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OF THE

Alabama Polytechnic Institute

AUBURN

Local Fertilizer Experiments With Cotton in North Alabama in 1913

BY

J. F. DUGGAR,

J. T. WILLIAMSON, and

L. J. HAWLEY.

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LOCAL FERTILIZER EXPERIMENTS WITH COTTON IN NORTHERN ALABAMA IN 1913

BY

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

SUMMARY.

Bulletin No. 175 records the results of 32 fertilizer experiments with cotton conducted by the Alabama Experiment Station in the counties of the northern half of Alabama in 1913. Of these, 21 are regarded as conclusive.

In 17 conclusive experiments (that is, 81 per cent of the tests) cotton seed meal was needed and profitable.

In 12 experiments, phosphate was more effective than kainit; in 3 it was about equally as important as kainit; and in 2 tests, it was less effective than kainit, though needed; thus in 81 per cent of these experiments acid phosphate was needed to a greater or less extent.

In 2 experiments kainit was more important than phosphate, and in 3 cases it was about equally as effective as phosphate; and in 11 instances kainit, though needed, was less effective than phosphate; that is, in 76 per cent of these experiments, kainit was needed to a greater or less extent.

This table shows that, as a rule, the complete fertilizers (on plots 12, 10, and 9) were more profitable than cotton seed meal, acid phosphate, or kainit applied singly or in pairs. The complete fertilizers were also the most profitable applications in 1911 and 1912 in North Alabama.

In the general average it was more effective and more profitable in all three years to apply 100 pounds of kainit in a complete fertilizer (plot 10) than to use 200 pounds of kainit (Plot 9).

The average of the conclusive experiments shows that in 1913 in North Alabama 100 pounds of nitrate of soda applied after the plants were six inches high was more effective and profitable than was 200 pounds of cotton seed meal applied before planting.

The average results of 21 conclusive experiments are shown in the following table:

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.		Lbs.	
1	200	C. S. Meal.....	132	\$ 2.84
2	240	Acid Phosphate.....	172	5.89
3	000	No fertilizer.....	-----	-----
4	200	Kainit.....	69	1.49
5	200	C. S. Meal.....	219	4.54
	240	Acid Phosphate.....		
6	200	C. S. Meal.....	177	3.39
	200	Kainit.....		
7	000	No fertilizer.....	-----	-----
8	240	Acid Phosphate.....	193	5.42
	200	Kainit.....		
9	200	C. S. Meal.....	315	7.79
	240	Acid Phosphate.....		
	200	Kainit.....		
10	200	C. S. Meal.....	325	8.90
	240	Acid Phosphate.....		
	100	Kainit.....		
11	000	No fertilizer.....	-----	-----
12	240	Acid Phosphate.....	366	10.73
	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 combination of fertilizers for cotton, growing on each of the principal soils of the northern half of Alabama.

The results recorded in this bulletin were obtained in fertilizer experiments conducted with 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 northern half of the State. For convenience the counties grouped together in this bulletin are those lying north of the Central Prairie or Lime Region.

The results of fertilizer experiments made in the counties lying south of or within the Central Prairie Region appear in Bulletin No. 174 of this Station.

Local fertilizer tests constitute only one of many lines of exper-

iments 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 thus 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 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.

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.

There was a severe drought in August in most localities.

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

	Inches	Inches	Inches	Inches
Jan.	7.42	Apr.	2.25	July 3.95
Feb.	6.03	May 4.10	Aug. 2.59	Oct. 2.11
Mar.	7.00	June 3.69	Sept. 5.77	Nov. 1.25
				Dec.

LOCATION OF EXPERIMENTS.

COUNTY	POST OFFICE	NAME	PAGE
Bibb	Brent	James, J. D.	35
Blount	Oneonta	Harris, R. R.	44
Calhoun	Weavers	Eros, T.	24
Chambers	LaFayette	Tatum, A. A.	39
Cherokee	Cedar Bluff	Williamson, D. N.	27
Cherokee	Gaylesville	Westbrook, J. F.	25
Chilton	Thorsby	Foshee, R. M.	37
Colbert	Tuscumbia	Harris, G. H.	9
Coosa	Goodwater	Calloway, J. S.	44
Cullman	Hanceville	Brown, J. A.	21
DeKalb	Collinsville	Ventress, T. A.	44
Etowah	Gadsden	Able, D. C.	44
Etowah	Steele	Hawkins, J. T.	22
Fayette	Fayette	Bradley, J. Q.	44
Franklin	Russellville	Hester, R. A.	12
Lamar	Millport	Vail, P. H.	44
Lawrence	Courtland	Marion, P. H.	14
Limestone	Athens	Eighth Dist. Agr. School	11
Madison	Huntsville	Hoy, C. E.	44
Madison	Huntsville	Johnston, W. H.	45
Marion	Glen Allen	Letson, W. P.	45
Marion	Guin	Burleson, A. H.	19
Marshall	Boaz	Phillips, H. C.	18
Morgan	Hartselle	Hartsell, G. W.	16
Pickens	Reform	Langdon, T. W.	29
Pickens	Aliceville	Turnipseed, G. C.	41
Randolph	Roanoke	Longshore, W. O.	44
Shelby	Calera	Alexander, W. R.	32
Shelby	Columbiana	Choate, E. P.	34
St. Clair	Springville	Burks, J. P.	40
Tuscaloosa	Northport	Smith Bros.	44
Walker	Cordova	Alexander, G. L.	31

THE FERTILIZERS USED.

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

	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 employed in this Bulletin for calculating the increased yield, see Alabama Station Bulletin 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	Lbs.		Lbs.	Lbs.	Lbs.		
	200	Cotton seed meal.....	13.58	5.76	3.54	\$30 00	\$3.00
	<i>In 100 lbs. c. s. meal*</i> ..	6.79	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
	240	Acid phosphate.....					
		<i>In 100 lbs. above mixt</i> ..	3.09	10.04	0.80		
6	200	Cotton seed meal.....	13.58	5.76	28.14	22.00	4.40
	200	Kainit.....					
		<i>In 100 lbs. above mixt</i> ..	3.39	1.44	7.03		
8	240	Acid phosphate.....				13.99	3.08
	200	Kainit.....					
		<i>In 100 lbs. above mixt</i> ..		8.73	5.59		
9	240	Cotton seed meal.....	13.58	44.16	28.14	19.00	6.08
	200	Acid phosphate.....					
	200	Kainit.....	2.12	6.90	4.40		
10	200	Cotton seed meal.....	13.58	44.16	15.84	20.13	5.38
	240	Acid phosphate.....					
	100	Kainit.....	2.59	8.18	2.93		
		<i>In 100 lbs. above mixt</i> ..					
12	240	Acid phosphate.....	14.00	16.00	12.30	24.45	5.38
	100	Kainit.....					
	100	Nitrate of soda.....	3.18	8.73	2.80		
		<i>In 160 lbs. above mixt</i> ..					

*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 $1\frac{3}{14}$.

COLBERT COUNTY, 2 MILES EAST OF TUSCUMBIA.

G. H. HARRIS.

Dark clay valley soil, with red clay subsoil.

Recent crops on this land had been cotton.

The three largest increases in yield were afforded by Plots 10, 12, and 9, each of which received a complete fertilizer differing slightly in composition. The largest profit was afforded by that used on Plot 10, consisting of a complete fertilizer of

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

The largest profit due to fertilizers (Plot 10), was \$5.71 per acre, or 106 per cent on the investment in fertilizer.

July, August, and September were very dry, so that the full effects of the fertilizers were not shown.

The average increase due to cotton seed meal was 89 pounds of seed cotton per acre; to acid phosphate 80 pounds; and with kainit there was on the average a loss of 2 pounds. However, all three fertilizer constituents when used together in a complete fertilizer made a far better showing than indicated by the above figures. The complete fertilizers always showing a profit in spite of the extremely dry weather.

It is noticeable that 100 pounds of kainit in a complete fertilizer afforded a larger yield than did double this amount.

There were practically no rains worth mentioning after the nitrate was applied.

This is the third year that Mr. Harris has made the same experiment on exactly the same plots. In 1911 cotton caterpillars practically ruined the experiment, but even then nitrogen and phosphate were profitable. In 1912 nitrogen was the most important fertilizer constituent, but phosphate was somewhat effective.

Taking the three years' results as a whole, it would seem advisable to use on this soil the fertilizer employed on Plot 10.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	152 lbs.
To acid phosphate plot.....	—20 lbs.
To kainit plot.....	84 lbs.
To acid phosphate and kainit plot.....	140 lbs.
<i>Average increase with cotton seed meal</i>	89 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	128 lbs.
To cotton seed meal plot.....	—44 lbs.
To kainit plot.....	90 lbs.
To cotton seed meal and kainit plot.....	146 lbs.
<i>Average increase with acid phosphate</i>	80 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	—6 lbs.
To cotton seed meal plot.....	—74 lbs.
To acid phosphate plot.....	—44 lbs.
To cotton seed meal and acid phosphate plot....	116 lbs.
<i>Average increase with kainit</i>	—2 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	116 lbs.
From use of 100 pounds kainit.....	144 lbs.
Increase from use of cotton seed meal in complete fertilizer	140 lbs.
Increase from use of nitrate of soda.....	160 lbs.
Cotton seed meal better than nitrate of soda by.....	20 lbs.

Experiments in Colbert and Limestone Counties

			TUSCUMBIA			ATHENS		
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	432	152	\$ 3.69	768	32	\$-1.59
2	240	Acid phosphate	408	128	3.95	816	80	1.84
3	000	No fertilizer	280			736		
4	200	Kainit	312	-6	-1.66	640	-36	-2.98
5	200	C. S. Meal	464	108	0.07	600	-16	-5.38
	240	Acid phosphate						
6	200	C. S. Meal	472	78	-0.97	600	44	-2.46
	200	Kainit						
7	000	No fertilizer	432			496		
8	240	Acid phosphate	528	84	0.62	504	20	-2.20
	200	Kainit						
9	200	C. S. Meal	680	224	3.78	496	24	-5.02
	240	Acid phosphate						
	200	Kainit						
10	200	C. S. Meal	720	252	5.71	544	84	-1.68
	240	Acid phosphate						
	100	Kainit						
11	000	No fertilizer	480			448		
12	240	Acid phosphate	712	232	4.83	568	120	-0.10
	100	Kainit						
	100	Nitrate of soda						

LIMESTONE COUNTY, 1 MILE SOUTHEAST OF
ATHENS.

EIGHTH DISTRICT AGRICULTURAL SCHOOL

(W. R. NETTLES, Agriculturist.)

Red clay loam, with red clay subsoil.

This typical upland soil of the Tennessee Valley had been in cultivation for many years. The preceding crop was corn without cowpeas. There was so little rain during May, June, July, and August that none of the fertilizers were very effective.

In the two preceding years nitrogen had been the most effective fertilizer, but phosphate and potash had also been helpful, though to a smaller extent.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	32 lbs.
To acid phosphate plot.....	—96 lbs.
To kainit plot.....	80 lbs.
To acid phosphate and kainit plot.....	4 lbs.
<i>Average increase with cotton seed meal</i>	5 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	80 lbs.
To cotton seed meal plot.....	16 lbs.
To kainit plot.....	—56 lbs.
To cotton seed meal and kainit plot.....	—20 lbs.
<i>Average increase with acid phosphate</i>	5 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	—36 lbs.
To cotton seed meal plot.....	12 lbs.
To acid phosphate plot.....	—60 lbs.
To cotton seed meal and acid phosphate plot....	40 lbs.
<i>Average increase with kainit</i>	—11 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	40 lbs.
From use of 100 pounds kainit.....	100 lbs.
Increase from use of cotton seed meal in complete fertilizer	4 lbs.
Increase from use of nitrate of soda.....	40 lbs.
Nitrate of soda better than cotton seed meal by..	36 lbs.

FRANKLIN COUNTY, 4½ MILES EAST OF RUSSELLVILLE.

R. A. HESTER.

Reddish sandy clay, with reddish clay subsoil.

This upland soil had long been cleared of its original growth of hardwoods. For several years preceding this experiment it had been used for pasture. The season was dry.

On this pasture land well stocked with humus, acid phosphate was the fertilizer chiefly needed.

The average increase attributable to cotton seed meal was 82 pounds of seed cotton per acre; to acid phosphate 524 pounds; and to kainit only 38 pounds.

The largest profit per acre was obtained on Plot 2,

fertilized with only 240 pounds of acid phosphate. This afforded a profit of \$25.95 per acre, or 1545 per cent on the investment in fertilizer.

Every combination in which phosphate was used afforded a profit, usually above \$23.00 per acre. Doubtless most soils in the same vicinity which have been in cultivation are much more in need of nitrogen than was this pasture land.

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

To unfertilized plot.....	136 lbs.
To acid phosphate plot.....	4 lbs.
To kainit plot.....	88 lbs.
To acid phosphate and kainit plot.....	100 lbs.
<i>Average increase with cotton seed meal</i>	<u>82 lbs.</u>

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

To unfertilized plot.....	628 lbs.
To cotton seed meal plot.....	496 lbs.
To kainit plot.....	480 lbs.
To cotton seed meal and kainit plot.....	492 lbs.
<i>Average increase with acid phosphate</i>	<u>524 lbs.</u>

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	100 lbs.
To cotton seed meal plot.....	52 lbs.
To acid phosphate plot.....	—48 lbs.
To cotton seed meal and acid phosphate plot.....	48 lbs.
<i>Average increase with kainit</i>	<u>38 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.....	20 lbs.

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

100 lbs.

Increase from use of nitrate of soda.....

—16 lbs.

Cotton seed meal better than nitrate of soda by.. 116 lbs.

Experiments in Franklin and Lawrence Counties

			RUSSELLVILLE			COURTLAND		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cot-	Increase over	Profit from	Yield seed cot-	Increase over	Profit from
			ton per acre	unfertilized plot	fertilizer	ton per acre	unfertilized plot	fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	752	136	2.98	480	248	7.91
2	240	Acid phosphate	1244	628	25.95	264	32	0.27
3	000	No fertilizer	616			232		
4	200	Kainit	704	100	3.00	312	44	0.54
5	200	C. S. Meal	1244	632	23.13	496	192	3.77
	240	Acid phosphate						
6	200	C. S. Meal	768	188	3.87	480	140	1.76
	200	Kainit						
7	000	No fertilizer	568			376		
8	240	Acid phosphate	1104	580	22.44	456	54	0.70
	200	Kainit						
9	200	C. S. Meal	1160	680	23.84	768	340	8.88
	240	Acid phosphate						
10	200	Kainit	1088	652	23.31	784	330	9.14
	100	C. S. Meal						
11	000	No fertilizer	392			480		
12	240	Acid phosphate	928	536	18.20	864	384	11.52
	100	Kainit						
	100	Nitrate of soda						

**LAWRENCE COUNTY, 1 MILE SOUTH OF
COURTLAND.**

P. H. MARIAN.

Light red sandy loam, with red clay subsoil.

This sandier phase of the Tennessee valley soil had been in cultivation for many years. All recent crops had been cotton. The summer was very dry. The stand was uniform.

The largest increase, 384 pounds of seed cotton per acre, resulted from the use on Plot 12, of a complete fertilizer containing, per acre,

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

This plot also afforded the largest net profit due to

fertilizers, namely: \$11.52 per acre, or 214 per cent. on the investment in fertilizer. The next largest increases and profits were also obtained from the complete fertilizers employed on Plots 10 and 9. Evidently this soil needs a complete fertilizer.

In the complete fertilizer nitrogen was in 1913 the most important constituent, but phosphate and potash were also profitable.

In the complete fertilizer 100 pounds of kainit was practically as effective and actually more profitable, than double this amount.

Nitrate of soda at the rate of 100 pounds per acre applied June 24th, afforded a larger yield than did 200 pounds of cotton seed meal used before planting.

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

To unfertilized plot.....	248 lbs.
To acid phosphate plot.....	160 lbs.
To kainit plot.....	96 lbs.
To acid phosphate and kainit plot.....	286 lbs.

Average increase with cotton seed meal..... 198 lbs.

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

To unfertilized plot.....	32 lbs.
To cotton seed meal plot.....	—56 lbs.
To kainit plot.....	10 lbs.
To cotton seed meal and kainit plot.....	200 lbs.

Average increase with acid phosphate..... 47 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	44 lbs.
To cotton seed meal plot.....	—108 lbs.
To acid phosphate plot.....	22 lbs.
To cotton seed meal and acid phosphate plot....	148 lbs.

Average increase with kainit..... 27 lbs.

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

From use of 200 pounds kainit.....	148 lbs.
From use of 100 pounds kainit.....	138 lbs.

Increase from use of cotton seed meal in complete fertilizer 286 lbs.

Increase from use of nitrate of soda..... 340 lbs.

Nitrate of soda better than cotton seed meal by . . . 54 lbs.

MORGAN COUNTY, 1 MILE EAST OF HARTSELLE.

G. W. HARTSELL.

Fine sandy loam, with yellow clay subsoil.

This upland had been in cultivation for about 25 years, but had not been cultivated in 1912. The summer was one of the driest ever experienced and some rust was present, being worse where there was no kainit. Very little rain fell between June 15 and September 30. This probably explains why there was not a larger increase in crop from the use of either nitrogen or phosphate.

The three plots which received a complete fertilizer (Plots 12, 10, and 9) afforded the largest increase in yield. The largest profit was afforded by Plot 12, fertilized with

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

On this plot the profit due to fertilizer was \$9.40 per acre, or 175 per cent on the investment in fertilizer.

The average increase due to cotton seed meal in this dry year was only 5 pounds; to acid phosphate 74 pounds; and to kainit 209 pounds.

In spite of the effectiveness of kainit and the dryness of the season, 100 pounds of kainit was fully as useful as 200 pounds.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	—96 lbs.
To acid phosphate plot.....	74 lbs.
To kainit plot.....	38 lbs.
To acid phosphate and kainit plot.....	4 lbs.
<i>Average increase with cotton seed meal</i>	5 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	12 lbs.
To cotton seed meal plot.....	182 lbs.
To kainit plot.....	65 lbs.
To cotton seed meal and kainit plot.....	31 lbs.
<i>Average increase with acid phosphate</i>	75 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	167 lbs.

To cotton seed meal plot.....	301 lbs.
To acid phosphate plot.....	220 lbs.
To cotton seed meal and acid phosphate plot....	150 lbs.

Average increase with kainit..... 209 lbs.

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

From use of 200 pounds kainit..... 150 lbs.

From use of 100 pounds kainit..... 162 lbs.

Increase from use of cotton seed meal in complete fertilizer 4 lbs.

Increase from use of nitrate of soda..... 92 lbs.

Nitrate of soda better than cotton seed meal by.. 88 lbs.

Experiments in Morgan and Marshall Counties.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	HARTSELE			BOAZ		
			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. 384	Lbs. —96	\$-7.22	Lbs. 728	Lbs. 400	\$ 14.60
2	240	Acid phosphate	492	12	-1.15	488	160	5.36
3	000	No fertilizer	480			328		
4	200	Kainit	632	167	5.95	400	70	1.68
5	200	C. S. Meal	536	86	-0.90	472	140	1.48
	240	Acid phosphate						
6	200	C. S. Meal	640	205	4.62	704	370	11.88
	200	Kainit						
7	000	No fertilizer	420			336		
8	240	Acid phosphate	628	232	7.13	560	220	6.60
	200	Kainit						
9	200	C. S. Meal	608	236	4.30	728	284	6.42
	240	Acid phosphate						
	200	Kainit						
10	200	C. S. Meal	596	248	5.53	784	436	13.80
	240	Acid phosphate						
11	100	Kainit	324			352		
	000	No fertilizer						
	240	Acid phosphate						
12	100	Kainit	660	336	9.40	816	464	15.04
	100	Nitrate of soda						

MARSHALL COUNTY, 2½ MILES EAST OF BOAZ.

H. C. PHILLIPS.

Gray sandy loam, with yellow sandy subsoil.

This upland soil had been cleared about 20 years. The preceding crop was corn. Dry weather the early part of August did some damage.

The largest increase, 464 pounds of seed cotton per acre; a profit of \$15.04 per acre, or 278 per cent on the investment in fertilizer, was obtained on Plot 12, which received a complete fertilizer containing

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

The second largest increase, 436 pounds of seed cotton per acre, was also obtained from a complete fertilizer.

The average increase attributable to cotton seed meal was 186 pounds of seed cotton per acre; to acid phosphate, 34 pounds; and to kainit, 61 pounds.

An application of 100 pounds of kainit was more effective than 200 pounds when applied in a complete fertilizer.

Nitrate of soda applied June 28 was slightly more effective than was cotton seed meal applied before planting.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	400 lbs.
To acid phosphate plot.....	—20 lbs.
To kainit plot.....	300 lbs.
To acid phosphate and kainit plot.....	64 lbs.
<i>Average increase with cotton seed meal</i>	186 lbs.

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	160 lbs.
To cotton seed meal plot.....	—260 lbs.
To kainit plot.....	150 lbs.
To cotton seed meal and kainit plot.....	86 lbs.
<i>Average increase with acid phosphate</i>	34 lbs.

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	70 lbs.

To cotton seed meal plot.....	—30 lbs.
To acid phosphate plot.....	60 lbs.
To cotton seed meal and acid phosphate plot....	144 lbs.
<i>Average increase with kainit.....</i>	<u>61 lbs.</u>
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	144 lbs.
From use of 100 pounds kainit.....	296 lbs.
Increase from use of cotton seed meal in complete fertilizer	
	64 lbs.
Increase from use of nitrate of soda.....	
	92 lbs.
Nitrate of soda better than cotton seed meal by..	28 lbs.

MARION COUNTY, 5 MILES NORTH OF GUIN.

A. H. BURLESON

Light reddish loam, with stiff red subsoil.

This oak and hickory upland had been in cultivation for many years. Recent crops had been cotton.

The largest increase and the largest profit due to fertilizers were obtained on Plot 12, which received a complete fertilizer including nitrate of soda. On this plot the increase was 392 pounds of seed cotton per acre; the net profit due to fertilizers was \$11.87 per acre, or 221 per cent on the investment in fertilizer.

The average increase attributable to cotton seed meal was 112 pounds of seed cotton per acre; to acid phosphate only 10 pounds; and with kainit there was on the average a loss of 30 pounds.

Nitrate of soda at the rate of 100 pounds per acre applied June 20, was much more effective and profitable than 200 pounds of cotton seed meal applied before planting.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	252 lbs.
To acid phosphate plot.....	82 lbs.
To kainit plot.....	30 lbs.
To acid phosphate and kainit plot.....	84 lbs.
<i>Average increase with cotton seed mea.....</i>	<u>112 lbs.</u>

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	96 lbs.

To cotton seed meal plot..... —74 lbs.
 To kainit plot..... —19 lbs.
 To cotton seed meal and kainit plot..... 35 lbs.

Average increase with acid phosphate..... 10 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot..... 83 lbs.
 To cotton seed meal plot..... —139 lbs.
 To acid phosphate plot —32 lbs.
 To cotton seed meal and acid phosphate plot.... —30 lbs.

Average increase with kainit..... —30 lbs.

Increase from use of cotton seed meal in complete fertilizer 84 lbs.
 Increase from use of nitrate of soda..... 316 lbs.
 Nitrate of soda better than cotton seed meal by.. 232 lbs.

Experiments in Marion and Cullman Counties

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	GUIN			HANCEVILLE		
			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. 920	Lbs. 252	\$ 8.09	Lbs. 464	Lbs. —16	\$ —3.70
2	240	Acid phosphate	764	96	2.54	632	152	5.01
3	000	No fertilizer	668			480		
4	200	Kainit	744	83	2.25	528	48	0.71
5	200	C. S. Meal	832	178	3.15	584	104	—0.10
	240	Acid phosphate						
6	200	C. S. Meal	760	113	0.57	632	152	2.29
	200	Kainit						
7	000	No fertilizer	640			480		
8	240	Acid phosphate	736	64	—0.26	688	214	6.34
	200	Kainit						
9	200	C. S. Meal	852	148	0.43	728	260	5.36
	240	Acid phosphate						
10	200	Kainit	896	160	1.66	864	402	12.31
	100	Kainit						
11	000	No fertilizer	768			456		
12	240	Acid phosphate	1160	392	11.87	888	432	13.63
	100	Kainit						
	100	Nitrate of soda						

CULLMAN COUNTY, 1 MILE EAST OF HANCEVILLE.

J. A. BROWN.

Light gravelly loam, with red clay subsoil.

This land had been in cultivation about 17 years. Recent crops had been cotton.

The largest increase and the largest profit per acre were obtained on Plot 12. This plot received a complete fertilizer containing nitrate of soda, and afforded an increase of 432 pounds of seed cotton per acre, which gave a net profit of \$13.63 per acre, or 253 per cent on the investment in fertilizer.

The average increase due to cotton seed meal was 22 pounds of seed cotton per acre; to acid phosphate, 137 pounds; and to kainit, 109 pounds.

Apparently this soil needs a complete fertilizer, but one containing only 100 pounds of kainit.

Nitrate of soda applied after growth begun was slightly more effective than cotton seed meal.

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

To unfertilized plot.....	—16 lbs.
To acid phosphate plot.....	—48 lbs.
To kainit plot.....	104 lbs.
To acid phosphate and kainit plot.....	46 lbs.

Average increase with cotton seed meal 22 lbs.

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

To unfertilized plot.....	152 lbs.
To cotton seed meal plot.....	120 lbs.
To kainit plot.....	166 lbs.
To cotton seed meal and kainit plot.....	108 lbs.

Average increase with acid phosphate 137 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	48 lbs.
To cotton seed meal plot.....	168 lbs.
To acid phosphate plot.....	62 lbs.
To cotton seed meal and acid phosphate plot....	156 lbs.

Average increase with kainit 109 lbs.

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

From use of 200 pounds kainit.....	156 lbs.
------------------------------------	----------

From use of 100 pounds kainit.....	298 lbs.
Increase from use of cotton seed meal in complete fertilizer	46 lbs.
Increase from use of nitrate of soda.....	76 lbs.
Nitrate of soda better than cotton seed meal by..	30 lbs.

ETOWAH COUNTY, 3½ MILES EAST OF STEELE.

J. T. HAWKINS.

Yellowish-brown flatwoods soil, with very stiff reddish clay subsoil.

This land was selected as typical flatwoods soil mapped by the U. S. Bureau of Soils as Conasauga Clay. There was much rain in the latter part of June and also in the latter part of July.

All three of the plots receiving complete fertilizers (Plots 12, 9, and 10) lead in productiveness and in profit.

The largest profit was afforded by Plot 12, fertilized with

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

Plot 12 afforded a profit of \$7.29 per acre, or 135 per cent on the investment in fertilizer. This soil evidently needs a complete fertilizer.

The average increase attributable to cotton seed meal is 105 pounds of seed cotton per acre; to acid phosphate, 91 pounds; and to kainit, 64 pounds.

In a complete fertilizer 100 pounds of kainit was about as effective as double this amount.

Nitrate of soda at the rate of 100 pounds per acre applied July 9, was slightly more effective than double this amount of cotton seed meal employed before planting.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	160 lbs.
To acid phosphate plot.....	80 lbs.
To kainit plot.....	80 lbs.
To acid phosphate and kainit plot.....	100 lbs.
<i>Average increase with cotton seed meal.....</i>	<u>105 lbs.</u>

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	128 lbs.
To cotton seed meal plot.....	48 lbs.

To kainit plot..... 84 lbs.
 To cotton seed meal and kainit plot..... 104 lbs.

Average increase with acid phosphate..... 91 lbs.

Increase of seed cotton per acre when kainit was added:
 To unfertilized plot..... 88 lbs.
 To cotton seed meal plot..... 8 lbs.
 To acid phosphate plot..... 44 lbs.
 To cotton seed meal and acid phosphate plot..... 64 lbs.

Average increase with kainit..... 51 lbs.

Increase of seed cotton per acre from use of different quantities of kainit:
 From use of 200 pounds kainit..... 64 lbs.
 From use of 100 pounds kainit..... 60 lbs.
 Increase from use of cotton seed meal in complete fertilizer 100 lbs.
 Increase from use of nitrate of soda..... 120 lbs.
 Nitrate of soda better than cotton seed meal by.. 20 lbs.

Experiments in Etowah and Calhoun Counties.

			STEELE *			WEAVER		
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	784	160	4.04	576	-32	-4.41
2	240	Acid phosphate	752	128	3.95	710	102	2.81
3	000	No fertilizer	624			608		
4	2.0	Kainit	696	88	2.47	720	96	2.82
5	200	C. S. Meal	800	208	4.47	888	248	6.23
	240	Acid phosphate						
6	200	C. S. Meal	744	168	2.99	736	80	-0.88
	200	Kainit						
7	000	No fertilizer	560			672		
8	240	Acid phosphate	736	172	4.49	816	102	1.41
	200	Kainit						
	200	C. S. Meal						
9	240	Acid phosphate	840	272	5.89	1056	300	7.12
	200	Kainit						
	200	C. S. Meal						
10	240	Acid phosphate	840	268	6.41	1104	306	8.08
	100	Kainit						
11	000	No fertilizer	576			840		
	240	Acid phosphate						
12	100	Kainit	864	288	7.29	1296	456	14.68
	100	Nitrate of soda						

* Farm in Etowah county.

CALHOUN COUNTY, 1½ MILES WEST OF WEAVER.

T. EROS.

Red gravelly clay loam, with red clay subsoil.

This land had been many years in cultivation. The preceding crop was oats followed by cowpeas cut for hay.

The largest increase and the largest profit was made on Plot 12, which received a complete fertilizer containing nitrate of soda. On this plot the increase was 456 pounds of seed cotton per acre, and the profit \$14.68, or 273 per cent on the investment in fertilizer.

The average increase attributable to cotton seed meal was 74 pounds of seed cotton per acre; to acid phosphate, 152 pounds; and to kainit, 65 pounds.

100 pounds of kainit was just as effective in a complete fertilizer as 200 pounds.

Nitrate of soda applied at the rate of 100 pounds per acre June 21, was much more effective than double this amount of cotton seed meal applied before planting.

It should be noted that even where cowpea stubble was plowed under a few months before there was yet a good profit from application of either cotton seed meal or nitrate of soda.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	—32 lbs.
To acid phosphate plot.....	146 lbs.
To kainit plot.....	—16 lbs.
To acid phosphate and kainit plot.....	198 lbs.

Average increase with cotton seed meal..... 74 lbs.

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	102 lbs.
To cotton seed meal plot.....	280 lbs.
To kainit plot.....	6 lbs.
To cotton seed meal and kainit plot.....	220 lbs.

Average increase with acid phosphate..... 152 lbs.

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	96 lbs.
To cotton seed meal plot.....	112 lbs.
To acid phosphate plot.....	000 lbs.
To cotton seed meal and acid phosphate plot.....	52 lbs.

Average increase with kainit..... 65 lbs.

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

From use of 200 pounds kainit.....	52 lbs.
From use of 100 pounds kainit.....	58 lbs.
Increase from use of cotton seed meal in complete fertilizer	198 lbs.
Increase from use of nitrate of soda.....	348 lbs.
Nitrate of soda better than cotton seed meal by..	150 lbs.

CHEROKEE COUNTY, 6 MILES NORTH OF
LAWRENCE, NEAR GAYLESVILLE.

J. F. WESTBROOK

Gray, sandy, valley soil with reddish, stiffer subsoil.

The stand was uniform. The season was very dry. The soil is apparently that which is mapped by the U. S. Department of Agriculture, Bureau of Soils, as Hagers-town Loam. This is the second year in which Mr. Westbrook has made the experiment on the same plots.

In both years the largest profit was made on Plot 12, receiving per acre

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

In 1913 this plot afforded a profit due to fertilizers of \$18.56 per acre, or 345 per cent on the investment in fertilizers.

The average increase due to cotton seed meal was 135 pounds of seed cotton per acre; and to acid phosphate, 189 pounds. Kainit, in most combinations, was not helpful, but in the complete fertilizer kainit was profitable. 100 pounds of kainit was fully as effective in the complete fertilizer as 200 pounds.

Nitrate of soda at the rate of 100 pounds per acre applied July 1, or about two months after planting, was much more effective than double this amount of cotton seed meal applied before planting.

In the preceding year nitrogen was the main fertilizer constituent needed.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	312 lbs.
To acid phosphate plot.....	—108 lbs.
To kainit plot.....	180 lbs.
To acid phosphate and kainit plot.....	154 lbs.
<i>Average increase with cotton seed meal</i>	135 lbs.
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	360 lbs.
To cotton seed meal plot.....	—60 lbs.
To kainit plot.....	240 lbs.
To cotton seed meal and kainit plot.....	214 lbs.
<i>Average increase with acid phosphate</i>	189 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	2 lbs.
To cotton seed meal plot.....	—130 lbs.
To acid phosphate plot.....	—118 lbs.
To cotton seed meal and acid phosphate plot....	144 lbs.
<i>Average increase with kainit</i>	—26 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	144 lbs.
From use of 100 pounds kainit.....	154 lbs.
Increase from use of cotton seed meal in complete fertilizer	154 lbs.
Increase from use of nitrate of soda.....	292 lbs.
Nitrate of soda better than cotton seed meal by..	138 lbs.

Experiments in Cherokee County.

			GAYLESVILLE			CEDAR BLUFF		
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	648	312	\$10.73	616	216	\$ 6.50
2	240	Acid phosphate	696	360	14.16	736	339	13.10
3	000	No fertilizer	336	-----	-----	400	-----	-----
4	200	Kainit	416	2	-1.31	464	84	2.30
5	200	C. S. Meal	744	252	6.41	824	464	15.74
	240	Acid phosphate						
6	200	C. S. Meal	752	182	3.61	528	188	3.87
	200	Kainit						
7	000	No fertilizer	648	-----	-----	320	-----	-----
8	240	Acid phosphate	864	242	7.57	648	312	10.65
	200	Kainit						
9	200	C. S. Meal	992	396	11.34	800	448	13.63
	240	Acid phosphate						
10	200	Kainit	976	406	12.48	744	376	11.16
	240	Acid phosphate						
11	000	No fertilizer	545	-----	-----	384	-----	-----
12	240	Acid phosphate	1088	544	18.56	824	440	13.98
	100	Kainit						
	100	Nitrate of soda						

CHEROKEE COUNTY, 1½ MILES SOUTHEAST
OF CEDAR BLUFF.

D. N. WILLIAMSON.

Dark gray loam, with red clay subsoil.

The old land on which this experiment was made had been in cotton the two preceding years. The original forest trees were oak, hickory, and short leaf pine. The land is not subject to any special disease.

A similar experiment was conducted on these same plots by Paul Bishop in 1912.

The largest increase, 464 pounds of seed cotton per acre, and the largest profit, \$15.74 or 341 per cent on the investment in fertilizer, was obtained on Plot 5, where an application of 200 pounds of cotton seed meal and 240 pounds of acid phosphate was used. Profits of \$13.98 and \$13.63 were obtained from Plots 12 and 9, where an ap-

plication of a complete fertilizer was used. A larger profit was obtained where nitrate of soda was applied about July 1, than where cotton seed meal was used in a complete fertilizer before planting.

The average increase of seed cotton per acre, due to cotton seed meal, was 146 pounds; to acid phosphate, 268 pounds; and to kainit, only 4 pounds.

In 1912 the largest profit was obtained from an application of a complete fertilizer containing

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

The second largest profit was obtained from an application of

200 pounds cotton seed meal,
240 pounds acid phosphate.

If conclusions may be drawn from the two years' experimentation, the writers believe that kainit is not needed on this soil.

Chemical analysis made of soil of the unfertilized plots, both in 1912 and 1913, showed that this soil contained an average of 0.16 per cent of potash (K_2O); this is equal to fully 3200 pounds of total potash in the upper six inches of soil over one acre.

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

To unfertilized plot.....	216 lbs.
To acid phosphate plot.....	128 lbs.
To kainit plot.....	104 lbs.
To acid phosphate and kainit plot.....	136 lbs.

Average increase with cotton seed meal..... 146 lbs.

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

To unfertilized plot.....	336 lbs.
To cotton seed meal plot.....	248 lbs.
To kainit plot.....	228 lbs.
To cotton seed meal and kainit plot.....	260 lbs.

Average increase with acid phosphate..... 268 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	84 lbs.
To cotton seed meal plot.....	—28 lbs.
To acid phosphate plot.....	—24 lbs.

To cotton seed meal and acid phosphate plot....	—16 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.....	—16 lbs.
From use of 100 pounds kainit.....	—88 lbs.
Increase from use of cotton seed meal in complete fertilizer	136 lbs.
Increase from use of nitrate of soda.....	200 lbs.
Nitrate of soda better than cotton seed meal by..	64 lbs.

PICKENS COUNTY, 1½ MILES NORTHEAST OF REFORM.

T. W. LANGDON.

Fine sandy soil, with fine sandy subsoil.

This old land had been long in cultivation. The original forest trees were oak and hickory. Cotton on this land is subject to rust, though little damage was done by this disease in 1913.

The largest increase, 368 pounds of seed cotton per acre, and the largest profit, \$10.11, or 166 per cent on the investment in fertilizers was obtained on Plot 9, from the use of a complete fertilizer, containing 200 pounds of kainit. Profits of \$10.10 and \$10.03 were obtained from Plots 5 and 6 respectively.

The average increase due to cotton seed meal was 240 pounds of seed cotton per acre; to kainit, 92 pounds; while with acid phosphate there was a loss of 4 pounds of seed cotton per acre, probably due to the peculiar character of the season.

Cotton seed meal in a complete fertilizer applied before planting was more effective by 208 pounds of seed cotton per acre than was an application of nitrate of soda on June 15th.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	144 lbs.
To acid phosphate plot.....	304 lbs.
To kainit plot.....	96 lbs.
To acid phosphate and kainit plot.....	416 lbs.
<i>Average increase with cotton seed meal</i>	240 lbs.
Increase of seed cotton per acre when acid phosphate was added:	

To unfertilized plot.....	32 lbs.
To cotton seed meal plot.....	192 lbs.
To kainit plot.....	—280 lbs.
To cotton seed meal and kainit plot.....	40 lbs.

Average increase with acid phosphate ----- -4 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	232 lbs.
To cotton seed meal plot.....	184 lbs.
To acid phosphate plot.....	—80 lbs.
To cotton seed meal and acid phosphate plot....	32 lbs.

Average increase with kainit ----- 92 lbs.

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

From use of 200 pounds kainit.....	32 lbs.
From use of 100 pounds kainit.....	00 lbs.

Increase from use of cotton seed meal in complete fertilizer

416 lbs.

Increase from use of nitrate of soda.....

208 lbs.

Cotton seed meal better than nitrate of soda by.. 208 lbs.

Experiments in Pickens and Walker Counties.

			REFORM			CORDOVA		
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	544	144	\$ 3.34	672	112	\$ 1.93
2	240	Acid phosphate	432	52	—0.27	704	144	4.66
3	000	No fertilizer	400			560		
4	200	Kainit	672	232	8.81	560	000	—1.40
5	200	C. S. Meal	816	336	10.10	800	240	5.8
	240	Acid phosphate						
6	200	C. S. Meal	848	328	10.03	800	240	6.16
	200	Kainit						
7	000	No fertilizer	560			560		
8	240	Acid phosphate	480	—48	—5.19	704	136	2.90
	200	Kainit						
9	200	C. S. Meal	864	368	10.11	896	320	8.00
	240	Acid phosphate						
10	200	C. S. Meal	800	336	9.40	928	344	9.76
	240	Acid phosphate						
11	100	Kainit	432			592		
	000	No fertilizer						
12	240	Acid phosphate	560	128	0.25	1104	512	17.15
	100	Kainit						
	100	Nitrate of soda						

WALKER COUNTY, 3 MILES SOUTH OF CORDOVA.

G. L. ALEXANDER.

Sandy loam soil, with red clay subsoil,

This upland soil had been long in cultivation. The original timber had been oak, chestnut, and short leaf pine.

The largest increase, 512 pounds of seed cotton per acre, was obtained on Plot 12, fertilized with a complete fertilizer containing nitrate of soda. This plot also afforded the largest net profit, \$17.15 per acre, or a net profit of 319 per cent on the investment in fertilizer.

The average increase attributable to cotton seed meal was 158 pounds of seed cotton per acre; to acid phosphate, 122 pounds; and to kainit, only 50 pounds.

100 pounds of kainit was slightly more effective than 200 pounds.

Nitrate of soda applied at the rate of 100 pounds per acre was much more effective than 200 pounds of cotton seed meal applied before planting. Note the early date, June 7, on which the nitrate was applied.

This is the second year that Mr. Alexander has made this experiment on the same plots; he also conducted an experiment on similar soil but different plots in 1911. Both in 1912 and 1913 a complete fertilizer containing only 100 pounds of kainit afforded the largest profit; the results in 1911 agree with those of the other two years in showing the greater need for nitrogen and for acid phosphate than for potash. Indeed in 1911 there was no financial loss in omitting potash entirely.

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

To unfertilized plot.....	112 lbs.
To acid phosphate plot.....	96 lbs.
To kainit plot.....	240 lbs.
To acid phosphate and kainit plot.....	184 lbs.

Average increase with cotton seed meal 158 lbs.

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

To unfertilized plot.....	144 lbs.
To cotton seed meal plot.....	128 lbs.
To kainit plot.....	136 lbs.

To cotton seed meal and kainit plot.....	80 lbs.
<i>Average increase with acid phosphate</i>	122 lbs.
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	000 lbs.
To cotton seed meal plot.....	128 lbs.
To acid phosphate plot.....	—8 lbs.
To cotton seed meal and acid phosphate plot....	80 lbs.
<i>Average increase with kainit</i>	50 lbs.
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	80 lbs.
From use of 100 pounds kainit.....	104 lbs.
Increase from use of cotton seed meal in complete fertilizer	
	184 lbs.
Increase from use of nitrate of soda.....	
	352 lbs.
Nitrate of soda better than cotton seed meal by..	168 lbs.

SHELBY COUNTY, 3 MILES WEST OF CALERA.

W. R. ALEXANDER.

Dark gray loam with dark yellow subsoil

Rust did some damage on Plots, 3, 5, 7, 10, 11, and 12, being worst on Plot 5. The stand was good.

The largest profits, \$18.39, were obtained on Plot 6 fertilized with 200 pounds cotton seed meal and 200 pounds kainit, and on Plot 8 fertilized with 240 pounds acid phosphate and 200 pounds kainit.

The largest average increase was due to kainit, which made an average of 361 pounds of seed cotton per acre. The average increase, attributable to acid phosphate, was 107 pounds of seed cotton per acre; to cotton seed meal, 102 pounds of seed cotton per acre.

Cotton seed meal was more effective, when applied in a complete fertilizer before planting than was nitrate of soda applied June 21. The plot on which nitrate was used is believed to be on poorer soil.

Marked increases and profits were secured in every case where kainit was used.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot.....	80 lbs.

To acid phosphate plot.....	108 lbs.
To kainit plot.....	180 lbs.
To acid phosphate and kainit plot.....	40 lbs.

Average increase with cotton seed meal ----- 102 lbs.

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

To unfertilized plot.....	120 lbs.
To cotton seed meal plot.....	148 lbs.
To kainit plot.....	150 lbs.
To cotton seed meal and kainit plot.....	10 lbs.

Average increase with acid phosphate ----- 107 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	338 lbs.
To cotton seed meal plot.....	438 lbs.
To acid phosphate plot.....	368 lbs.
To cotton seed meal and acid phosphate plot.....	300 lbs.

Average increase with kainit ----- 361 lbs.

Experiments in Shelby County.

			CALERA			COLUMBIANA		
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	632	80	0.52	624	272	8.97
2	240	Acid phosphate	672	120	3.60	688	335	13.10
3	000	No fertilizer	552			352		
4	200	Kainit	856	338	13.47	384	64	1.42
5	200	C. S. Meal	712	228	5.35	608	320	9.40
	240	Acid phosphate						
6	200	C. S. Meal	968	518	18.39	384	128	1.23
	200	Kainit						
7	000	No fertilizer	416			224		
8	240	Acid phosphate	896	488	18.39	432	226	6.86
	200	Kainit						
9	200	C. S. Meal	928	528	17.15	608	420	12.40
	240	Acid phosphate						
10	200	Kainit				592	422	13.19
	100	C. S. Meal						
11	000	No fertilizer	384			152		
12	240	Acid phosphate				400	248	5.53
	100	Kainit						
	100	Nitrate of soda						

SHELBY COUNTY, 1½ MILES SOUTH OF
COLUMBIANA.

E. P. CHOATE.

Light reddish gravelly soil, with red gravelly clay subsoil.

This upland had been cleared about 12 years. The complete fertilizers (Plots 9 and 10) afforded the largest increase in yield.

The largest profit, \$13.19 per acre, or 245 per cent on the investment in fertilizer, was afforded by Plot 10, which received a complete fertilizer in which there was only 100 pounds of kainit per acre.

The average increase due to cotton seed meal was 129 pounds of seed cotton per acre; to acid phosphate, 210 pounds; and to kainit, 23 pounds.

The smaller amount of kainit was as effective as the larger amount.

Cotton seed meal was much more effective than nitrate of soda; this difference may be partly due to the fact that cotton on all plots was plowed up May 28, and replanted at this late date.

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

To unfertilized plot.....	272 lbs.
To acid phosphate plot.....	—16 lbs.
To kainit plot.....	64 lbs.
To acid phosphate and kainit plot.....	194 lbs.

Average increase with cotton seed meal..... **129 lbs.**

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

To unfertilized plot.....	336 lbs.
To cotton seed meal plot.....	48 lbs.
To kainit plot.....	162 lbs.
To cotton seed meal and kainit plot.....	292 lbs.

Average increase with acid phosphate..... **210 lbs.**

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	64 lbs.
To cotton seed meal plot.....	—144 lbs.
To acid phosphate plot.....	—110 lbs.
To cotton seed meal and acid phosphate plot....	100 lbs.

Average increase with kainit..... **—23 lbs.**

Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	100 lbs.
From use of 100 pounds kainit.....	102 lbs.
Increase from use of cotton seed meal in complete fertilizer	194 lbs.
Increase from use of nitrate of soda.....	20 lbs.
Cotton seed meal better than nitrate of soda by..	174 lbs.

BIBB COUNTY, 1/2 MILE SOUTH OF BRENT.

J. D. JAMES.

Gray loam, with reddish subsoil.

This land had been in cultivation for many years. The preceding crop was corn and peas.

The largest increase, 472 pounds of seed cotton per acre, was afforded by Plot 12, receiving a complete fertilizer containing nitrate of soda. This combination also afforded the largest profit, \$15.39 per acre, or 286 per cent on the investment in fertilizer.

The next largest profits, \$8.70 and \$8.52 per acre are shown by two other plots receiving complete fertilizers, numbers 9 and 10.

The average increase attributable to cotton seed meal was 151 pounds of seed cotton per acre; to acid phosphate, 141 pounds; and to kainit, 57 pounds.

Kainit at the rate of 100 pounds was practically as profitable as double this rate.

Nitrate of soda at the rate of 100 pounds per acre was much more profitable than was 200 pounds of cotton seed meal applied at the time of planting. Note the rather early date at which nitrate of soda was applied, June 10, to cotton planted May 2.

This is the second year that Mr. James has conducted a fertilizer experiment on cotton. Although the land used in 1913 is described as a grayish loam and that used in 1912 as a reddish loam, the results of the two years agree in showing that complete fertilizers were most profitable and that 100 pounds of kainit was about as effective as double this amount.

Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot	72 lbs.
To acid phosphate plot.....	136 lbs.
To kainit plot.....	192 lbs.
To acid phosphate and kainit plot.....	204 lbs.
<i>Average increase with cotton seed meal</i>	<u>152 lbs.</u>
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot.....	112 lbs.
To cotton seed meal plot.....	176 lbs.
To kainit plot.....	132 lbs.
To cotton seed meal and kainit plot.....	144 lbs.
<i>Average increase with acid phosphate</i>	<u>141 lbs.</u>
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot.....	000 lbs.
To cotton seed meal plot.....	120 lbs.
To acid phosphate plot.....	20 lbs.
To cotton seed meal and acid phosphate plot....	88 lbs.
<i>Average increase with kainit</i>	<u>57 lbs.</u>
Increase of seed cotton per acre from use of different quantities of kainit:	
From use of 200 pounds kainit.....	88 lbs.
From use of 100 pounds kainit.....	68 lbs.
Increase from use of cotton seed meal in complete fertilizer	
	204 lbs.
Increase from use of nitrate of soda.....	
	360 lbs.
Nitrate of soda better than cotton seed meal by..	156 lbs.

Experiments in Bibb and Chilton Counties.

			BRENT			THORSBY		
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	976	72	0.17	456	48	-0.89
2	240	Acid phosphate	1016	112	3.25	584	176	6.06
3	000	No fertilizer	904			408		
4	200	Kainit	856	000	-1.40	368	-14	-2.02
5	200	C. S. Meal	1056	248	6.23	496	139	1.44
	240	Acid phosphate						
6	200	C. S. Meal	952	192	4.05	520	189	3.92
	200	Kainit						
7	000	No fertilizer	712			306		
8	240	Acid phosphate	880	132	2.73	590	262	8.45
	200	Kainit						
9	200	C. S. Meal	1120	336	8.70	688	339	8.84
	240	Acid phosphate						
10	200	Kainit	1136	316	8.52	720	349	9.98
	240	Acid phosphate						
11	000	No fertilizer	856			392		
12	240	Acid phosphate	1328	472	15.39	992	600	21.02
	100	Kainit						
	100	Nitrate of soda						

CHILTON COUNTY, 2½ MILES SOUTH OF THORSBY.

R. M. FOSHEE.

Gray sandy loam, with yellow clay subsoil.

This land had been in cultivation about 15 years. Long leaf pine with some oak was the original growth. The preceding crop was corn. The stand was not perfect.

The largest increase in yield, 600 pounds per acre, and the largest net profit, was afforded by Plot 12, which received per acre

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

This plot afforded a profit due to fertilizers of \$21.02

per acre, or 390 per cent on the investment in fertilizer.

The average increase attributable to cotton seed meal was 73 pounds of seed cotton per acre; to acid phosphate, 173 pounds; and to kainit, 103 pounds. Evidently a complete fertilizer was needed on this soil, and one containing only 100 pounds of kainit was fully as good as one with double this amount of potash.

Nitrate of soda at the rate of 100 pounds per acre applied June 18 to cotton planted April 24, was more effective than double this amount of cotton seed meal applied just before planting.

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

To unfertilized plot.....	48 lbs.
To acid phosphate plot.....	—37 lbs.
To kainit plot.....	203 lbs.
To acid phosphate and kainit plot.....	77 lbs.

Average increase with cotton seed meal 73 lbs.

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

To unfertilized plot.....	176 lbs.
To cotton seed meal plot.....	91 lbs.
To kainit plot.....	276 lbs.
To cotton seed meal and kainit plot.....	150 lbs.

Average increase with acid phosphate 173 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	—14 lbs.
To cotton seed meal plot.....	141 lbs.
To acid phosphate plot.....	86 lbs.
To cotton seed meal and acid phosphate plot....	200 lbs.

Average increase with kainit 103 lbs.

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

From use of 200 pounds kainit.....	200 lbs.
From use of 100 pounds kainit.....	210 lbs.

Increase from use of cotton seed meal in complete fertilizer 77 lbs.

Increase from use of nitrate of soda..... 328 lbs.

Nitrate of soda better than cotton seed meal by.. 252 lbs.

CHAMBERS, 1 MILE NORTHEAST OF LAFAYETTE.

A. A. TATUM.

Gray gravelly loam, with yellowish subsoil.

The stand was even and no reason is known for the failure of phosphate and nitrogen to afford somewhat uniform increases in yield, except perhaps on account of the abnormal season.

Kainit was apparently effective except when applied alone. In a complete fertilizer 100 pounds of kainit was more helpful than 200 pounds.

The average increase in seed cotton per acre attributable to cotton seed meal was only 9 pounds; to acid phosphate, 57 pounds; and to kainit, 53 pounds.

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

To unfertilized plot.....	—32 lbs.
To acid phosphate plot.....	8 lbs.
To kainit plot.....	136 lbs.
To acid phosphate and kainit plot.....	—76 lbs.

Average increase with cotton seed meal..... 9 lbs.

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

To unfertilized plot.....	000 lbs.
To cotton seed meal plot.....	40 lbs.
To kainit plot.....	200 lbs.
To cotton seed meal and kainit plot.....	—12 lbs.

Average increase with acid phosphate..... 57 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	—68 lbs.
To cotton seed meal plot.....	100 lbs.
To acid phosphate plot.....	132 lbs.
To cotton seed meal and acid phosphate plot....	48 lbs.

Average increase with kainit..... 53 lbs.

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.....	164 lbs.

Experiments in Chambers and St. Clair Counties.

			LAFAYETTE			SPRINGVILLE		
Plot No.	Amt. fertilizer per acre.	KIND OF FERTILIZER	Yield seed cot-	Increase over	Profit from	Yield seed cot-	Increase over	Profit from
			ton per acre	unfertilized plot		ton per acre	unfertilized plot	
	Lbs.		Lbs	Lbs.		Lbs.	Lbs.	
1	200	Cotton seed meal	800	—32	\$—4.41	704	168	\$ 4.39
2	240	Acid phosphate	832	00	—1.68	736	200	7.12
3	000	No fertilizer	832			536		
4	200	Kainit	752	—68	—4.39	608	70	1.68
5	200	C. S. Meal	816	8	—4.33	664	124	0.78
	240	Acid phosphate						
6	200	C. S. Meal	864	68	—1.41	608	66	—1.50
	200	Kainit						
7	000	No fertilizer	784			544		
8	240	Acid phosphate	896	132	2.73	680	156	3.78
	200	Kainit						
9	200	C. S. Meal	800	56	—3.62	760	256	5.18
	240	Acid phosphate						
10	200	Kainit	896	172	2.19	736	252	5.71
	240	Acid phosphate						
11	100	Kainit	704			464		
	000	No fertilizer						
12	240	Acid phosphate	848	144	0.96	712	248	5.53
	100	Kainit						
	100	Nitrate of soda						

ST. CLAIR COUNTY, 1 MILE SOUTH OF
SPRINGVILLE.

J. P. BURKS

Reddish sandy loam, with red clay subsoil.

This land had been long in cultivation. The recent crops had been cotton.

The largest increases in yield (and the largest profit) were made on the three Plots, (10, 12, and 9), receiving complete fertilizers, but with slightly different formula. This soil evidently required a complete fertilizer though in some combinations each fertilizer constituent failed to give an increase.

The average increase due to acid phosphate was 108 pounds of seed cotton per acre; to cotton seed meal, 67

pounds; and to kainit only 14 pounds, on the average, though in the complete fertilizer kainit at both rates was much more effective than is indicated by this figure.

One hundred pounds of kainit per acre was practically as effective as 200 pounds.

Cotton seed meal before planting was very slightly better than nitrate of soda applied July 4.

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

To unfertilized plot.....	168 lbs.
To acid phosphate plot.....	—76 lbs.
To kainit plot.....	—4 lbs.
To acid phosphate and kainit plot.....	100 lbs.

Average increase with cotton seed meal 67 lbs.

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

To unfertilized plot.....	200 lbs.
To cotton seed meal plot.....	—44 lbs.
To kainit plot.....	86 lbs.
To cotton seed meal and kainit plot.....	190 lbs.

Average increase with acid phosphate 108 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.....	—44 lbs.
To cotton seed meal and acid phosphate plot.....	132 lbs.

Average increase with kainit 14 lbs.

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

From use of 200 pounds kainit.....	132 lbs.
From use of 100 pounds kainit.....	128 lbs.

Increase from use of cotton seed meal in complete fertilizer 100 lbs.

Increase from use of nitrate of soda..... 96 lbs.

Cotton seed meal better by..... 4 lbs.

PICKENS COUNTY. 3 MILES NORTHWEST OF ALICEVILLE.

G. C. TURNIPSEED

Red sandy loam, with red clay subsoil.

The stand was uniform. The largest increase was made on Plot 10, reciving a complete fertilizer containing a half ration of kainit. This was closely followed

in amount of increase and in profit per acre by Plot 5, which was fertilized with

200 pounds cotton seed meal per acre,
240 pounds acid phosphate per acre.

This plot afforded a net profit above the cost of fertilizer of \$11.36 per acre, which is equal to a profit of 264 percent on the investment in fertilizer.

The average increase attributable to cotton seed meal used under four different conditions was 100 pounds of seed cotton per acre; the average increase due to acid phosphate was 260 pounds of seed cotton per acre.

In an average of four conditions kainit afforded no increase in yield though it was slightly helpful in each of the complete fertilizers.

Apparently this land needed both cotton seed meal and acid phosphate, but no kainit, under the conditions of 1913.

Cotton seed meal, applied before planting, was more effective than half its weight of nitrate of soda, applied late.

Experiment in Pickens County.

			ALICEVILLE		
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	640	160	4.04
2	240	Acid phosphate	760	280	10.64
3	000	No fertilizer	480		
4	200	Kainit	520	40	0.36
5	200	C. S. Meal	840	360	11.36
	240	Acid phosphate ..			
6	200	C. S. Meal	560	80	-0.88
	200	Kainit			
7	000	No fertilizer	480		
8	240	Acid phosphate ..	760	274	8.98
	200	Kainit			
9	200	C. S. Meal	880	388	10.99
	240	Acid phosphate ..			
	200	Kainit			
10	200	C. S. Meal	880	382	11.43
	240	Acid phosphate ..			
11	100	Kainit	504		
	000	No fertilizer			
12	240	Acid phosphate ..	840	336	9.90
	100	Kainit			
	100	Nitrate of soda ..			

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

To unfertilized plot.....	160 lbs.
To acid phosphate plot.....	80 lbs.
To kainit plot.....	40 lbs.
To acid phosphate and kainit plot	120 lbs.

Average increase with cotton seed meal ----- 100 lbs.

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

To unfertilized plot.....	280 lbs.
To cotton seed meal plot.....	200 lbs.
To kainit plot	240 lbs.
To cotton seed meal and kainit plot.....	320 lbs.

Average increase with acid phosphate ----- 260 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	40 lbs.
To cotton seed meal plot.....	—80 lbs.
To acid phosphate plot.....	0 lbs.
To cotton seed meal and acid phosphate plot....	40 lbs.

Average increase with kainit ----- 0 lbs.

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

From use of 200 pounds kainit.....	40 lbs.
From use of 100 pounds kainit.....	40 lbs.

Increase from use of cotton seed meal in a complete

fertilizer

120 lbs.

Increase from use of nitrate of soda.....

80 lbs.

Cotton seed meal better than nitrate of soda

40 lbs.

Inconclusive Experiments in Madison, DeKalb, Etowah, Blount, Lamar, and Fayette Counties.

		HUNTSVILLE		COLLINSVILLE		GADSDEN		ONEONTA		MILLPORT		FAYETTE		
Plot No.	Amt. fertilizer per acre.	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Yield seed cotton per acre	Increase over unfertilized plot	Yield seed cotton per acre	Increase over unfertilized plot	Yield seed cotton per acre	Increase over unfertilized plot	Yield seed cotton per acre	Increase over unfertilized plot	Yield seed cotton per acre	Increase over unfertilized plot
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	200	Cotton seed meal	456	-112	928	16	744	104	504	56	744	32	608	00
2	240	Acid phosphate	552	-16	1008	96	792	152	648	200	812	100	720	112
3	000	No fertilizer	568		912		640		448		712		608	
4	200	Kainit	652	62	1008	156	848	236	480	-44	936	266	848	192
5	200	C. S. Meal	772	160	1120	328	696	112	656	56	776	148	739	35
	240	Acid phosphate												
6	200	C. S. Meal	776	142	1104	372	776	220	560	-116	808	222	768	16
	200	Kainit												
7	000	No fertilizer	656		672		528		752		544		800	
8	240	Acid phosphate	728	128	1184	432	696	152	784	142	848	280	816	-40
	200	Kainit												
9	200	C. S. Meal	680	136	1216	384	768	208	688	155	896	304	1504	592
	240	Acid phosphate												
10	200	C. S. Meal	624	136	1344	432	904	328	720	297	928	312	960	-8
	100	Kainit												
11	000	No fertilizer	432		992		592		313		640		1024	
12	200	Acid phosphate	496	64	1328	336	640	48	752	439	976	336	1136	112
	100	Kainit												
	100	Nitrate of soda												

INCONCLUSIVE EXPERIMENTS.

In MADISON COUNTY, 4 miles northwest of Huntsville, C. E. Hoy made an experiment on typical Tennessee Valley upland. The results were inconclusive, probably on account of the extremely dry season. (See page 44).

In DEKALB COUNTY, 3 miles south of Collinsville, T. A. Ventrees made an experiment on gray, gravelly valley soil, with light red subsoil. This proved inconclusive because of wide differences in fertility between the three unfertilized plots. However, the results strongly suggest that potash was especially helpful, and suggest also that nitrogen and phosphate were also helpful. (See page 44).

In ETOWAH COUNTY, an experiment conducted by D. C. Able, 7 miles east of Gadsden, proved inconclusive because of a poor stand, caused by a hailstorm on June 13th. (See page 44).

In BLOUNT COUNTY, 1½ miles south of Oneonta, R. R. Harris conducted an experiment on gray, gravelly valley soil, with red clay subsoil. This was rendered inconclusive by wide differences in the yields of the three unfertilized. However, the results suggest a very strong response of this soil to acid phosphate. (See page 44).

In LAMAR COUNTY, 1 mile east of Millport, P. H. Vail conducted an experiment on light brown loam with yellowish, sandy subsoil. This soil mapped by the U. S. Bureau of Soils as Norfolk loam. The experiment was satisfactory except that cotton wilt made the stand so irregular that results were not entirely conclusive. (See page 44). However, the results strongly suggest that in this extremely dry season kainit was the fertilizer constituent chiefly needed, but that both nitrogen and phosphate were likewise helpful. Apparently a complete fertilizer is advisable on this soil.

In FAYETTE COUNTY, J. Q. Bradley conducted an experiment on gray loam soil, with some gravel and yellow clay subsoil. The results are inconclusive on account of wide differences in the yields of the three unfertilized plots and to the lack of rain throughout most of the summer. (See page 44).

In TUSCALOOSA COUNTY, 3½ miles northwest of Northport, Smith Bros. conducted an experiment on red, fine sandy upland, with red clay subsoil. A hailstorm in September made results inconclusive. In spite of the fact that cowpeas grew between the rows of the corn that preceded the cotton, yet nitrogen seems to have been the most effective fertilizer constituent for cotton. (See page 47).

In COOSA COUNTY, 8 miles southwest of Goodwater, J. S. Calloway conducted an experiment on reddish loam, with stiffer red subsoil. This proved inconclusive because of want of uniformity between the several unfertilized plots. However, results suggest that both nitrogen and phosphate were highly effective and that kainit was of much less value. (See page 47).

In RANDOLPH COUNTY, 1½ miles southwest of Roanoke, W. O. Longshore conducted an experiment. This proved inconclusive, probably on account of differences in the nature of the soil of the different plots. (See page 47).

In MARION COUNTY, 6 miles northeast of Glen Allen, Mr. W. P. Letson conducted an experiment on dark, sandy loam, with red clay subsoil. The experiment proved inconclusive, because Plot 1, seemed more fertile than any other, both in 1911 and 1913.

This field had been in cultivation about 35 years. The original growth was oak and hickory. For the last six years oats followed by cowpeas had occupied the land every alternate year. In spite of the cowpea stubble cotton seed meal proved very effective in 1911 and 1913. The stand was uniform. No disease was present. The summer was extremely dry, which probably accounts, in part, for the unusual results. Apparently nitrogen was the main need of this field, and phosphate was of strictly secondary importance. Kainit was useless in both years when the experiment was made on the same plots.

In the words of Mr. Letson, and according to his observation, "All plots where potash was used, lost more squares by shedding than other plots."

In MADISON COUNTY, W. H. Johnston conducted an experiment on typical Tennessee Valley red upland soil. This proved inconclusive because of irregularities in the stand of the different plots. Below is given a table which shows the actual yields, and the yields when corrected to an equal number—5000—plants per acre.

This table suggests that when the yields and increases are calculated to uniform stands, cotton on this soil responds very freely to both cotton seed meal and acid phosphate in all combinations; and that kainit was much less important though apparently somewhat helpful when used in a *complete* fertilizer.

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bama in 1913.
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bama in 1913.
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Auburn, Ala.
Press Bulletin No. 67: Oat Smut.
Press Bulletin No. 68: Tests of Varieties of Corn in 1913.
Press Bulletin No. 69: Cotton Boll Weevil Infested Area in United States
and Quarantine Line in Alabama, 1913 and 1914.
Press Bulletin No. 70: Tests of Varieties of Cotton in 1913.