer	200			56		
8	240	Acid phosphate	280	80	0.44	272	219	6.56
	200	Kainit						
9	200	C. S. Meal	600	400	11.52	392	342	8.97
	240	Acid phosphate						
10	200	Kainit	568	368	10.81	208	161	1.70
	100	C. S. Meal						
11	000	No fertilizer	200			44		
12	240	Acid phosphate	440	240	5.18	316	272	6.59
	100	Kainit						
	100	Nitrate of soda						

DALE COUNTY, $\frac{1}{2}$ MILE SOUTH OF OZARK.

J. W. BYRD.

Gray sandy soil, with yellowish sandy subsoil.

This land has been cleared for many years. The preceding crop was cotton, which was preceded by peanuts. A complete fertilizer was needed.

The largest profit from fertilizers, \$8.97 or 147 per cent on the investment, was made on Plot 9, which received a complete fertilizer containing 200 pounds of kainit. The average increase attributable to 200 pounds of kainit in its various combinations was 141 pounds of seed cotton; to acid phosphate, 105 pounds; and to cotton seed meal, 95 pounds.

In the complete fertilizer kainit and phosphate were of about equal importance, and cotton seed meal almost equally effective.

Nitrate of soda applied at the rate of 100 pounds per acre June 30 (six weeks after planting), was decidedly more effective than 200 pounds of cotton seed meal applied before planting.

Two hundred pounds of kainit was more effective than 100 pounds.

This is the third year in succession that Mr. Byrd has made this experiment on the same character of soil. The following table shows increase attributable to cotton seed meal, acid phosphate and potash, each in four different combinations.

Fertilizer—	1911	1912	1913	Av. 3 yrs
200 lbs. cotton seed meal.....	222	280	95	199
240 lbs. acid phosphate.....	141	148	105	131
200 lbs. kainit.....	254	180	141	192
200 lbs. cotton seed meal better than 100 lbs. of nitrate of soda by.....	41	32	-111	-13

The results of the three years teach practically the same lessons, namely.

(1). A complete fertilizer is needed on this soil.

(2). In all three years in a complete fertilizer, 200 pounds of kainit has been slightly more profitable than 100 pounds. (This does not necessarily mean that the same result will obtain in the future in the presence of the boll weevil in destructive numbers.)

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	68 lbs.
To acid phosphate plot.....	128 lbs.
To kainit plot.....	60 lbs.
To acid phosphate and kainit plot.....	123 lbs.
<i>Average increase with cotton seed meal</i>	95 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	36 lbs.
To cotton seed meal plot.....	96 lbs.
To kainit plot.....	113 lbs.
To cotton seed meal and kainit plot.....	176 lbs.
<i>Average increase with acid phosphate</i>	105 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	106 lbs.
To cotton seed meal plot.....	98 lbs.
To acid phosphate plot.....	183 lbs.
To cotton seed meal and acid phosphate plot.....	178 lbs.
<i>Average increase with kainit</i>	141 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
To use of 200 pounds kainit.....	178 lbs.
To use of 100 pounds kainit.....	—3 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	
123 lbs.	
Increase from the use of nitrate of soda.....	
234 lbs.	
Nitrate of soda better than cotton seed meal by.....	
111 lbs.	

HOUSTON COUNTY, 2 MILES SOUTHEAST OF DOTHAN.

D. M. HATCHER.

Gray, sandy loam, with Yellowish, stiffer subsoil.

The land on which this experiment was made has been cleared about twelve years. The original forest trees were long-leaf pine. The land is reported as being subject to cotton wilt, but none was found this year. The preceding crops were oats in 1912, cotton in 1911, and corn and velvet beans in 1910.

The largest increase due to fertilizer, 568 pounds of seed cotton per acre, and the largest profit due to fertilizer, was obtained on Plot 9, fertilized with—

200 pounds cotton seed meal,
240 pounds acid phosphate, and
200 pounds kainit.

This fertilizer afforded a profit of \$18.91 per acre, or 311 per cent on the investment in fertilizer.

Kainit was the most effective constituent. The average increase due to kainit in four different combinations was 379 pounds of seed cotton per acre; to acid phosphate, 101 pounds per acre; and to cotton seed meal, 132 pounds of seed cotton per acre.

Cotton seed meal was more effective than nitrate of soda, the date of the application of the latter not being recorded. Mr. Hatcher states that there was more injury from disease on Plot 12, fertilized with nitrate than on any other plot, and that the stands were poor.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot	—24 lbs.
To acid phosphate plot	168 lbs.
To kainit plot	136 lbs.
To acid phosphate and kainit plot	246 lbs.
<i>Average increase with cotton seed meal</i>	132 lbs

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot	88 lbs.
To cotton seed meal plot	280 lbs.
To kainit plot	—8 lbs.
To cotton seed meal and kainit plot	52 lbs.
<i>Average increase with acid phosphate</i>	101 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	380 lbs.
To cotton seed meal plot.....	540 lbs.
To acid phosphate plot.....	284 lbs.
To cotton seed meal and acid phosphate plot.....	312 lbs.
<i>Average increase with kainit</i>	379 lbs.

Increase of seed cotton per acre from use of different quantities of kainit:

To use of 200 pounds kainit.....	312 lbs.
To use of 100 pounds kainit.....	228 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	246 lbs.
Increase from use of nitrate of soda.....	154 lbs.
Cotton seed meal better than nitrate of soda by.....	92 lbs.

Experiments in Houston and Crenshaw Counties.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	DOTHAN			LIVERNE		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
1	Lbs 200	Cotton seed meal ..	Lbs. 520	Lbs. —24	\$ 4.06	Lbs. 336	Lbs. 128	\$ 2.63
2	240	Acid phosphate.....	632	88	2.19	288	80	1.84
3	000	No fertilizer.....	544	-----	-----	208	-----	-----
4	200	Kainit.....	896	380	15.32	312	66	1.50
5	200	C. S. Meal.....	744	256	6.58	440	156	2.18
	240	Acid phosphate.....						
6	200	C. S. Meal.....	976	516	18.30	384	62	—1.67
	200	Kainit.....						
7	000	No fertilizer.....	482	-----	-----	360	-----	-----
8	240	Acid phosphate.....	824	372	13.29	344	14	—2.46
	200	Kainit.....						
9	200	C. S. Meal.....	1040	568	18.91	520	220	3.60
	240	Acid phosphate.....						
	200	Kainit.....						
10	200	C. S. Meal.....	976	484	15.92	488	218	4.21
	240	Acid phosphate.....						
11	100	Kainit.....	512	-----	-----	240	-----	-----
	000	No fertilizer.....						
12	240	Acid phosphate.....	904	392	11.87	464	224	4.48
	100	Kainit.....						
	100	Nitrate of soda ..						

CRENSHAW COUNTY, 1 MILE EAST OF LUVERNE.

F. L. HAWKINS.

Light colored sandy loam, with stiffer red subsoil.

This land had been long in cultivation. The original forest trees were long-leaf pine. Cotton had been the preceding crop for at least three years. The stand was uniform.

The largest profit, \$4.48, or 83 per cent on the investment in fertilizer, was obtained from Plot 12, where the fertilizer consisted of—

240 pounds acid phosphate,
100 pounds kainit, and
100 pounds nitrate of soda.

A profit of \$4.21 was made by the complete fertilizer used on Plot 10, and containing only a half dose of kainit.

The average increase due to cotton seed meal was 102 pounds of seed cotton per acre; to acid phosphate, 54 pounds. An average of all the plots receiving kainit gave no material gain; but in a complete fertilizer kainit, especially, at the rate of 100 pounds per acre, was profitable.

Nitrate of soda, applied in a complete fertilizer on June 28, was of about equal value to cotton seed meal applied in a complete fertilizer before planting.

An experiment was conducted by Mr. Hawkins in 1912 on similar land and, as in this year, the largest profit was obtained from an application of a complete fertilizer containing nitrate of soda on Plot 12.

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot.....	128 lbs.
To acid phosphate plot.....	76 lbs.
To kainit plot.....	—4 lbs.
To acid phosphate and kainit plot.....	206 lbs.
<i>Average increase with cotton seed meal</i>	102 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot.....	80 lbs.
To cotton seed meal plot.....	28 lbs.
To kainit plot.....	—52 lbs.
To cotton seed meal and kainit plot.....	158 lbs.
<i>Average increase with acid phosphate</i>	54 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	66 lbs.
To cotton seed meal plot.....	—66 lbs.
To acid phosphate plot.....	—66 lbs.
To cotton seed meal and acid phosphate plot.....	64 lbs.
<i>Average increase with kainit.....</i>	<u>—1 lb.</u>

Increase of seed cotton per acre from use of different quantities of kainit:

To use of 200 pounds kainit.....	64 lbs.
To use of 100 pounds kainit.....	62 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	206 lbs.
Increase from use of nitrate of soda.....	212 lbs.
Nitrate of soda better than cotton seed meal by.....	6 lbs.

CHOCTAW COUNTY, 6 MILES EAST OF WEST BUTLER.

R. F. SPARROW.

Sandy loam soil.

The extremely dry summer, the presence of boll weevils, and the late date of planting, May 9th, greatly reduced the yield and obscured the results due to fertilizers. However, the average figures show that nitrogen was the most effective constituent of the fertilizer under these conditions.

The plot affording the largest profit, \$2.98 per acre, or 100 per cent on the investment in fertilizer, was Plot 1, followed closely by Plot 10, fertilized with—

200 pounds cotton seed meal,
240 pounds acid phosphate, and
100 pounds kainit.

The latter fertilizer is probably more advisable in ordinary years than is the fertilizer used on Plot 1.

Experiment in Choctaw County.

			BUTLER		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	
1	200	Cotton seed meal	312	136	\$ 2.98
2	240	Acid phosphate	272	96	2.54
3	000	No fertilizer	176		
4	200	Kainit	216	30	-0.08
5	200	C. S. Meal	344	148	1.83
	240	Acid phosphate			
6	200	C. S. Meal	328	122	-0.97
	200	Kainit			
7	000	No fertilizer	216		
8	240	Acid phosphate	248	24	-2.02
	200	Kainit			
9	200	C. S. Meal	352	120	-0.80
	240	Acid phosphate			
10	200	Kainit	424	184	2.72
	240	Acid phosphate			
11	100	Kainit	248		
	000	No fertilizer			
12	240	Acid phosphate	400	152	1.31
	100	Kainit			
	100	Nitrate of soda			

Increase of seed cotton per acre when cotton seed meal was added:

To unfertilized plot	136 lbs.
To acid phosphate plot	52 lbs.
To kainit plot	92 lbs.
To acid phosphate and kainit plot	96 lbs.
<i>Average increase with cotton seed meal</i>	94 lbs.

Increase of seed cotton per acre when acid phosphate was added:

To unfertilized plot	96 lbs.
To cotton seed meal plot	12 lbs.
To kainit plot	-6 lbs.
To cotton seed meal and kainit plot	-28 lbs.
<i>Average increase with acid phosphate</i>	25 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	30 lbs.
To cotton seed meal plot	-14 lbs.
To acid phosphate plot	-72 lbs.

To cotton seed meal and acid phosphate plot.....	—28 lbs.
<i>Average increase with kainit</i>	—21 lbs.
Increase from use of cotton seed meal in complete fertilizer.....	6 lbs.
Increase from use of nitrate of soda.....	64 lbs.
Cotton seed meal better than nitrate of soda by.....	32 lbs.

INCONCLUSIVE EXPERIMENTS.

In GREENE COUNTY, W. L. and R. C. Lett, one mile east of Eutaw, conducted an experiment on Orangeburg sandy loam, with a red clay subsoil. The results were inconclusive because of the extremely dry year. However, they suggest that, in this dry year, kainit was the only fertilizer that was even fairly effective. (See page 191).

In WILCOX COUNTY, G. M. Cook, seven miles west of Camden, conducted an experiment on gray loam soil, with light-colored stiffer subsoil. The results were inconclusive because of the extremely dry season. (See page 191).

In CHOCTAW COUNTY, J. mile east of Silas, W. G. Edgar conducted an experiment on a gray, sandy loam soil, with reddish, stiffer subsoil. The results were inconclusive because of injury by boll weevil and excessive dry weather during the growing season. (See page 191).

In PERRY COUNTY, Mr. G. W. Thomas, two miles south of Marion, conducted an experiment on reddish loam soil, with yellowish clay subsoil. This proved inconclusive on account of extremely dry weather in summer. (See page 191).

In COFFEE COUNTY, an experiment by O. C. Smith at Elba, proved inconclusive because of damage done by cotton wilt. (See page 191).

In RUSSELL COUNTY, an experiment conducted by R. M. Mitchell at Hooks, proved inconclusive because of poor stand and injury by cotton wilt. (See page 191).

In MARENGO COUNTY, 3 miles north of Linden, an experiment conducted by W. W. Jackson proved inconclusive because of want of uniformity in the yields of the unfertilized plots. (See page 192).

In ELMORE COUNTY, $\frac{3}{4}$ miles east of Eclectic, W. A. Patterson conducted a test which proved inconclusive on account of difference in fertility between the different plots. (See table, page 192).

In ELMORE COUNTY, Mitchell Pittman made an experiment on poor gray, sandy soil, with yellow subsoil, located 4 miles north of Tallassee. The results were inconclusive on account of irregular stands and other conditions. (See table, page 192).

In CONEUCH COUNTY, near Evergreen, an experiment was conducted by J. J. Braxton. It proved inconclusive because of lack of uniformity in the soil, and mistakes in rate of applying fertilizer. (See page 192).

In HENRY COUNTY, $1\frac{1}{3}$ miles northwest of Headland, an experiment conducted by C. F. Wilkerson proved inconclusive because of damage due to a hailstorm. Yields in this test can be found on page 192.

