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AUBURN

**Local Fertilizer Experiments With Cotton
in South Alabama, 1914-1918, Inclusive.**

By

J. T. WILLIAMSON

and

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1918

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LOCAL FERTILIZER EXPERIMENTS
WITH COTTON IN SOUTH
ALABAMA, 1914-1918,
INCLUSIVE

By

J. T. WILLIAMSON

and

J. F. DUGGAR

SUMMARY

This bulletin records the results of fertilizer experiments with cotton conducted by the Local Experiment Division of the Alabama Experiment Station in the counties of the southern half of Alabama from 1914 to 1918, inclusive.

A comparison of cotton seed meal and acid phosphate shows that the average increase attributable to cotton seed meal was greater than the average increase due to acid phosphate on 68 per cent of the 44 conclusive experiments on Coastal Plain soils; equal to acid phosphate on 16 per cent; and less than the average increase due to acid phosphate on 16 per cent.

Cotton seed meal gave an average increase greater than did kainit on 73 per cent of the experiments. It was about equal to kainit on 7 per cent, and less than kainit on 20 per cent of the experiments.

In 52 per cent of the tests acid phosphate made an average increase greater than the average increase due to kainit. It was equal to kainit on 14 per cent, and less than kainit on 34 per cent.

An average of the results obtained from the 44 conclusive experiments mentioned above shows that when cotton seed meal is taken as a basis the relative increases in crop due to 200 pounds cotton seed meal, 240 pounds acid phosphate or 200 pounds kainit* is as 100 to 45 to 34, respectively. However, an average of a much greater number of experiments covering a period from 1911 through 1918 shows potash as of much more importance, and acid phosphate slightly more important than here indicated.

One hundred pounds of kainit per acre when applied in a complete fertilizer was nearly as effective, and, on

the average more profitable, than, was two hundred pounds.

The average of these 44 conclusive experiments shows that 100 pounds of nitrate of soda applied when the plants were six to eight inches tall to make a complete fertilizer was slightly more effective than was an application of 200 pounds of cotton seed meal applied in a complete fertilizer before planting.

The largest average increase and largest average profit secured on these 44 tests came from a per acre application of the following fertilizers:

240 pounds acid phosphate } before planting.
 100 pounds kainit }
 100 pounds nitrate of soda, when plants were 6 to 8 inches tall.

Average Yield and Average Increase on 44 Experiments Made on Coastal Plain Soils in South Alabama

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton	Increase over
			per acre	unfertilized plot
	Lbs.		Lbs.	Lbs.
1	200	Cotton seed meal	632	140
2	240	Acid phosphate	566	73
3		No fertilizer	491	
4	200	Kainit*	553	58
5	200	Cotton seed meal	686	189
	240	Acid phosphate		
6	200	Cotton seed meal	673	173
	200	Kainit*		
7		No fertilizer	503	
8	240	Acid phosphate	621	111
	200	Kainit*		
9	200	Cotton seed meal	729	224
	240	Acid phosphate		
	200	Kainit*		
10	200	Cotton seed meal	727	221
	240	Acid phosphate		
	100	Kainit*		
11		No fertilizer	506	
12	240	Acid phosphate	739	233
	100	Kainit*		
	100	Nitrate of soda		

*Due to scarcity of kainit, equivalent amounts of other potash fertilizers used instead of kainit in some years.

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 southern 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 with fertilizer experiments carried to a conclusion in 1914-15-16-17-18 in the southern half of the State. For convenience the counties grouped together in this bulletin are those lying within or wholly south of the Central Prairie or Lime Region.

The results of fertilizer experiments made in the counties lying north of the Central Prairie Region will appear in a later bulletin of this Station.

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.

In order to meet these conditions it was often necessary to select *very old, "run-down" cotton land on which no effort for improvement had been made.* 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 8 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 experiments with corn are detailed in bulletins 181 and 182 on exactly the same plan as the fertilizer experiments with cotton.

FIELD EXPERIMENTS REPEATED OFTEN, THE ONLY MEANS
OF DETERMINING WHAT FERTILIZERS A GIVEN
TYPE OF SOIL REQUIRES.

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:

	1914	1915	1916	1917	1918	Av. 1911-1918
January -----	2.26	7.07	3.37	5.96	6.48	
February -----	4.72	5.28	4.23	5.13	2.27	
March -----	2.85	3.29	3.19	7.81	0.90	
April -----	3.11	0.50	3.32	2.90	8.11	
May -----	0.85	6.79	4.16	1.86	2.28	3.38
June -----	2.45	4.26	3.09	2.36	3.92	3.57
July -----	3.89	4.92	17.23	6.24	3.76	4.96*
August -----	6.76	4.33	4.26	6.39	5.25	5.05
September -----	6.02	4.40	2.27	8.16	4.13	
October -----	2.71	5.10	1.89	1.14	8.41	
November -----	4.99	2.27	2.95	1.25	5.73	
December -----	4.39	5.73	4.35	2.01	7.04	

Total 12 months ----- 45.00 53.94 54.31 51.21 58.28

*Exclusive of 1916 rainfall. Including 1916 rainfall for July was 6.50 inches.

The total rainfall for the months of May, June, July and August is probably the most important climatic factor in determining the yield of cotton under boll weevil conditions. For this reason it is interesting to compare the monthly rainfall with the average rainfall in Alabama for these months during the last eight years.

In consideration of seasonal rainfall it should be remembered that the total rainfall for a given month or even for the growing season, may give misleading information, in that the actual distribution of the rainfall is not taken into account. For example, July 1918 at Auburn would probably be classed as a very dry month, but the total rainfall for that month was 4.63 inches, as compared with a seven year's average of 4.96 inches for the whole of south Alabama, but 3.96 inches of the July rainfall at Auburn fell between July 24 and 28, inclusive, leaving .67 of an inch as the rainfall for the remaining 26 days of the month.

LOCATION OF EXPERIMENTS

<i>County</i>	<i>Post Office</i>	<i>Name</i>	<i>Page</i>
Autauga	Autaugaville	W. G. Pickett	175
Autauga	Prattville	W. A. Wadsworth	177
Bairbour	Eufaula	L. B. Green	224
Bullock	Union Springs	S. P. Rainer, Jr.	237
Butler	Georgiana	J. T. Porter	210
Butler	Greenville	E. L. Graydon	204-206
Butler	Greenville	W. C. Walton	208
Choctaw	Lisman	J. L. Covington	235
Clarke	Grove Hill	J. Winters Calhoun	191-193
Clarke	Thomasville	R. L. Hearron	190
Coffee	Elba	T. P. Windham	237
Conecuh	Evergreen	W. F. Chandler	216
Conecuh	Herbert	G. M. Harper	211-214
Crenshaw	Brantley	A. C. Causey	220-222
Crenshaw	Luverne	F. L. Hawkins	237
Dale	Ozark	J. W. Byrd	227
Dale	Ozark	A. L. Carr	225
Dallas	Selma	W. J. Templin	173-174
Dallas	Cahaba	C. Kirkpatrick	235
Elmore	Eclectic	H. D. Templeton	178-180
Elmore	Eclectic	O. C. Johnson	237
Escambia	Nokomis	N. B. Rhodes	218
Escambia	Brewton	J. E. Tippen	237
Geneva	Hartford	Geneva Co. High School	237
Greene	Eutaw	J. A. Dees	235
Greene	Eutaw	W. H. Myers	239
Hale	Akron	J. R. Holbrook	170
Hale	Newbern	B. L. Allen	239
Henry	Abbeville	J. B. Espy	237
Henry	Headland	M. A. Creel	228
Henry	Headland	C. F. Wilkerson	231
Houston	Headland	D. C. Jarvis	230
Lowndes	Letohatchie	J. B. Mitchell, Jr.	166
Macon	Tuskegee	W. C. Hardwick	182
Macon	Notasulga	W. J. Bridges	184
Marngo	Thomaston	L. O. Crocker	162
Marengo	Thomaston	J. S. Phillips	239
Monroe	Monroeville	J. R. Carter	185-186
Monroe	Monroeville	J. L. Holloway	188
Montgomery	Montgomery	O. C. McGehee	167-169
Montgomery	Montgomery	W. M. Claxton	165
Perry	Hamburg	J. H. Lee	164
Perry	Marion	R. H. Woodfin	172
Pike	Troy	H. W. & T. V. Ballard	222
Pike	Troy	T. H. Curtis	237
Sumter	Cuba	W. H. Stephens	235
Washington	Leroy	W. F. Melton	195
Washington	Leroy	R. G. Pearson	239
Wilcox	Camden	G. M. Cook	197
Wilcox	Catherine	J. A. McGee	239
Wilcox	McWilliams	R. F. Chappell	198-203

Experiments were begun in the counties named below, but for reasons satisfactorily explained at the time they were not carried to a conclusion.

County	Post Office	Name	Year
Autauga	Prattville	P. H. Graham	1914
Autauga	Prattville	W. A. Wadsworth	1915
Barbour	Comer	Mitchell Bros. and Wright	1914
Barbour	Comer	Mitchell Bros. and Wright	1915
Barbour	Eufaula	L. B. Greene	1914
Bullock	Three Notch	A. B. Shehee	1914
Bullock	Union Springs	A. H. Feagin	1914
Clarke	Thomasville	R. L. Hearron	1914
Coffee	Enterprise	T. T. Brooks	1914
Coffee	Elba	T. P. Windham	1914
Coffee	Elba	T. P. Windham	1915
Covington	Opp	W. G. Chambless	1914
Covington	Andalusia	W. N. Rushton	1914
Covington	Andalusia	W. N. Rushton	1915
Dale	Ozark	N. A. Creel	1916
Elmore	Eclectic	O. C. Johnston	1914
Escambia	Brewton	J. E. Tippin	1914
Escambia	Nokomis	N. B. Rhodes	1915
Geneva	Hartford	J. C. Blaylock	1914
Geneva	Hartford	S. G. Burch	1917
Hale	Greensboro	A. S. Douglas	1915
Houston	Dothan	W. R. Pittman	1914
Lowndes	Burkville	J. H. Chestnut	1914
Lowndes	Lowdensboro	C. E. Reese	1915
Macon	Tuskegee	J. M. Roberts	1915
Macon	Tuskegee	J. M. Roberts	1916
Marengo	Demopolis	B. C. Brown	1914
Marengo	Demopolis	T. R. Walton	1914
Marengo	Linden	J. T. Scogin	1914
Monroe	Monroeville	B. F. McArthur	1916
Perry	Hamburg	J. H. Lee	1916
Pike	Pronto	W. E. Buntin	1914
Pike	Troy	C. F. Copeland	1915
Pike	Troy	G. A. Ledbetter	1916
Russell	Scale	E. V. Kelly	1914
Russell	Cottonton	W. G. Martin	1915
Sumter	Cuba	R. L. Stephens	1916
Sumter	Cuba	W. H. Stephens	1914
Sumter	Geiger	E. A. Gilbert	1914
Sumter	Geiger	A. J. Payne	1914
Sumter	Geiger	A. J. Payne	1915
Washington	Leroy	W. F. Melton	1916
Wilcox	Camden	G. M. Cook	1914

THE FERTILIZERS USED

The prices given below are used as representing about the average cash prices of fertilizers in local markets for the years 1914, 1915, 1916, 1917 and 1918:

Fertilizer	1914	1915	1916	1917	1918
Cotton seed meal	30.00	30.00	35.00	50.00	55.00
Nitrate of soda	60.00	60.00	75.00	80.00	100.00
Acid phosphate	14.00	14.00	17.50	18.00	21.00
Kainit (12.5% K ₂ O)	14.00	22.60	140.00	140.00	
Alkali Salts (22% K ₂ O) ----					121.00

Prices naturally varied in different localities. In fact, during the past few years some of these fertilizers were not on the local markets, one of which was kainit in 1916, 1917 and 1918.

Anyone caring to do so may substitute the price of fertilizer in his locality for the price 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 prices assumed for seed, for lint, the cost of ginning and picking, and the value of the increase in seed cotton are given below.

Year	Value of seed per ton	Value of lint per pound	Cost of ginning and picking of each pound of seed cotton	Value of the increase in seed cotton, per pound.
1914	\$ 16.00	Cents 6.8	Cents 0.6	Cents 2.2
1915	30.00	12.0	0.6	4.4
1916	50.00	20.0	0.6	7.7
1917	67.50	28.0	0.6	11.0
1918	68.00	30.0	1.3	11.0

*For the standard method employed in this bulletin for calculating the increased yields, see Alabama Station Bulletin No. 160 or 162.

In calculating the value of the increase, take for instance, prices in 1918. The price assumed is \$68.00 per ton for seed and 30 cents per pound for lint. This is equal to 12.3 cents per pound for seed cotton, turning out 33 1-3 per cent lint. Deducting 1.3 cents per pound for picking and ginning, we have 11 cents as the net value per pound of the increase in seed cotton due to fertilizers.

COMPOSITION OF FERTILIZERS

The composition of 100 pounds of each mixture used on the different plots in all years is tabulated below:

Plot

1.	6.79 lbs. nitrogen;	2.88 lbs.* phos. acid;	1.77 lbs. potash.
2.	-----;	16.00 lbs. phos. acid;	-----
4.	-----;	-----	12.30 lbs. potash.
5.	3.09 lbs. nitrogen;	10.04 lbs. phos. acid;	0.80 lbs. potash.
6.	3.39 lbs. nitrogen;	1.44 lbs. phos. acid;	7.03 lbs. potash.
8.	-----;	8.73 lbs. phos. acid;	5.59 lbs. potash.
9.	2.12 lbs. nitrogen;	6.90 lbs. phos. acid;	4.40 lbs. potash.
10.	2.59 lbs. nitrogen;	8.18 lbs. phos. acid;	2.93 lbs. potash.
12.	3.18 lbs. nitrogen;	8.73 lbs. phos. acid;	2.80 lbs. potash.

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

Exceptions to the above should be noted as follows:— Cottonseed meal containing $7\frac{1}{2}$ and 7 per cent ammonia was used in 1916 and in 1918, respectively. Also, in 1918, alkali salts which was supposed to be equivalent to 200 pounds of kainit did not come up to the claimed analysis of 22 per cent.

Those who are more accustomed to the word ammonia than to the term nitrogen, may change the figures for nitrogen into their ammonia equivalents by multiplying by $1\frac{3}{14}$.

MARENGO COUNTY, 6 MILES SOUTH OF
THOMASTON.

L. O. CROCKER—1918.

Typical "post-oak" soil, with stiff subsoil.

The land on which this experiment was located had been in cultivation about five years. Oak and short-leaf pine trees originally grew here. This experiment had to be planted a second time, the last planting being made on May 12. Boll weevils are reported to have cut the yield to a considerable extent. In 1917, the land was planted to cotton; and in 1916, corn was grown on this soil.

The largest profit, \$14.40 per acre, was made on Plot 2, which was fertilized with 240 pounds acid phosphate alone. However, the largest increase, 228 pounds of seed cotton per acre, was made on Plot 9, where a complete fertilizer containing 200 pounds cottonseed meal, 240 pounds acid phosphate and 120 pounds alkali salts (equivalent to 200 pounds kainit) was used.

The average increase due to 200 pounds cottonseed meal per acre was 60 pounds seed cotton per acre; to 240 pounds acid phosphate, 113 pounds; and to 120 pounds alkali salts (equivalent to 200 pounds kainit), 33 pounds seed cotton per acre.

Cottonseed meal, applied before planting, was more effective by 146 pounds seed cotton per acre than was an equivalent amount of nitrate of soda, applied late (July 6).

It is especially noticeable that acid phosphate increased the yields of this soil much more than did either cottonseed meal or alkali salts. The experiment was planted late, and it may be that the increase due to acid phosphate came because of the fact that phosphate usually causes early maturity, in this case causing the plants to set a considerable quantity of fruit before the boll weevil attack which is reported to have come early in August. In other years it is very probable that either nitrogen or potash, or both, will produce much larger increases than they did this season.

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

To unfertilized plot	64 lbs.
To acid phosphate plot	0 lbs.
To kainit plot	72 lbs.
To acid phosphate and kainit plot	102 lbs.
Average increase with cottonseed meal	60 lbs.

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

To unfertilized plot	152 lbs.
To cottonseed meal plot	88 lbs.
To kainit plot	90 lbs.
To cottonseed meal and kainit plot	120 lbs.
Average increase with acid phosphate	113 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	36 lbs.
To cottonseed meal plot	44 lbs.
To acid phosphate plot	—26 lbs.
To cottonseed meal and acid phosphate plot	76 lbs.
Average increase with kainit	33 lbs.

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

To use of 200 pounds kainit	76 lbs.
To use of 100 pounds kainit	66 lbs.

Increase from use of cottonseed meal in complete fertilizer

Cottonseed meal better than nitrate of soda by ..	102 lbs.
	146 lbs.

Experiments in Marengo and Perry Counties

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	THOMASTON* 1918			HAMBURG 1915		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal ..	280	64	1.54	304	—200	—11.80
2	240	Acid phosphate	368	152	14.40	456	—48	—3.79
3		No fertilizer	216			504		
4	200	Kainit	264	36	—3.30	544	16	—1.56
5	200	Cotton seed meal } ..	392	152	8.70	600	48	—2.57
	240	Acid phosphate ..						
6	200	Cotton seed meal } ..	360	108	—0.88	696	120	0.02
	200	Kainit						
7		No fertilizer	264			600		
8	240	Acid phosphate	368	126	4.08	480	—86	—7.72
	200	Kainit						
9	200	Cotton seed meal } ..	448	228	9.80	608	76	—3.60
	240	Acid phosphate ..						
	200	Kainit						
10	200	Cotton seed meal } ..	416	218	12.33	680	182	2.20
	240	Acid phosphate ..						
	100	Kainit						
11		No fertilizer	176			464		
12	240	Acid phosphate	248	72	—3.23	568	104	—1.23
	100	Kainit						
	100	Nitrate of soda ..						

*120 pounds alkali salts used instead of 200 pounds kainit as source of potash in 1918.

PERRY COUNTY, 1 MILE WEST OF HAMBURG.

J. H. LEE—1915.

Black prairie lowland.

This experiment was made on rich black prairie lowland which had been in cotton for the preceding three years, or longer. Boll weevils did considerable damage to the test, although no report is made of their having damaged any one plot more than they did any other plot.

No fertilizer or combination of fertilizers was highly profitable on this soil in 1915, probably due to the excessive damage by weevils. Plot 10, receiving 200 pounds cottonseed meal, 240 pounds acid phosphate and 100 pounds kainit per acre, made an increase of 182 pounds seed cotton per acre, and a profit of \$2.20.

The average increase due to cottonseed meal was 41 pounds seed cotton per acre; to acid phosphate, only 16 pounds; while kainit at the rate of 200 pounds per acre produced an increase of 82 pounds seed cotton per acre.

Cottonseed meal was more effective by 78 pounds seed cotton per acre when applied before planting in a complete fertilizer than was nitrate of soda applied June 8.

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

To unfertilized plot	—200 lbs.
To acid phosphate plot	96 lbs.
To kainit plot	104 lbs.
To acid phosphate and kainit plot	162 lbs.
Average increase with cottonseed meal	41 lbs.

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

To unfertilized plot	—48 lbs.
To cottonseed meal plot	248 lbs.
To kainit plot	—102 lbs.
To cottonseed meal and kainit plot	—44 lbs.
Average increase with acid phosphate	14 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	16 lbs.
To cottonseed meal plot	320 lbs.
To acid phosphate plot	—38 lbs.
To cottonseed meal and acid phosphate plot ..	28 lbs.
Average increase with kainit	82 lbs.

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

To use of 200 pounds kainit	28 lbs.
To use of 100 pounds kainit	134 lbs.
Increase from use of cottonseed meal in complete fertilizer	162 lbs.

Increase from use of nitrate of soda	84 lbs.
Cottonseed meal better than nitrate of soda by ..	78 lbs.

MONTGOMERY COUNTY, 3 MILES SOUTHEAST OF
HOPE HULL.

W. M. CLAXTON ON THE FARM OF ALEX CLARKE—1915.

Gray prairie soil.

The poor prairie land on which this experiment was made was cropped to cotton in 1914.

The largest profit, \$12.52 per acre, was secured on Plot 6, fertilized with a mixture of 200 pounds cottonseed meal and 200 pounds kainit. This plot also made the largest increase in seed cotton per acre, although it was closely followed by Plot 9, fertilized per acre with

200 pounds cottonseed meal
240 pounds acid phosphate
200 pounds kainit.

The second largest profit, \$12.25 per acre, was secured on Plot 8, which received a mixture containing acid phosphate and kainit at the rates of 240 pounds and 200 pounds per acre, respectively.

The average increase due to 200 pounds of cottonseed meal on this experiment was 128 pounds seed cotton per acre; to 240 pounds acid phosphate, 60 pounds seed cotton per acre; and to 200 pounds kainit, 242 pounds seed cotton per acre.

Two hundred pounds of kainit was more effective than one-half this quantity by 80 pounds of seed cotton per acre.

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

To unfertilized plot	160 lbs.
To acid phosphate plot	88 lbs.
To kainit plot	232 lbs.
To acid phosphate and kainit plot	32 lbs.
Average increase with cottonseed meal	128 lbs.

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

To unfertilized plot	64 lbs.
To cottonseed meal plot	—8 lbs.
To kainit plot	196 lbs.
To cottonseed meal and kainit plot	—4 lbs.
Average increase with acid phosphate	62 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	172 lbs.
To cottonseed meal plot	244 lbs.
To acid phosphate plot	304 lbs.
To cottonseed meal and acid phosphate plot ..	248 lbs.
Average increase with kainit	242 lbs.

Increase of seed cotton per acre from use of different quantities of kainit:
 To use of 200 pounds kainit 248 lbs.
 To use of 100 pounds kainit 168 lbs.
 Increase from use of cottonseed meal in complete fertilizer 32 lbs.
 Increase from use of nitrate of soda 80 lbs.
 Nitrate of soda better than cottonseed meal by .. 48 lbs.

Experiments in Montgomery and Lowndes Counties

			HOPE HULL 1915			LETOHATCHIE 1914		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre			Yield seed cotton per acre		
			Yield	Increase over unfertilized plot	Profit from fertilizer	Yield	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal ..	352	160	4.04	1072	368	5.10
2	240	Acid phosphate ..	256	64	1.14	1416	712	13.98
3		No fertilizer ..	192			704		
4	200	Kainit ..	352	172	5.31	1416	672	13.38
5	200	Cotton seed meal }	320	152	2.01	968	184	-0.63
	240	Acid phosphate .. }						
6	200	Cotton seed meal }	560	404	12.52	1104	280	1.76
	200	Kainit ..						
7		No fertilizer ..	144			864		
8	240	Acid phosphate .. }	512	368	12.25	1048	200	1.32
	200	Kainit ..						
9	200	Cotton seed meal }	544	400	10.66	960	128	-3.26
	240	Acid phosphate .. }						
	200	Kainit ..						
10	200	Cotton seed meal }	464	320	8.27	872	56	-4.15
	240	Acid phosphate .. }						
11	100	Kainit ..	144			800		
12	240	Acid phosphate .. }	512	368		896	96	-3.27
	100	Kainit ..						
	100	Nitrate of soda.*)						

*200 pounds nitrate of soda per acre used on experiment at Hope Hull.

LOWNDES COUNTY, 1/2 MILE SOUTHWEST OF LETOHATCHIE.

J. B. MITCHELL, JR.—1914.

Black prairie soil, with stiff gray subsoil.

The land on which this experiment was conducted is a typical black prairie bottomland which originally grew oak and hickory trees. It had been in cultivation for many years. The three crops preceding the ferti-

lizer experiment were cotton. An estimated damage of 15 to 20 per cent was done to all plots by boll weevils.

The results of this experiment were very peculiar. It should be noted that all of the single fertilizers were profitable, but that little or no profit was secured from the application of these fertilizers in combination.

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

To unfertilized plot	368 lbs.
To acid phosphate plot	—528 lbs.
To kainit plot	—392 lbs.
To acid phosphate and kainit plot	—72 lbs.
Average increase with cottonseed meal	—156 lbs.

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

To unfertilized plot	712 lbs.
To cottonseed meal plot	—184 lbs.
To kainit plot	—472 lbs.
To cottonseed meal and kainit plot	—152 lbs.
Average increase with acid phosphate	—24 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	672 lbs.
To cottonseed meal plot	—88 lbs.
To acid phosphate plot	—512 lbs.
To cottonseed meal and acid phosphate plot ..	—56 lbs.
Average increase with kainit	4 lbs.

MONTGOMERY COUNTY, 12 MILES SOUTH OF MONTGOMERY.

O. C. McGEHEE—1914.

Dark gray upland prairie soil.

This experiment, through error, was made on plots which were slightly less than one-eighth acre each in size. Fertilizers which were shipped to Mr. McGehee for the test were for one-eighth acre and were applied to the plots which were under-size, making the per acre rate of application of fertilizers as follows:

216 pounds cottonseed meal
 259 pounds acid phosphate
 216 pounds kainit
 108 pounds nitrate of soda.

In the calculations, allowances are made for the size of plots.

This old prairie upland had been in cultivation many years. Cotton had been the preceding crop for at least three years. The stand on all plots was fair to good.

The largest increase, 443 pounds seed cotton per acre, was obtained from Plot 10, at a profit of \$4.37.

This plot was fertilized per acre with 216 pounds cottonseed meal, 259 pounds acid phosphate and 216 pounds kainit.

The average increase due to cottonseed meal was 72 pounds seed cotton per acre; to acid phosphate, 127 pounds; and to kainit 154 pounds seed cotton per acre.

Cottonseed meal was better than nitrate of soda by 160 pounds seed cotton per acre.

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

To unfertilized plot	18 lbs.
To acid phosphate plot	72 lbs.
To kainit plot	24 lbs.
To acid phosphate and kainit plot	223 lbs.
Average increase with cottonseed meal	72 lbs.

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

To unfertilized plot	65 lbs.
To cottonseed meal plot	119 lbs.
To kainit plot	39 lbs.
To cottonseed meal and kainit plot	286 lbs.
Average increase with acid phosphate	127 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	140 lbs.
To cottonseed meal plot	98 lbs.
To acid phosphate plot	114 lbs.
To cottonseed meal and acid phosphate plot ..	265 lbs.
Average increase with kainit	154 lbs.

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

To use of 216 pounds kainit	265 lbs.
To use of 108 pounds kainit	306 lbs.

Increase from use of cottonseed meal in complete fertilizer	223 lbs.
Increase from use of nitrate of soda	117 lbs.
Cottonseed meal better than nitrate of soda by ..	106 lbs.

Experiments in Montgomery County

			MONTGOMERY 1914			MONTGOMERY 1915		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton	Increase over	Profit from	Yield seed cotton	Increase over	Profit from
			per acre	unfertilized plot	fertilizer	per acre	unfertilized plot	fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	216	Cotton seed meal	566	18	-2.60	181	77	0.15
2	259	Acid phosphate	613	65	0.25	164	60	0.83
3		No fertilizer	548			104		
4	216	Kainit	682	140	1.68	216	103	2.09
5	216	Cotton seed meal	674	137	-1.67	294	173	2.56
	259	Acid phosphate						
6	216	Cotton seed meal	648	116	-1.85	302	172	1.89
	216	Kainit						
7		No fertilizer	527			138		
8	259	Acid phosphate	708	179	0.86	354	205	3.34
	216	Kainit						
9	216	Cotton seed meal	933	402	2.76	371	211	1.79
	259	Acid phosphate						
10	216	Cotton seed meal	976	443	4.37	371	201	2.47
	259	Acid phosphate						
11	108	Kainit	535			181		
		No fertilizer						
12	259	Acid phosphate	872	337	2.03	397	216	3.13
	108	Kainit						
	108	Nitrate of soda						

O. C. McGEHEE—1915.

In 1915, Mr. McGehee made an experiment similar to the one in 1914.

The average increase due to cottonseed meal was 66 pounds seed cotton per acre; to acid phosphate, 74 pounds; and to kainit, 95 pounds seed cotton per acre.

The largest profit, \$3.34 per acre, was obtained on Plot 8, fertilized per acre as follows:

259 pounds acid phosphate,
216 pounds kainit.

The largest increase in seed cotton per acre was obtained on Plot 12, fertilized as follows:

259 pounds acid phosphate
108 pounds kainit
108 pounds nitrate of soda.

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

To unfertilized plot	77 lbs.
To acid phosphate plot	113 lbs.
To kainit plot	69 lbs.
To acid phosphate and kainit plot	6 lbs.
Average increase with cottonseed meal	66 lbs.

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

To unfertilized plot	60 lbs.
To cottonseed meal plot	96 lbs.
To kainit plot	102 lbs.
To cottonseed meal and kainit plot	39 lbs.
Average increase with acid phosphate	74 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	103 lbs.
To cottonseed meal plot	95 lbs.
To acid phosphate plot	145 lbs.
To cottonseed meal and acid phosphate plot ..	38 lbs.
Average increase with kainit	95 lbs.

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

To use of 216 pounds kainit	38 lbs.
To use of 108 pounds kainit	28 lbs.

Increase from use of cottonseed meal in complete fertilizer

6 lbs.	
Increase from use of nitrate of soda	21 lbs.
Nitrate of soda better than cottonseed meal by	15 lbs.

HALE COUNTY, 3 MILES EAST OF AKRON.

J. R. HOLBROOK—1914.

Light reddish, fine sandy soil, with stiffer red subsoil.

This upland soil had been in cultivation for many years. Corn was the preceding crop, and it was preceded by two crops of cotton.

The largest profit secured on this test was made on Plot 12, which produced an increase of 504 pounds seed cotton per acre, at a profit of \$5.71, when 240 pounds acid phosphate, 100 pounds kainit and 100 pounds nitrate of soda were applied per acre. The next largest profit, \$4.91 per acre, was made on Plot 5, receiving per acre 200 pounds cottonseed meal, and 240 pounds acid phosphate, although Plot 9, which received a complete fertilizer containing 200 pounds kainit made a slightly higher increase than did Plot 5.

The average increase due to cottonseed meal was 319 pounds of seed cotton per acre; to kainit, 76 pounds; and to acid phosphate, 46 pounds of seed cotton per acre.

Nitrate of soda applied June 17 was more effective than cottonseed meal by 108 pounds seed cotton per acre.

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

To unfertilized plot	296 lbs.
To acid phosphate plot	412 lbs.
To kairit plot	212 lbs.
To acid phosphate and kainit plot	356 lbs.
Average increase with cottonseed meal	319 lbs.

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

To unfertilized plot	24 lbs.
To cottonseed meal plot	140 lbs.
To kainit plot	62 lbs.
To cottonseed meal and kainit plot	82 lbs.
Average increase with acid phosphate	46 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	154 lbs.
To cottonseed meal plot	70 lbs.
To acid phosphate plot	68 lbs.
To cottonseed meal and acid phosphate plot	12 lbs.
Average increase with kainit	76 lbs.

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

To use of 200 pounds kainit	12 lbs.
To use of 100 pounds kainit	40 lbs.
Increase from use of cottonseed meal	356 lbs.
Increase from use of nitrate of soda	464 lbs.
Nitrate of soda better than cottonseed meal by	108 lbs.

Experiments in Hale and Perry Counties

			AKRON 1914			MARION 1914		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton		Profit from fertilizer	Yield seed cotton		Profit from fertilizer
			per acre	Increase over unfertilized plot		per acre	Increase over unfertilized plot	
1	Lbs 200	Cotton seed meal	Lbs. 824	Lbs. 296	\$ 3.51	Lbs. 800	Lbs. 320	\$ 4.04
2	240	Acid phosphate	552	24	-1.15	720	240	3.60
3		No fertilizer	528			480		
4	200	Kainit	680	154	1.99	560	80	0.36
5	200	Cotton seed meal	960	436	4.91	1040	560	7.64
	240	Acid phosphate						
6	200	Cotton seed meal	888	366	3.65	880	400	4.40
	200	Kainit						
7		No fertilizer	520			480		
8	240	Acid phosphate	616	92	1.06	720	-50	-4.18
	200	Kainit						
9	200	Cotton seed meal	976	448	3.78	1040	580	6.68
	240	Acid phosphate						
	200	Kainit						
10	200	Cotton seed meal	928	396	3.33	1040	590	7.60
	240	Acid phosphate						
	100	Kainit						
11		No fertilizer	536			440		
12	240	Acid phosphate	1040	504	5.71	760	320	1.66
	100	Kainit						
	100	Nitrate of soda						

PERRY COUNTY, 4 MILES SOUTH OF MARION.

R. H. WOODFIN—1914.

Reddish sandy loam, with stiffer reddish subsoil.

This old land on which cotton had been grown for a long period had been cleared of the original forest trees 25 or more years. A good stand was secured on all plots. Boll weevils were present, but did only slight damage.

This soil, which had not been highly fertilized in recent years, needed a complete fertilizer as shown by the fact that Plots 10 and 9 afforded the largest increase in yield, namely, 590 and 580 pounds of seed cotton per acre. However, a profit slightly larger than on the plots receiving complete fertilizer, \$7.60 per acre, was obtained on Plot 5, fertilized with cottonseed meal and acid phosphate.

The average increase in seed cotton per acre attributable to cotton seed meal was 398 pounds; to acid phosphate, 133 pounds; while with kainit there was an average decrease of 3 pounds.

Cotton seed meal applied before planting was decidedly superior to nitrate of soda applied June 19.

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

To unfertilized plot	320 lbs.
To acid phosphate plot	320 lbs.
To kainit plot	320 lbs.
To acid phosphate and kainit plot	630 lbs.
Average increase with cottonseed meal	398 lbs.

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

To unfertilized plot	240 lbs.
To cottonseed meal plot	240 lbs.
To kainit plot	—130 lbs.
To cottonseed meal and kainit plot	180 lbs.
Average increase with acid phosphate	133 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	80 lbs.
To cottonseed meal plot	80 lbs.
To acid phosphate plot	—190 lbs.
To cottonseed meal and acid phosphate plot ..	20 lbs.
Average increase with kainit	—3 lbs.

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

To use of 200 pounds kainit	20 lbs.
To use of 100 pounds kainit	30 lbs.
Increase from use of cottonseed meal	630 lbs.
Increase from use of nitrate of soda in complete fertilizer	360 lbs.
Cottonseed meal better than nitrate of soda by ..	270 lbs.

DALLAS COUNTY, 9 MILES SOUTH OF SELMA.

W. J. TEMPLIN—1914.

Gray sandy soil, with stiffer yellow subsoil.

This experiment was made on upland soil which originally grew short-leaf pine. The land had been cleared a number of years and cropped to corn and cotton most of the recent years.

The largest increase in seed cotton per acre was made on Plot 9, receiving 200 pounds cottonseed meal, 240 pounds acid phosphate and 200 pounds kainit per acre. However, the largest profit, \$4.39 per acre, was made on Plot 1, which was fertilized with cottonseed meal alone at the rate of 200 pounds per acre.

The average increase in seed cotton per acre due to the application of 200 pounds of cottonseed meal was 202 pounds; to 240 pounds acid phosphate, 91 pounds; and to 200 pounds kainit, 27 pounds seed cotton per acre.

Two hundred pounds of kainit was more effective than was 100 pounds per acre when used in a complete fertilizer. Cottonseed meal was more effective than was nitrate of soda by 162 pounds seed cotton per acre.

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

To unfertilized plot	336 lbs.
To acid phosphate plot	64 lbs.
To kainit plot	184 lbs.
To acid phosphate and kainit plot	222 lbs.
Average increase with cottonseed meal	202 lbs.

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

To unfertilized plot	176 lbs.
To cottonseed meal plot	—96 lbs.
To kainit plot	122 lbs.
To cottonseed meal and kainit plot	160 lbs.
Average increase with acid phosphate	91 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	52 lbs.
To cottonseed meal plot	—100 lbs.
To acid phosphate plot	—2 lbs.
To cottonseed meal and acid phosphate plot ..	156 lbs.
Average increase with kainit	27 lbs.

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

To use of 200 pounds kainit	156 lbs.
To use of 100 pounds kainit	122 lbs.

Increase from use of cottonseed meal in complete fertilizer

222 lbs.

Increase from use of nitrate of soda

60 lbs.

Cottonseed meal better than nitrate of soda by 162 lbs.

Experiments in Dallas County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	SELMA 1914			SELMA 1915		
			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	1344	336	4.39	896	344	12.14
2	240	Acid phosphate	1184	176	2.19	696	144	4.66
3		No fertilizer	1008			552		
4	200	Kainit	1120	52	-0.26	592	68	0.73
5	200	Cotton seed meal	1368	240	0.60	856	360	11.16
	240	Acid phosphate						
6	200	Cotton seed meal	1424	236	0.79	696	228	4.77
	200	Kainit						
7		No fertilizer	1248			440		
8	240	Acid phosphate	1384	174	0.75	584	132	1.87
	200	Kainit						
9	200	Cotton seed meal	1568	396	2.63	744	280	5.38
	240	Acid phosphate						
10	200	Cotton seed meal	1496	362	2.58	824	348	9.50
	240	Acid phosphate						
11	100	Kainit	1096			488		
12	240	Acid phosphate	1296	200	-0.98	640	152	0.88
	100	Nitrate of soda						

W. J. TEMPLIN—1915.

In 1915, this experiment was conducted on a similar soil but different plots. The largest profit, \$12.14 per acre, was received from Plot 1, fertilized with 200 pounds cottonseed meal per acre. The largest increase, 360 pounds seed cotton per acre, was obtained where 200 pounds cottonseed meal and 240 pounds acid phosphate were used on Plot 5. This plot produced the second largest profit.

As in 1914, cottonseed meal appeared to be the most important single fertilizer needed on this soil. The average increase due to cottonseed meal when applied at the rate of 200 pounds per acre was 217 pounds seed cotton per acre; to 240 pounds acid phosphate, 69 pounds seed cotton per acre; while with kainit there was an average loss of 35 pounds seed cotton per acre.

Cottonseed meal when applied in a complete fertilizer produced 196 pounds more seed cotton per acre than did nitrate of soda also applied in a complete fertilizer.

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

To unfertilized plot	344 lbs.
To acid phosphate plot	216 lbs.
To kainit plot	160 lbs.
To acid phosphate and kainit plot	148 lbs.
Average increase with cottonseed meal	217 lbs.

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

To unfertilized plot	144 lbs.
To cottonseed meal plot	16 lbs.
To kainit plot	64 lbs.
To cottonseed meal and kainit plot	52 lbs.
Average increase with acid phosphate	69 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	68 lbs.
To cottonseed meal plot	—116 lbs.
To acid phosphate plot	—12 lbs.
To cottonseed meal and acid phosphate plot ..	—80 lbs.
Average increase with kainit	—35 lbs.

AUTAUGA COUNTY, 2½ MILES WEST OF AUTAUGAVILLE.

W. G. PICKETT—1914.

Reddish sandy soil, with stiffer red sandy subsoil.

This land had been long in cultivation. The three preceding crops were cotton. The stand was good on all plots. No damage by disease or insect pests was reported.

The largest increase, 260 pounds of seed cotton, was obtained on Plot 5, fertilized per acre as follows:

200 pounds cottonseed meal
240 pounds acid phosphate.

The average increase due to cotton seed meal was 189 pounds of seed cotton per acre; to acid phosphate, 22 pounds; while with kainit there was an average loss of 68 pounds of seed cotton per acre.

Nitrate of soda applied after growth had begun seemed more effective than did cotton seed meal applied before planting.

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

To unfertilized plot	240 lbs.
To acid phosphate plot	140 lbs.
To kainit plot	140 lbs.
To acid phosphate and kainit plot	236 lbs.
Average increase with cottonseed meal	189 lbs.

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

To unfertilized plot	120 lbs.
To cottonseed meal plot	20 lbs.
To kainit plot	-74 lbs.
To cottonseed meal and kainit plot	22 lbs.
Average increase with acid phosphate	22 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	30 lbs.
To cottonseed meal plot	-70 lbs.
To acid phosphate plot	-164 lbs.
To cottonseed meal and acid phosphate plot	-68 lbs.
Average increase with kainit	-68 lbs.

Increase from use of cottonseed meal in complete fertilizer	236 lbs.
Increase from use of nitrate of soda	288 lbs.
Nitrate of soda better than cottonseed meal by ..	52 lbs.

Experiments in Autauga County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	AUTAUGAVILLE 1914			PRATTVILLE 1914		
			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 ..	720	240	3.28	675	175	0.85
2	240	Acid phosphate	600	120	0.96	500	00	-1.68
3		No fertilizer	480			500		
4	200	Kainit	560	30	-0.74	540	44	-0.43
5	200	Cotton seed meal }	840	260	1.04	840	348	2.98
	240	Acid phosphate ..						
6	200	Cotton seed meal }	800	170	0.66	769	281	1.78
	200	Kainit						
7		No fertilizer	680			485		
8	240	Acid phosphate ..	640	-44	-4.05	716	232	2.02
	200	Kainit						
9	200	Cotton seed meal }	880	192	-1.86	940	457	3.97
	240	Acid phosphate ..						
	200	Kainit						
10	200	Cotton seed meal }	760	68	-3.88	864	382	3.02
	240	Acid phosphate ..						
	100	Kainit						
11		No fertilizer	696			480		
12	240	Acid phosphate ..	816	120	-2.74	920	440	4.30
	100	Kainit						
	100	Nitrate of soda ..						

AUTAUGA COUNTY, 6 MILES SOUTH OF
PRATTVILLE.

W. A. WADSWORTH—1914.

*Gray fine sandy loam, with brownish red very fine
sandy subsoil.*

This lowland field had been in cultivation for many years. The three preceding crops were cotton. The stand was good.

In 1914 this soil needed a complete fertilizer as shown by the largest increases and largest profits being made on Plots 12, 9 and 10.

Nitrogen was first in importance, affording an average increase, in all combinations, of 246 pounds of seed cotton per acre; the increase attributable to acid phosphate was 134 pounds per acre; and to kainit, 123 pounds. (See page 176.)

Nitrate of soda afforded a larger yield than did cotton seed meal by 58 pounds seed cotton per acre.

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

To unfertilized plot	175 lbs.
To acid phosphate plot	348 lbs.
To kainit plot	237 lbs.
To acid phosphate and kainit plot	225 lbs.
Average increase with cottonseed meal	246 lbs.

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

To unfertilized plot	0 lbs.
To cottonseed meal plot	173 lbs.
To kainit plot	188 lbs.
To cottonseed meal and kainit plot	176 lbs.
Average increase with acid phosphate	134 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	44 lbs.
To cottonseed meal plot	106 lbs.
To acid phosphate plot	232 lbs.
To cottonseed meal and acid phosphate plot ..	109 lbs.
Average increase with kainit	123 lbs.

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

To use of 200 pounds kainit	109 lbs.
To use of 100 pounds kainit	34 lbs.

Increase from use of cottonseed meal in complete fertilizer

Increase from use of nitrate of soda

Nitrate of soda better than cottonseed meal by ..

ELMORE COUNTY, 1 MILE EAST OF ECLECTIC.

H. D. TEMPLETON—1914.

Gray sandy loam, with yellow stiffer subsoil.

The land on which this experiment was conducted had been cleared of its original forest growth for about seven years. The preceding crop was corn, which was preceded by two crops of cotton. There was no rust, wilt, or insect damages reported.

The largest increase, 296 pounds seed cotton per acre, was produced on Plot 5, at a profit of \$1.83 per acre. This plot was fertilized with 200 pounds cottonseed meal and 240 pounds acid phosphate. Plot 6, receiving 200 pounds cottonseed meal and 200 pounds kainit produced the second largest increase, which was 244 pounds of seed cotton per acre. For some unaccountable reason this experiment, in 1914, did not produce favorable increases on Plots 8, 9 and 10, as compared with Plots 5 and 6.

The average increase due to cottonseed meal was 102 pounds seed cotton per acre; to acid phosphate, 96 pounds; and to kainit, 84 pounds of seed cotton per acre.

Nitrate of soda, at the rate of 100 pounds per acre, when applied when the plants were about 6 inches high, was less effective by 88 pounds of seed cotton per acre, than was cottonseed meal when applied in a complete fertilizer before planting.

H. D. TEMPLETON—1915

A regular cotton fertilizer experiment like the one in 1914, was made by Mr. Templeton on these same plots in 1915. All plots were damaged by dry weather after August 15.

The largest increase in seed cotton per acre, 408 pounds, produced at a profit of \$12.14 per acre, was secured on Plot 10, where an application of the following fertilizers was used:

200 pounds cottonseed meal per acre

240 pounds acid phosphate per acre

100 pounds kainit per acre.

The second largest increase, 384 pounds seed cotton per acre, and the second largest profit, \$9.96 per acre, were obtained from Plot 9, fertilized with a complete fertilizer like on Plot 10, except that it contained 200 pounds of kainit instead of 100 pounds.

Nitrogen, phosphate, and potash with one exception,

gave an increased yield in seed cotton per acre, with an average increase of 170 pounds seed cotton per acre due to cottonseed meal; of 86 pounds, attributable to acid phosphate and 96 pounds, in consequence of the application of 200 pounds kainit.

Cottonseed meal, in 1914, applied before planting, was more effective by 136 pounds seed cotton per acre than was nitrate of soda applied about May 15.

J. M. TEMPLETON—1916.

The same experiment which was conducted by H. D. Templeton in 1914 and again in 1915 was conducted by J. M. Templeton in 1916. Fifty pounds of muriate of potash per acre was used as a source of potash on this test instead of 200 pounds of kainit.

It is to be remembered that 1916 was a most unfavorable year for the production of cotton in central Alabama, due to excessive rains in July and the heavy infestation of boll weevils which followed. These injuries may have been the cause of the low yields on the plots of this test; although Mr. Templeton did not report this as being the case.

The largest profit, \$4.26 per acre, and the largest increase, 128 pounds seed cotton per acre, were obtained on Plot 5, fertilized per acre as follows:

200 pounds cottonseed meal
240 pounds acid phosphate.

The only other plot in the experiment producing a profit was Plot 2, on which 240 pounds of acid phosphate alone was used. The profit and increase on this plot being \$4.06, and 80 pounds seed cotton per acre.

In this unfavorable year the average increase due to the application of 200 pounds cottonseed meal was only 19 pounds seed cotton per acre; to acid phosphate at the rate of 240 pounds per acre, 93 pounds; while with kainit there was an average loss of 19 pounds seed cotton per acre.

Cottonseed meal, applied before planting, was more effective and produced an increase of 68 pounds more seed cotton per acre than did nitrate of soda, applied when the plants were about six inches high.

It is to be noticed that in this year of heavy infestation of boll weevil after about the first week of July, that acid phosphate, which hastened maturity, was of prime importance.

H. D. TEMPLETON AND J. M. TEMPLETON
(Average all years.)

The average of the results of these three experiments seem to indicate a need of nitrogen and phosphate, and probably potash on this soil. However, the unfavorable conditions which entered make the results somewhat questionable.

The highest average increase for the three years was 227 pounds seed cotton per acre, obtained where cottonseed meal and acid phosphate were used on Plot 5. However, this average increase is closely followed by the average increase on Plots 10 and 9, fertilized with a complete fertilizer containing 100 and 200 pounds kainit each, respectively. On the average, potash in a complete fertilizer was not profitable, but this is probably due to unusually dry weather after August 15, 1914, and to unusually wet weather after July 15, 1916. Good results were obtained from potash during the season of 1915.

Nitrate of soda, on the average, was not as profitable as cottonseed meal.

Experiments in Elmore County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	ECLECTIC 1914			ECLECTIC 1915			ECLECTIC* 1916			ECLECTIC Average All Years		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from 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	Average yield of seed cotton per acre	Average increase of seed cotton acre per	Ave. profit from fertilizer per acre
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$	Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	832	—96	—5.11	752	160	4.04	128	0	—3.50	571	21	—1.52
2	240	Acid phosphate	944	16	—1.33	608	16	—0.98	208	80	4.06	587	37	0.58
3		No fertilizer	928			592			128			549		
4	200	Kainit	960	44	—0.43	736	128	3.37	96	—24	—15.85	597	49	4.30
5	200	Cotton seed meal	1200	296	1.83	880	256	6.58	240	128	4.26	773	227	4.22
	240	Acid phosphate												
6	200	Cotton seed meal	1136	244	0.97	800	160	1.78	112	8	—16.88	683	137	—4.71
	200	Kainit												
7		No fertilizer	880			656			96			544		
8	240	Acid phosphate	976	120	—0.44	768	136	2.04	176	76	—10.25	640	111	—2.88
	200	Kainit												
9	200	Cotton seed meal	976	144	—2.91	992	384	9.96	176	72	—14.06	715	200	—2.34
	240	Acid phosphate												
	200	Kainit												
10	200	Cotton seed meal	928	120	—2.74	992	408	12.14	208	100	—4.90	709	209	1.50
	240	Acid phosphate												
	100	Kainit												
11		No fertilizer	784			560			112			485		
21	240	Acid phosphate	992	208	—0.80	832	272	6.16	144	32	—10.39	656	171	—1.68
	100	Kainit												
	100	Nitrate of soda												

*50 pounds muriate of potash used instead of 200 pounds kainit as source of potash in 1916.

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

	1914	1915	1916	Av.
To unfertilized plot	96	160	0	85
To acid phosphate plot	280	240	48	189
To kainit plot	200	32	32	88
To acid phosphate and kainit plot	24	248	-4	89
Average increase with cottonseed meal	102	170	19	97

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

To unfertilized plot	16	16	80	37
To cottonseed meal plot	392	96	128	205
To kainit plot	76	8	100	61
To cottonseed meal and kainit plot	-100	224	64	63
Average increase with acid phosphate	96	86	93	92

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	44	128	-24	49
To cottonseed meal plot	340	0	8	116
To acid phosphate plot	104	120	-4	73
To cottonseed meal and acid phosphate plot	-152	128	-56	-27
Average increase with kainit	84	94	-19	53
Increase from use of cottonseed meal in complete fertilizer	24	248	-4	89
Increase from use of nitrate of soda	112	112	-72	51
Cottonseed meal better than nitrate of soda by	-88	136	68	39

*50 pounds muriate of potash per acre used instead of 200 pounds kainit in 1916.

MACON COUNTY, 2 MILES EAST OF TUSKEGEE.

W. C. HARDWICK—1914.

Light colored sandy loam, with stiffer red subsoil.

The three preceding crops were cotton. A good stand was obtained on all plots.

The largest increase, 360 pounds of seed cotton per acre, and the largest profit, \$2.54 per acre, were obtained on Plot 12, fertilized as follows:

- 240 pounds acid phosphate per acre
- 100 pounds kainit per acre
- 100 pounds nitrate of soda per acre.

The average increase due to cotton seed meal was 140 pounds seed cotton per acre; to acid phosphate, 77 pounds; and to kainit, 61 pounds.

Nitrate of soda was more effective than cottonseed meal by 112 pounds seed cotton per acre.

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

To unfertilized plot	96 lbs.
To acid phosphate plot	196 lbs.
To kainit plot	124 lbs.
To acid phosphate and kainit plot	144 lbs.
Average increase with cottonseed meal	140 lbs.

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

To unfertilized plot	—40 lbs.
To cottonseed meal plot	66 lbs.
To kainit plot	130 lbs.
To cottonseed meal and kainit plot	150 lbs.
Average increase with acid phosphate	77 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	—18 lbs.
To cottonseed meal plot	10 lbs.
To acid phosphate plot	152 lbs.
To cottonseed meal and acid phosphate plot ..	100 lbs.
Average increase with kainit	61 lbs.

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

To use of 200 pounds kainit	100 lbs.
To use of 100 pounds kainit	92 lbs.

Increase from use of cottonseed meal in complete fertilizer

.....	144 lbs.
Increase from use of nitrate of soda	256 lbs.
Nitrate of soda better than cottonseed meal by ..	112 lbs.

Experiments in Macon County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	TUSKEGEE 1914			NOTASULGA 1914		
			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	776	96	-0.89	1008	336	4.39
2	240	Acid phosphate	640	-40	-2.56	864	192	2.54
3		No fertilizer	680			672		
4	200	Kainit	688	-18	-1.80	928	212	3.26
5	200	Cotton seed meal	888	156	-1.25	1056	296	1.83
	240	Acid phosphate						
6	200	Cotton seed meal	864	106	-2.07	1056	252	1.14
	200	Kainit						
7		No fertilizer	784			848		
8	240	Acid phosphate	928	112	-0.62	976	172	0.70
	200	Kainit						
9	200	Cotton seed meal	1104	256	-0.45	912	152	-2.74
	240	Acid phosphate						
	200	Kainit						
10	200	Cotton seed meal	1128	248	0.08	976	260	0.34
	240	Acid phosphate						
11	100	Kainit	912			672		
	240	Acid phosphate						
12	100	Kainit	1272	360	2.54	960	288	0.96
	100	Nitrate of soda						

MACON COUNTY, 1/2 MILE SOUTHWEST OF NOTASULGA.

W. J. BRIDGES—1914.

Light colored sandy loam, with stiffer subsoil

This upland field had been many years in cultivation. The preceding crops were corn, preceded by cotton. The stand on all plots was good.

In this dry year cottonseed meal alone gave the largest increase in yield, 336 pounds seed cotton per acre, and the largest profit, \$4.39.

The average increase due to cottonseed meal was 115 pounds seed cotton per acre; while on the average, with both phosphate and potash, comparatively no increase or decrease was obtained.

Nitrate of soda applied June 10, was more effective by 28 pounds seed cotton per acre than was cottonseed meal applied before planting.

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

To unfertilized plot	336 lbs.
To acid phosphate plot	104 lbs.
To kainit plot	40 lbs.
To acid phosphate and kainit plot	—20 lbs.
Average increase with cottonseed meal	115 lbs.

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

To unfertilized plot	192 lbs.
To cottonseed meal plot	—40 lbs.
To kainit plot	—40 lbs.
To cottonseed meal and kainit plot	—100 lbs.
Average increase with acid phosphate	3 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	212 lbs.
To cottonseed meal plot	—84 lbs.
To acid phosphate plot	—20 lbs.
To cottonseed meal and acid phosphate plot	—144 lbs.
Average increase with kainit	—9 lbs.

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

To use of 200 pounds kainit	—144 lbs.
To use of 100 pounds kainit	36 lbs.

MONROE COUNTY, 3 MILES WEST OF
MONROEVILLE.

J. R. CARTER—1912.

Gray sandy loam, with stiffer red subsoil.

For the results of this experiment see table on page 32 of the Alabama Experiment Station Bulletin No. 169.

J. R. CARTER—1914.

In 1914, Mr. Carter conducted an experiment on the same plots as in 1912.

The largest increase, 322 pounds seed cotton per acre, was secured on Plot 10, fertilized per acre as follows:

200 pounds cottonseed meal
240 pounds acid phosphate
100 pounds kainit.

The largest profit, \$2.72 per acre, was made on Plot 2, fertilized with acid phosphate alone at the rate of 240 pounds per acre.

The average increase attributable to cottonseed meal was 96 pounds seed cotton per acre; to acid phosphate, 183 pounds; while with kainit there was an average

loss of 6 pounds seed cotton per acre. However, kainit when applied in a complete fertilizer at the rate of 100 and 200 pounds per acre produced increases of 154 and 116 pounds seed cotton per acre, respectively.

Nitrate of soda and cottonseed meal were about equally effective on this soil in 1914.

J. R. CARTER—1915.

An experiment with cotton in 1915, on the same plots as the experiments in 1914 and in 1912, was conducted by Mr. Carter. Boll weevils were present and did much damage. The low yield per acre was probably due to the injury which they did.

The increase in seed cotton per acre of 176 pounds where 200 pounds cottonseed meal, 240 pounds acid phosphate and 200 pounds kainit per acre were applied on Plot 9, is the largest in the experiment. This, however, is closely followed by Plot 10, fertilized with

200 pounds cottonseed meal
240 pounds acid phosphate
100 pounds kainit

The increase on Plot 10 was 170 pounds seed cotton per acre, produced at a profit of \$1.67.

In this rather unfavorable year, the average increase attributable to cottonseed meal was 88 pounds seed cotton per acre; to acid phosphate, 37 pounds; and to kainit, 43 pounds seed cotton per acre.

Kainit at the rate of 100 pounds per acre when applied in a complete fertilizer was practically as effective as 200 pounds.

Cottonseed meal gave an increase of 34 pounds seed cotton per acre more than did nitrate of soda.

J. R. CARTER,

(Average all years.)

An average of the three experiments conducted by Mr. Carter on this gray sandy loam, with rather stiff red subsoil shows that a complete fertilizer is needed.

Plots 9, 10 and 12 all received a complete fertilizer and gave increases of 353 pounds, 343 pounds and 312 pounds of seed cotton per acre, respectively.

It appears, however, that 100 pounds of kainit is practically as effective on this soil as 200 pounds, and that cottonseed meal was slightly more effective than nitrate of soda when both were applied on plots having an application of 240 pounds acid phosphate and 100 pounds kainit.

Experiments in Monroe County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	MONROEVILLE 1912			MONROEVILLE 1914			MONROEVILLE 1915			MONROEVILLE Average All Years		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from 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	Average yield seed cotton per acre	Average increase of seed cotton per acre	Average profit per acre
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$	Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	736	392	12.68	1000	40	-2.12	288	96	1.22	675	176	3.93
2	240	Acid phosphate	504	160	4.72	1160	200	2.72	232	40	0.08	632	133	2.51
3		No fertilizer	344			960			192			495		
4	200	Kainit	432	98	2.52	840	104	-3.69	232	34	-0.76	501	9	-0.64
5	200	Cotton seed meal	616	292	7.00	1096	168	-0.98	312	108	0.07	675	189	2.03
	240	Acid phosphate												
6	200	Cotton seed meal	640	326	8.64	1008	96	-2.29	336	126	0.28	661	183	2.21
	200	Kainit												
7		No fertilizer	304			896			216			472		
8	240	Acid phosphate	552	256	7.16	992	110	-0.66	296	80	-0.42	613	149	2.03
	200	Kainit												
9	200	Cotton seed meal	888	600	17.92	1152	284	0.17	392	176	0.80	811	353	6.30
	240	Acid phosphate												
10	200	Cotton seed meal	816	536	16.06	1176	322	1.70	386	170	1.67	793	343	6.48
	240	Acid phosphate												
11	100	Kainit	272			840			216			443		
12	240	Acid phosphate	760	488	14.64	1152	312	1.48	352	136	0.17	755	312	54.3
	100	Nitrate of soda												

The average increase for the three years, due to cottonseed meal was 153 pounds seed cotton per acre; to acid phosphate, 114 pounds; and to kainit, 49 pounds seed cotton per acre.

Increase in seed cotton per acre due to cottonseed meal, to acid phosphate, to kainit, and to nitrate of soda.

	1912	1914	1915	Av.
<i>Increase of seed cotton per acre when cottonseed meal was added:</i>				
To unfertilized plot.....	392	40	96	176
To acid phosphate plot.....	132	—32	68	56
To kainit plot.....	228	200	92	173
To acid phosphate and kainit plot	344	174	96	205
Average increase with cottonseed meal	274	96	88	153
<i>Increase of seed cotton per acre when acid phosphate was added:</i>				
To unfertilized plot.....	160	200	40	133
To cottonseed meal plot.....	—100	128	12	13
To kainit plot.....	158	214	46	139
To cottonseed meal and kainit plot	274	188	50	171
Average increase with acid phosphate	123	183	37	114
<i>Increase of seed cotton per acre when kainit was added:</i>				
To unfertilized plot.....	98	—104	34	9
To cottonseed meal plot.....	—66	56	30	7
To acid phosphate plot.....	96	—90	40	15
To cottonseed meal and acid phosphate plot.....	308	116	68	164
Average increase with kainit....	109	—6	43	49
<i>Increase of seed cotton per acre from use of different quantities of kainit:</i>				
To use of 200 pounds kainit.....	308	116	68	164
To use of 100 pounds kainit.....	244	154	62	153
Increase from use of cottonseed meal in complete fertilizer....	344	174	96	205
Increase from use of nitrate of soda	296	164	62	174
Cottonseed meal better than nitrate of soda by.....	48	10	34	31

MONROE COUNTY, 5 MILES SOUTHWEST OF
MONROEVILLE.

J. L. HOLLOWAY—1914.

Gray sandy loam, with stiffer reddish subsoil.

This land had been in cultivation for many years. The preceding crop was cotton. A fair stand was obtained on all plots. Some damage was done by boll weevils.

This experiment although damaged by boll weevils and dry weather agrees in the main with one conducted in the same field the preceding year in that both show nitrogen to be the element chiefly needed,

phosphate as of relatively little value under these conditions, and 200 pounds of kainit as apparently reducing the yield. This last result may possibly have been due to the effect of this amount of kainit in delaying maturity, which is disadvantageous under conditions of boll weevil infestation.

Cottonseed meal applied before planting was much more effective than nitrate of soda applied very late—July 6.

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

To unfertilized plot	264 lbs.
To acid phosphate plot	156 lbs.
To kainit plot	116 lbs.
To acid phosphate and kainit plot	24 lbs.
Average increase with cottonseed meal	140 lbs.

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

To unfertilized plot	104 lbs.
To cottonseed meal plot	—4 lbs.
To kainit plot	10 lbs.
To cottonseed meal and kainit plot	—82 lbs.
Average increase with acid phosphate	7 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	—10 lbs.
To cottonseed meal plot	—158 lbs.
To acid phosphate plot	—104 lbs.
To cottonseed meal and acid phosphate plot	—236 lbs.
Average increase with kainit	—127 lbs.

Experiments in Monroe and Clarke Counties

			MONROEVILLE 1914			THOMASVILLE* 1918		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton	Increase over	Profit from	Yield seed cotton	Increase over	Profit from
			per acre	unfertilized plot	fertilizer	per acre	unfertilized plot	fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	640	264	2.81	408	120	7.70
2	240	Acid phosphate	480	104	0.61	304	16	-0.76
3		No fertilizer	376			288		
4	200	Kainit	360	-10	-1.62	536	247	19.91
5	200	Cotton seed meal	624	260	1.04	556	266	21.24
	240	Acid phosphate						
6	200	Cotton seed meal	464	106	-2.07	572	281	18.15
	200	Kainit						
7		No fertilizer	352			292		
8	240	Acid phosphate	352	0	-3.08	504	197	11.89
	200	Kainit						
9	200	Cotton seed meal	376	24	-5.55	608	286	16.18
	240	Acid phosphate						
10	200	Kainit	560	208	-0.80	660	323	23.88
	240	Acid phosphate						
11	100	Kainit	352			352		
12	240	Acid phosphate	360	8	-5.20	752	400	32.85
	100	Nitrate of soda						

*120 pounds alkali salts used instead of 200 pounds kainit as source of potash in 1918.

CLARKE COUNTY, 6 MILES WEST OF
THOMASVILLE.

R. L. HEARRON—1918.

Gray sandy loam, with yellow stiffer subsoil.

The land on which this experiment was conducted had been in cultivation many years. Two fertilizer experiments with corn had preceded the cotton fertilizer experiment. The stand on all plots was rather poor but uniform.

The average increase in seed cotton per acre due to cottonseed meal was 123 pounds; to acid phosphate, 29 pounds; while with kainit there was an average increase of 152 pounds seed cotton per acre. The largest

profit, \$23.88 per acre, was obtained on Plot 10, fertilized per acre as follows:

200 pounds cottonseed meal
 240 pounds acid phosphate
 60 pounds alkali salts (equivalent to 100 pounds kainit).

This plot also made the largest increase in seed cotton per acre, 323 pounds.

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

To unfertilized plot	120 lbs.
To acid phosphate plot	250 lbs.
To kainit plot	34 lbs.
To acid phosphate and kainit plot	89 lbs.
Average increase with cottonseed meal	123 lbs.

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

To unfertilized plot	16 lbs.
To cottonseed meal plot	146 ll s.
To kainit plot	—50 lbs.
To cottonseed meal and kainit plot	5 lbs.
Average increase with acid phosphate	29 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	247 lbs.
To cottonseed meal plot	161 lbs.
To acid phosphate plot	181 lbs.
To cottonseed meal and acid phosphate plot ..	20 lbs.
Average increase with kainit	152 lbs.

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

To use of 200 pounds kainit	20 lbs.
To use of 100 pounds kainit	57 lbs.
Increase from use of cottonseed meal in complete fertilizer	89 lbs.
Increase from use of nitrate of soda	166 lbs.
Nitrate of soda better than cottonseed meal by ..	77 lbs.

CLARKE COUNTY, 3 MILES SOUTHWEST OF GROVE HILL.

J. WINTERS CALHOUN—1913.

Gray sandy soil, with stiffer red subsoil.

The land on which this experiment was conducted had been in cultivation about ten years. The crop planted previous to the experiment was cotton. The stand on all plots was good. Boll weevils were present but did very little damage. (For a discussion of the results and tables see Alabama Experiment Station Bulletin No. 174; page 168-170. Also see table on page 194 of this bulletin.)

J. WINTERS CALHOUN—1914.

In 1914, an experiment was repeated on the same plots as in 1913. The seasons were very favorable and the test was well conducted.

The largest increase in seed cotton per acre, 544 pounds, was received from Plot 9, fertilized with
 200 pounds cottonseed meal per acre
 240 pounds acid phosphate per acre
 200 pounds kainit per acre.

The next largest increase, 520 pounds of seed cotton per acre, and a profit of \$6.06 per acre, was made on Plot 10, which received the same amounts of cottonseed meal and acid phosphate as Plot 9, but only one-half as much kainit.

The average increase attributable to 200 pounds of cottonseed meal per acre was 210 pounds of seed cotton; to 240 pounds acid phosphate, 200 pounds seed cotton; and to 200 pounds of kainit, 28 pounds seed cotton per acre.

Nitrate of soda, applied when the plants were about six inches tall, was not as effective by 152 pounds of seed cotton per acre as cottonseed meal, applied before planting.

J. WINTERS CALHOUN—1915.

The above experiment was continued in 1915, the same plots as in 1913 and 1914 being used. The stand was fair but uniform. Boll weevils are reported to have damaged the plots between 30 and 50 per cent.

The largest profit, \$5.45 per acre, and the largest increase in seed cotton per acre, 256 pounds, were made on Plot 10, fertilized per acre as follows:

200 pounds cottonseed meal
 240 pounds acid phosphate
 100 pounds kainit.

The average increase due to cottonseed meal was 72 pounds of seed cotton per acre; to acid phosphate, 84 pounds seed cotton per acre; and to kainit, 20 pounds seed cotton per acre.

Cottonseed meal was more effective than nitrate of soda by 112 pounds seed cotton per acre.

J. WINTERS CALHOUN,
 (Average all years.)

The average of three year's experimental work by Mr. Calhoun (See table on page 194) shows that the most important fertilizer for this particular soil in

these three years was the mixture used on Plot 10 which was composed of

200 pounds cottonseed meal per acre

240 pounds acid phosphate per acre

100 pounds kainit per acre.

The average profit due to this mixture was \$6.85 per acre, and the average increase per acre was 368 pounds seed cotton.

On the average, cottonseed meal when used alone and acid phosphate when used alone gave good profits, although the average increases due to these single fertilizers were not as great by more than 80 pounds per acre as was the increase of 340 pounds seed cotton per acre obtained by the use of a complete fertilizer on Plot 9, composed of

200 pounds cottonseed meal

240 pounds acid phosphate

200 pounds kainit.

The average increase for the three years due to cottonseed meal was 133 pounds seed cotton per acre; to acid phosphate, 140 pounds; and to kainit, only 15 pounds seed cotton per acre. One hundred pounds kainit per acre when used in a complete fertilizer was more effective and more profitable than was 200 pounds.

Nitrate of soda and cottonseed meal, on the average, were of equal importance.

Experiments in Clarke County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	GROVE HILL 1913			GROVE HILL 1914			GROVE HILL 1915			GROVE HILL Average All Years		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from 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	Average yield of seed cotton per acre	Average increase of seed cotton per acre	Average profit per acre
1	Lbs. 200	Cotton seed meal	832	256	8.26	1072	416	6.15	336	112	1.93	747	261	5.45
2	240	Acid phosphate	784	208	7.47	928	272	4.30	352	128	3.95	688	203	5.24
3		No fertilizer	576			656			224			485		
4	200	Kainit	592	12	-0.87	736	52	-0.26	256	40	-0.50	528	35	-0.54
5	200	Cotton seed meal	816	232	5.53	1040	328	2.54	352	144	1.66	736	235	3.24
	240	Acid phosphate												
6	200	Cotton seed meal	736	148	2.11	944	204	0.09	304	104	-0.68	661	152	0.51
	200	Kainit												
7		No fertilizer	592			768			192			517		
8	240	Acid phosphate	848	232	7.13	1104	328	4.14	304	112	0.99	752	224	4.09
	200	Kainit												
9	200	Cotton seed meal	928	288	6.59	1328	544	5.89	400	208	2.21	885	347	4.90
	240	Acid phosphate												
	200	Kainit												
10	200	Cotton seed meal	992	328	9.05	1312	520	6.06	448	256	5.45	917	368	6.85
	240	Acid phosphate												
	100	Kainit												
11		No fertilizer	688			800			192			560		
12	240	Acid phosphate	912	224	4.48	1168	368	2.72	336	144	0.53	805	245	2.58
	100	Kainit												
	100	Nitrate of soda												

Increase in seed cotton per acre due to cottonseed meal, to acid phosphate, to kainit and to nitrate of soda.

	1913	1914	1915	Av.
<i>Increase of seed cotton per acre when cottonseed meal was added:</i>				
To unfertilized plot	256	416	112	261
To acid phosphate plot	24	56	16	32
To kainit plot	136	152	64	117
To acid phosphate and kainit plot	56	216	96	123
Average increase with cottonseed meal	118	210	72	133
<i>Increase of seed cotton per acre when acid phosphate was added:</i>				
To unfertilized plot	208	272	128	203
To cottonseed meal plot	—24	—88	32	—27
To kainit plot	220	276	72	189
To cottonseed meal and kainit plot	140	340	104	195
Average increase with acid phosphate	136	200	84	140
<i>Increase of seed cotton per acre when kainit was added:</i>				
To unfertilized plot	12	52	40	35
To cottonseed meal plot	—108	—212	—8	—109
To acid phosphate plot	24	56	—16	21
To cottonseed meal and acid phosphate plot	56	216	64	112
Average increase with kainit	—4	28	20	15
<i>Increase of seed cotton per acre from use of different quantities of kainit:</i>				
To use of 200 pounds kainit	56	216	64	112
To use of 100 pounds kainit	96	192	112	133
Increase from use of cottonseed meal in complete fertilizer	56	216	96	123
Increase from use of nitrate of soda	—48	64	—16	0
Cottonseed meal better than nitrate of soda by	104	152	112	123

WASHINGTON COUNTY, 4 MILES NORTHEAST OF CARSON, NEAR LEROY.

W. F. MELTON—1915.

Dark gray loam, with stiffer yellow subsoil.

The soil on which this experiment was located is described by Louis A. Hurst of the Bureau of Soils, Washington, D. C., as Kalmia Fine Sandy Loam. Mr. Hurst says that this soil is practically the same as Norfolk soils of this description. The only difference in the two is in their position on the terraces and upland respectively, the Kalmia soil being located on what

is known as the Tombigbee valley terraces. The results on this soil are applicable to both series. The land on which this experiment was conducted had been in cultivation about twenty years. The original growth of trees was long-leaf pine and dogwood. Cotton grew on this experimental plot in 1914, and corn preceded the cotton for two years. The stand was only fair but uniform on all plots. Excessive rains in the early part of July caused heavy shedding and excessive damage, which probably caused the low yields on all plots.

No fertilizers or combination of fertilizers, except where cottonseed meal and acid phosphate were used on Plot 5, produced a profit, and this profit was only 78 cents per acre. However, the increase in seed cotton per acre on this plot, 124 pounds, was equalled by the increase on Plot 10, on which the same fertilizers were used with an additional 100 pounds of kainit.

Although the average increase in seed cotton per acre was very small on this experiment it indicates that nitrogen is needed. Cottonseed meal at the rate of 200 pounds per acre produced an increase of 81 pounds seed cotton per acre, while acid phosphate and kainit produced increases, respectively, of 24 and 22 pounds seed cotton per acre.

Cottonseed meal applied before planting was more effective by 52 pounds of seed cotton per acre than nitrate of soda applied June 10.

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

To unfertilized plot	48 lbs.
To acid phosphate plot	124 lbs.
To kainit plot	68 lbs.
To acid phosphate and kainit plot	84 lbs.
Average increase with cottonseed meal	81 lbs.

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

To unfertilized plot	0 lbs.
To cottonseed meal plot	76 lbs.
To kainit plot	2 lbs.
To cottonseed meal and kainit plot	18 lbs.
Average increase with acid phosphate	24 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	26 lbs.
To cottonseed meal plot	46 lbs.
To acid phosphate plot	28 lbs.
To cottonseed meal and acid phosphate plot ..	-12 lbs.
Average increase with kainit	22 lbs.

Increase from use of cottonseed meal in complete fertilizer	84 lbs.
Increase from use of nitrate of soda	32 lbs.
Cottonseed meal better than nitrate of soda by ..	52 lbs.

Experiments in Washington and Wilcox Counties

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	LEROY 1915			CAMDEN 1914		
			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 ..	360	48	-0.89	728	294	3.47
2	240	Acid phosphate	312	0	-1.68	576	142	1.44
3		No fertilizer	312			424		
4	200	Kainit	328	26	-1.12	496	72	0.18
5	200	Cotton seed meal ..	416	124	0.78	456	32	-3.98
	240	Acid phosphate						
6	200	Cotton seed meal ..	376	94	-1.12	680	256	1.23
	200	Kainit						
7		No fertilizer	272			424		
8	240	Acid phosphate	312	28	-2.71	488	40	-2.20
	200	Kainit						
9	200	Cotton seed meal ..	408	112	-2.01	776	304	0.61
	240	Acid phosphate						
10	200	Cotton seed meal ..	432	124	-0.35	928	432	4.12
	240	Acid phosphate						
11	100	Kainit	320			520		
		No fertilizer						
12	240	Acid phosphate	392	72	-2.64	816	296	1.13
	100	Kainit						
	100	Nitrate of soda ..						

WILCOX COUNTY, 7 MILES WEST OF CAMDEN.

G. M. COOK—1914.

Gray loam soil, with light colored stiffer subsoil.

This branch bottom land had been in cultivation many years. A similar experiment with cotton was conducted on these plots in 1913, but the results proved inconclusive because of the damage done by dry weather.

The largest increase in yield, 432 pounds of seed cotton per acre, was obtained on Plot 10, fertilized as follows per acre:

200 pounds cottonseed meal

240 pounds acid phosphate

100 pounds kainit

This plot also afforded the largest net profit.

The average increase due to cottonseed meal was 158 pounds seed cotton per acre; to acid phosphate, 26 pounds; and to kainit, 51 pounds.

Cottonseed meal was superior to nitrate of soda.

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

To unfertilized plot	294 lbs.
To acid phosphate plot	—110 lbs.
To kainit plot	184 lbs.
To acid phosphate and kainit plot	264 lbs.
Average increase with cottonseed meal	158 lbs.

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

To unfertilized plot	142 lbs.
To cottonseed meal plot	—262 lbs.
To kainit plot	—32 lbs.
To cottonseed meal and kainit plot	84 lbs.
Average increase with acid phosphate	26 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	72 lbs.
To cottonseed meal plot	—38 lbs.
To acid phosphate plot	—102 lbs.
To cottonseed meal and acid phosphate plot ..	272 lbs.
Average increase with kainit	51 lbs.

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

To use of 200 pounds kainit	272 lbs.
To use of 100 pounds kainit	400 lbs.
Increase from use of cottonseed meal in complete fertilizer	264 lbs.
Increase from use of nitrate of soda	128 lbs.
Cottonseed meal better than nitrate of soda by ..	136 lbs.

WILCOX COUNTY, $\frac{3}{4}$ MILES WEST OF McWILLIAMS.

R. F. CHAPPELL—1913.

Gray sandy soil, with stiffer yellow subsoil.

For yields of this experiment in 1913 see table on page 201. Comment by the writers on this experiment can be found in Bulletin No. 174 of the Alabama Experiment Station.

R. F. CHAPPELL—1915.

In 1915, Mr. Chappell made an experiment on the same plots as in 1913. The stand on all plots was uniform, each plot being thinned to the same number of stalks. Boll weevils did some damage, but this damage is reported as being uniform. Corn was planted on these plots in 1914.

The largest profit was secured where a complete fertilizer containing nitrate of soda was used on Plot 12. This profit was \$5.10 per acre, and came from an increase of 248 pounds seed cotton. The next largest increase, 204 pounds seed cotton per acre, came from the application on Plot 9 of 200 pounds cottonseed meal, 240 pounds acid phosphate, and 200 pounds kainit.

R. F. CHAPPELL—1916.

In 1916, this experiment was conducted on the same plots as in 1915 and 1913. However, the excessive rains of July and the heavy infestation of boll weevils which followed are probably the reasons for the very low yields and increases in seed cotton per acre, together with the financial losses which are shown in the table on page 201. This experiment would not be classed as conclusive but for the fact that it is to be used in an average of several years.

R. F. CHAPPELL—1917.

In 1917, this experiment was conducted on the same plots as in 1916. The stand was poor but uniform. Boll weevils damaged the test to some extent late in the season.

It is especially interesting to compare the results of this experiment in 1917 with the results of the 1916 experiment. The largest average profit in 1917 was \$51.96 per acre, which was due to an increase of 592 pounds seed cotton per acre on Plot 12, where an application of 240 pounds acid phosphate, 100 pounds kainit, and 100 pounds nitrate of soda was used. This plot in 1916 made an increase of 24 pounds seed cotton per acre at a financial loss of \$11.00. The next largest increase in seed cotton per acre in 1917, 408 pounds, produced at a profit of \$23.72, resulted from the application of a complete fertilizer containing 200 pounds kainit on Plot 9.

The average increase due to cottonseed meal in 1917 was 193 pounds seed cotton per acre; to acid phosphate, 85 pounds; and to kainit, 177 pounds seed cotton per acre.

Nitrate of soda, applied June 9, was more effective by 292 pounds seed cotton per acre than was cottonseed meal, applied before planting.

R. F. CHAPPELL,
(Average all years.)

An average of all years that this experiment was made on the same plots shows that this soil needed a complete fertilizer, and that the best source of nitrogen for the soil was nitrate of soda.

The average increase on Plot 12 was 314 pounds seed cotton per acre, where a per acre application of 240 pounds acid phosphate, 100 pounds kainit and 100 pounds nitrate of soda was used. The next largest increase, 256 pounds seed cotton per acre, resulted from an application of a complete fertilizer on Plot 9, which contained the following:

200 pounds cottonseed meal

240 pounds acid phosphate

200 pounds kainit

The average increase due to cottonseed meal in all years was 101 pounds seed cotton per acre; to acid phosphate, 45 pounds; and to kainit, 118 pounds.

Nitrate of soda, on the average, produced a greater increase than did cottonseed meal by 126 pounds seed cotton per acre.

Experiments in Wilcox County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	McWILLIAMS 1913			McWILLIAMS 1915			McWILLIAMS 1916*			McWILLIAMS 1917			McWILLIAMS Average All Years		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Average yield of seed cotton per acre	Average increase in seed cotton per acre	Average profit from fertilizer per acre
1	Lbs. 200	Cotton seed meal	Lbs. 560	Lbs. 104	\$ 1.58	Lbs. 280	Lbs. 32	\$ -1.59	Lbs. 36	Lbs. 8	\$ -2.88	Lbs. 944	Lbs. 80	\$ 3.80	Lbs. 455	Lbs. 56	\$ 0.23
2	240	Acid phosphate	472	16	-0.98	264	16	-0.98	40	12	-1.18	880	16	-0.40	414	15	-0.89
3		No fertilizer	456			248			28			864			399		
4	200	Kainit	616	152	5.29	280	32	-0.85	32	4	-13.69	912	36	-10.04	460	56	-4.82
5	200	Cotton seed meal	608	136	1.30	304	56	-2.22	44	16	-4.37	1072	184	13.08	507	98	1.95
	240	Acid phosphate															
6	200	Cotton seed meal	848	368	11.79	320	72	-2.09	48	20	-15.96	1248	348	19.28	616	202	3.26
	200	Kainit															
7		No fertilizer	488			248			28			912			419		
8	240	Acid phosphate	752	244	7.66	296	42	-2.09	52	23	-14.33	1120	196	5.40	555	126	-0.87
	200	Kainit															
9	200	Cotton seed meal	896	368	10.11	464	204	2.04	72	42	-16.37	1344	408	23.72	694	256	4.88
	240	Acid phosphate															
10	200	Kainit	816	268	6.41	416	150	0.79	66	35	-9.90	1248	300	18.84	637	188	4.04
	200	Cotton seed meal															
11	240	Acid phosphate	568			272			32			960			458		
	100	Kainit															
12	240	Acid phosphate	960	392	11.87	520	248	5.10	56	24	-11.00	1552	592	51.96	772	314	14.46
	100	Nitrate of soda															

*In 1916, 50 pounds muriate of potash used as source of potash instead of 200 pounds of kainit.

Increase in seed cotton per acre due to cottonseed meal, to acid phosphate, to kainit and to nitrate of soda.*

	1913	1915	1916	1917	Av.
<i>Increase of seed cotton per acre when cottonseed meal was added:</i>					
To unfertilized plot -----	104	32	8	80	56
To acid phosphate plot --	120	40	4	168	83
To kainit plot -----	216	40	16	312	146
To acid phosphate and kainit plot -----	124	162	19	212	129
Average increase with cottonseed meal -----	141	69	12	193	101
<i>Increase of seed cotton per acre when acid phosphate was added:</i>					
To unfertilized plot -----	16	16	12	16	15
To cottonseed meal plot -	32	24	8	104	42
To kainit plot -----	92	10	19	160	70
To cottonseed meal and kainit plot -----	0	132	22	60	54
Average increase with acid phosphate -----	35	46	15	85	45
<i>Increase of seed cotton per acre when kainit was added:</i>					
To unfertilized plot -----	152	32	4	36	56
To cottonseed meal plot -	264	40	12	268	146
To acid phosphate plot --	228	26	11	180	111
To cottonseed meal and acid phosphate plot---	232	148	26	224	158
Average increase with kainit -----	219	62	13	177	118
<i>Increase of seed cotton per acre when different quantities of kainit were used:</i>					
To use of 200 pounds kainit -----	232	148	26	224	158
To use of 100 pounds kainit -----	132	94	19	116	90
Increase from use of cottonseed meal in complete fertilizer -----	124	162	19	212	129
Increase from use of nitrate of soda -----	248	260	8	504	255
Nitrate of soda better than cottonseed meal by *50 pounds muriate of potash per acre used instead of 200 pounds kainit in 1916.	124	98	-11	292	126

R. F. CHAPPELL—1914.

In 1914, Mr. Chappell made an experiment on different plots from the tests previously noted in this bulletin, but on similar soil. This was new land and the results are not averaged in the table, on page 201, but appear below.

The two preceding crops were corn.

The largest profit, \$2.98 per acre, was obtained on Plot 1, fertilized with cottonseed meal alone. However, the largest increase in seed cotton per acre, 352 pounds, was obtained on Plot 12, fertilized per acre as follows:

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

The average increase due to cottonseed meal was 144 pounds seed cotton per acre; to acid phosphate, 57 pounds; while with kainit there was an average loss of 8 pounds.

Nitrate of soda, applied June 4, was more effective and more profitable than was cottonseed meal, applied before planting.

Experiment in Wilcox County

			MCWILLIAMS 1914		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilizer plot	Profit from fertilizers
	Lbs.		Lbs.	Lbs.	\$
1	200	Cotton seed meal ..	1096	272	2.98
2	240	Acid phosphate	1016	192	2.54
3		No fertilizer	824		
4	200	Kainit	904	60	-0.08
5	200	Cotton seed meal }	1088	224	0.25
	240	Acid phosphate ..			
6	200	Cotton seed meal }	1112	228	0.62
	200	Kainit			
7		No fertilizer	904		
8	240	Acid phosphate .. }	1040	134	-0.13
	200	Kainit			
9	200	Cotton seed meal }	1144	236	-0.89
	240	Acid phosphate ..			
	200	Kainit			
10	200	Cotton seed meal }	1104	194	-1.11
	240	Acid phosphate ..			
	100	Kainit			
11		No fertilizer	912		
12	240	Acid phosphate .. }	1264	352	2.36
	100	Kainit			
	100	Nitrate of soda ..			

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

To unfertilized plot	272 lbs.
To acid phosphate plot	32 lbs.
To kainit plot	168 lbs.
To acid phosphate and kainit plot	102 lbs.
Average increase with cottonseed meal	144 lbs.

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

To unfertilized plot	192 lbs.
To cottonseed meal plot	—48 lbs.
To kainit plot	74 lbs.
To cottonseed meal and kainit plot	8 lbs.
Average increase with acid phosphate	57 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	60 lbs.
To cottonseed meal plot	—44 lbs.
To acid phosphate plot	—58 lbs.
To cottonseed meal and acid phosphate plot ..	12 lbs.
Average increase with kainit	—8 lbs.

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

To use of 200 pounds kainit	12 lbs.
To use of 100 pounds kainit	—30 lbs.

Increase from use of cottonseed meal in complete fertilizer

102 lbs.

Increase from use of nitrate of soda

260 lbs.

Nitrate of soda better than cottonseed meal by ..

158 lbs.

BUTLER COUNTY, 7 MILES NORTHEAST OF GREENVILLE.

E. L. GRAYDON—1914.

Gray sandy soil, with fine yellow sandy subsoil.

The land on which this experiment was conducted had been in cultivation many years. The crop in 1913 was cotton; and corn, in 1912. The original forest growth was oak, hickory and short-leaf pine. The entire season was reported as having been very dry.

The largest increase in yield of seed cotton per acre, 384 pounds was obtained on Plot 5, fertilized with 200 pounds cottonseed meal and 240 pounds acid phosphate. This plot also gave the largest profit, \$3.77 per acre. The second largest increase, 296 pounds seed cotton per acre, and the second largest profit, \$3.51 per acre, were obtained on Plot 1, fertilized with 200 pounds cottonseed meal per acre.

The average increase attributable to cottonseed meal was 180 pounds seed cotton per acre; to acid phosphate, 40 pounds; while with kainit, there was an average loss of 40 pounds seed cotton per acre.

Cottonseed meal, applied at the rate of 200 pounds per acre before planting in a complete fertilizer, was

not as effective by 96 pounds seed cotton per acre as was nitrate of soda, applied the first half of June.

E. L. GRAYDON—1916.

In 1916, Mr. Graydon made a similar experiment with cotton on these plots. The experiment was preceded by a corn experiment of the same kind in 1915. The stand on all plots was good. The excessive rains in July produced a heavy growth of foliage, which was favorable to boll weevil infestation; hence the low yield recorded in the tables.

In this unfavorable year it is especially noticeable that satisfactory profits were made on some of the plots. On plot 12, the largest profit, \$10.56 per acre, and the largest increase due to fertilizers, 304 pounds seed cotton per acre, were obtained. This plot was fertilized with

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

Increases of 228 pounds seed cotton per acre and 176 pounds seed cotton per acre were obtained on Plots 10 and 9, respectively.

The average increase in this unfavorable year attributable to cottonseed meal was 73 pounds seed cotton per acre; to acid phosphate, 47 pounds; and to kainit, 39 pounds seed cotton per acre.

One hundred pounds of kainit was more effective by 52 pounds seed cotton per acre than was 200 pounds.

Nitrate of soda, applied about June 1, was more effective by 76 pounds seed cotton per acre than cottonseed meal, applied before planting.

E. L. GRAYDON—1918.

After making a fertilizer experiment with corn on these plots in 1917, Mr. Graydon conducted a third experiment with cotton on the same plots. In 1918, with less rainfall and a much lighter infestation of boll weevils than in 1916, increases and profits on practically all plots were greater than in 1916.

The largest profit, \$19.48 per acre, and the largest increase due to fertilizers were obtained on Plot 9, fertilized as follows:

200 pounds cottonseed meal
240 pounds acid phosphate
120 pounds alkali salts (equivalent to 200 pounds kainit)

The next largest profit, \$17.94 per acre, was afforded by Plot 5, fertilized with 200 pounds cottonseed meal, and 240 pounds acid phosphate. This plot, however, ranked fourth in increase in seed cotton per acre. Plots 12 and 10 afforded increases of 256 and 250 pounds seed cotton per acre, respectively.

The average increase in seed cotton per acre due to the application of 200 pounds cottonseed meal was 148 pounds; to 240 pounds acid phosphate, 142 pounds; while 120 pounds of alkali salts (equivalent to 200 pounds kainit) gave an average increase of 88 pounds seed cotton per acre.

Cottonseed meal, applied before planting, was about equally as effective as nitrate of soda, applied when the plants were about six inches tall.

E. L. GRAYDON,
(Average all years.)

Averaging the results of the three years of experimental work on these plots, it is seen that Plot 12, receiving a mixture containing 240 pounds acid phosphate, and 100 pounds kainit (or its equivalent in some other potash fertilizer), and 100 pounds nitrate of soda, produced, on the average, an increase of 283 pounds of seed cotton per acre. Plots 5, 9 and 10 produced increases which were about equal. (See table for methods of fertilization.) Their increases ranged from 223 to 231 pounds seed cotton per acre. The three years which are averaged on this experiment show that Plot 12 produced an average profit of \$9.51 per acre. It might be well to add that in 1914, the price used for lint was 6.8 cents per pound; in 1916, 20 cents per pound, and in 1918, 30 cents per pound.

The average increase for the three years attributable to 200 pounds cottonseed meal was 134 pounds of seed cotton per acre; to 240 pounds acid phosphate, 77 pounds; and to potash fertilizers (equivalent to 200 pounds of kainit), 29 pounds seed cotton per acre.

Nitrate of soda, applied when the plants were about six inches tall, gave an increase of 59 pounds more seed cotton per acre than did cottonseed meal, applied before planting.

Experiments in Butler County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	GREENVILLE 1914			GREENVILLE 1916			GREENVILLE* 1918			GREENVILLE Average all Years		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Average yield of seed cotton per acre	Average increase over unfertilized plot	Average profit per acre
1	Lbs. 200	Cotton seed meal	Lbs. 600	Lbs. 296	\$ 3.51	Lbs. 96	Lbs. 80	\$ 2.66	Lbs. 96	Lbs. 40	\$ -1.10	Lbs. 264	Lbs. 105	\$ 1.69
2	240	Acid phosphate	480	176	2.19	48	32	0.36	120	64	4.52	216	91	2.36
3		No fertilizer	304			16			56			125		
4	200	Kainit	456	128	1.42	24	8	-13.38	40	-26	-10.12	173	37	-7.36
5	200	Cotton seed meal	736	384	3.77	88	72	-0.06	312	236	17.94	379	231	7.22
	240	Acid phosphate												
	200	Cotton seed meal												
6	200	Kainit	648	272	1.58	96	80	-11.34	304	218	11.22	349	190	0.49
7		No fertilizer	400			16			96			171		
8	240	Acid phosphate	528	112	-0.62	104	76	-10.25	296	182	10.24	309	123	-0.63
	200	Kainit												
	200	Cotton seed meal												
9	240	Acid phosphate	616	184	-2.03	216	176	-6.05	448	316	19.48	427	225	3.80
	200	Kainit	640	192	1.16	280	228	4.96	400	250	15.85	440	223	7.32
	240	Acid phosphate												
	100	Kainit												
11		No fertilizer	464			64			168			232		
12	240	Acid phosphate	752	288	0.96	368	304	10.56	424	256	17.01	515	283	9.51
	100	Kainit												
	100	Nitrate of soda												

*120 pounds alkali salts used as source of potash instead of 200 pounds kainit in 1918.

Increase in seed cotton per acre due to cottonseed meal, to acid phosphate, to kainit and to nitrate of soda.*

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

	1914	1916	1918	Av.
To unfertilized plot.....	296	80	40	105
To acid phosphate plot.....	208	40	172	140
To kainit plot.....	144	72	244	153
To acid phosphate and kainit plot	72	100	134	102
Average increase with cottonseed meal.....	180	73	148	134

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

To unfertilized plot.....	176	32	64	91
To cottonseed meal plot.....	88	—8	196	92
To kainit plot.....	—16	68	208	87
To cottonseed meal and kainit plot	—88	96	98	39
Average increase with acid phosphate.....	40	47	142	77

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	128	8	—26	37
To cottonseed meal plot.....	—24	0	178	51
To acid phosphate plot.....	—64	44	118	33
To cottonseed meal and acid phosphate plot.....	—200	104	80	—5
Average increase with kainit.....	—40	39	88	29
Increase from use of cottonseed in complete fertilizer.....	72	100	134	102
Increase from use of nitrate of soda.....	168	176	140	161
Nitrate of soda better than cottonseed meal by.....	96	76	6	59

*120 pounds alkali salts were used instead of 200 pounds kainit in 1918.

BUTLER COUNTY, 5 MILES EAST OF GREENVILLE.

W. C. WALTON—1915.

Red sandy loam, with stiffer red subsoil.

The land on which this experiment was conducted had been in oats in 1914; in corn in 1913, which was preceded by cotton. Due to dry weather, the seed which were planted on April 2, did not come up until about May 10. As a whole, the stand was uniform on all plots.

No fertilizer or combination of fertilizers made a very large profit. However, an increase in seed cotton per acre was secured on every plot where fertilizers were applied. The largest profit from fertilizers, \$3.34 per acre, was secured on Plot 10, where the following mixture was use:

200 pounds cottonseed meal per acre
240 pounds acid phosphate per acre
100 pounds kainit per acre.

The average increase due to 200 pounds cottonseed meal was 57 pounds seed cotton per acre; to 240 pounds acid phosphate, 52 pounds seed cotton per acre; and to 200 pounds kainit, 88 pounds seed cotton per acre. One hundred pounds kainit per acre was about equally effective as 200 pounds.

Cottonseed meal was slightly superior to nitrate of soda.

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

To unfertilized plot	64 lbs.
To acid phosphate plot	64 lbs.
To kainit plot	44 lbs.
To acid phosphate and kainit plot	56 lbs.
Average increase with cottonseed meal	57 lbs.

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

To unfertilized plot	4 lbs.
To cottonseed meal plot	4 lbs.
To kainit plot	94 lbs.
To cottonseed meal and kainit plot	106 lbs.
Average increase with acid phosphate	52 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	50 lbs.
To cottonseed meal plot	30 lbs.
To acid phosphate plot	140 lbs.
To cottonseed meal and acid phosphate plot ..	132 lbs.
Average increase with kainit	88 lbs.

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

To use of 200 pounds kainit	132 lbs.
To use of 100 pounds kainit	140 lbs.
Increase from use of cottonseed meal in complete fertilizer	56 lbs.
Increase from use of nitrate of soda	8 lbs.
Cottonseed meal better than nitrate of soda by ..	48 lbs.

Experiments in Butler County

			GREENVILLE 1915			GEORGIANA 1914		
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 ..	288	64	—0.18	1184	224	1.93
2	240	Acid phosphate	288	4	—1.50	1016	56	—0.45
3		No fertilizer	224			960		
4	200	Kainit	280	50	—0.06	1024	58	—0.12
5	200	Cotton seed meal } ..	304	68	—1.69	1056	84	—2.83
	240	Acid phosphate } ..						
6	200	Cotton seed meal } ..	336	94	—1.12	1016	38	—3.56
	200	Kainit						
7		No fertilizer	248			984		
8	240	Acid phosphate	384	144	2.40	1016	8	—2.90
	200	Kainit						
9	200	Cotton seed meal } ..	432	200	1.86	1104	72	—4.50
	240	Acid phosphate } ..						
	200	Kainit						
10	200	Cotton seed meal } ..	432	208	3.34	1168	112	—2.92
	240	Acid phosphate } ..						
	100	Kainit						
11		No fertilizer	216			1080		
12	240	Acid phosphate	376	160	1.23	1264	184	—1.33
	100	Kainit						
	100	Nitrate of soda						

BUTLER COUNTY, 4 MILES WEST OF GEORGIANA.

J. T. PORTER—1914.

Fine gray soil, with yellow stiffer subsoil.

This land had been many years in cultivation. The two preceding crops were cotton, preceded by corn. The stand on all plots was good.

In this dry year no combination of fertilizers and only one fertilizer,—cottonseed meal applied alone—gave an increase large enough to be profitable. The increase due to cottonseed meal alone was 224 pounds of seed cotton per acre, and a profit of \$1.93.

The average increase due to cottonseed meal was 74 pounds seed cotton per acre; while with acid phosphate and with kainit, there was an average loss of 25 pounds and 47 pounds of seed cotton per acre, respectively.

Nitrate of soda, applied June 16, was slightly more effective than was cottonseed meal used before planting.

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

To unfertilized plot	224 lbs.
To acid phosphate plot	28 lbs.
To kainit plot	—20 lbs.
To acid phosphate and kainit plot	64 lbs.
Average increase with cottonseed meal	74 lbs.

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

To unfertilized plot	56 lbs.
To cottonseed meal plot	—140 lbs.
To kainit plot	—50 lbs.
To cottonseed meal and kainit plot	34 lbs.
Average increase with acid phosphate	—25 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	58 lbs.
To cottonseed meal plot	—186 lbs.
To acid phosphate plot	—48 lbs.
To cottonseed meal and acid phosphate plot ..	—12 lbs.
Average increase with kainit	—47 lbs.

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

To use of 200 pounds kainit	—12 lbs.
To use of 100 pounds kainit	28 lbs.
Increase from use of cottonseed meal	64 lbs.
Increase from use of nitrate of soda	136 lbs.
Nitrate of soda better than cottonseed meal by	72 lbs.

CONECUH COUNTY, 11 MILES EAST OF EVERGREEN, NEAR HERBERT.

G. M. HARPER—1915.

Gray sandy loam, with red sandy subsoil.

The soil on which this experiment was located is mapped by the United States Bureau of Soils as Orangeburg Fine Sandy Loam. It originally grew long-leaf pine trees, but had been cleared of this forest growth many years. No legume had grown on this soil for many years. The stand on all plots was injured by cotton wilt, the damage being about uniform.

No fertilizer or combination of fertilizers produced a profit of more than \$2.05 per acre. Increases of 144 and 132 pounds of seed cotton per acre were obtained on Plots 9 and 5, which were fertilized per acre, respectively, as follows:

- 200 pounds cottonseed meal
- 240 pounds acid phosphate
- 200 pounds kainit
- and
- 200 pounds cottonseed meal
- 240 pounds acid phosphate.

The average increase attributable to cottonseed meal was 60 pounds seed cotton per acre; to acid phosphate, 29 pounds; and to kainit, 55 pounds seed cotton per acre.

Nitrate of soda, applied when the plants were about 6 inches high, made an increase of 40 pounds more seed cotton per acre than did cottonseed meal, applied before planting.

G. M. HARPER—1916.

In 1916, Mr. Harper made an experiment with cotton on the same kind of soil on an area which was adjacent to the plots of 1915. This area was planted to a corn experiment in 1915, and was fertilized exactly as the cotton fertilizer plots were fertilized. The stand on all plots was uniform, each being thinned to the same number of plants per plot. The low yields in this experiment are probably due to heavy boll weevil infestation which followed the excessive rains of July 4, 5 and 6.

The only profit recorded in the experiment was on Plot 1, fertilized with cottonseed meal alone at the rate of 200 pounds per acre. Increases in seed cotton per acre of 116 and 112 pounds were obtained from Plots 9 and 1, respectively. The increase on Plot 9 was produced at a financial loss of \$10.67 per acre.

The average increase due to cottonseed meal was 82 pounds seed cotton per acre; to acid phosphate, 15 pounds; while kainit resulted in an average loss of 2 pounds of seed cotton per acre.

Nitrate of soda, applied May 31, was equally as effective as was cottonseed meal, which was applied before planting.

G. M. HARPER—1917.

In 1917, the same experiment was repeated on the same plots as the experiment of 1916. All plots were thinned to the same number of stalks on each. The growing season was favorable to the production of cotton, and only a few boll weevils were present.

The largest increase, 328 pounds seed cotton per acre, and the greatest profit, \$28.92 per acre, were secured from Plot 5, fertilized with a mixture containing:

200 pounds cottonseed meal
240 pounds acid phosphate.

An increase of 272 pounds seed cotton per acre was

secured on Plot 1, where cottonseed meal alone was used at the rate of 200 pounds per acre; also on Plot 12, an increase of 264 pounds seed cotton per acre was made when fertilized per acre with

240 pounds acid phosphate

100 pounds kainit

100 pounds nitrate of soda.

On this soil in 1917 nitrogen was, on the average, the most important element. The average increase attributable to cottonseed meal was 164 pounds seed cotton per acre; to acid phosphate, 73 pounds; while kainit, on the average, resulted in a loss of 28 pounds seed cotton per acre.

Nitrate of soda, applied May 24, was more profitable and produced an increase of 70 pounds more seed cotton per acre than did cottonseed meal, applied before planting.

G. M. HARPER—1918.

In 1918, Mr. Harper conducted the fertilizer experiment with cotton on the same plots as in the preceding two years. The stand was uniform but only fair. Each plot had the same number of stalks as every other plot. Rust is reported as doing some damage on the plots not fertilized with potash fertilizers.

The largest profit, \$28.82 per acre, and the largest increase in seed cotton per acre, 378 pounds, were obtained on Plot 6, fertilized per acre as follows:

200 pounds cottonseed meal

120 pounds alkali salts (equivalent to 200 pounds kainit)

The next largest profit, \$22.89 per acre, and an increase of 314 pounds seed cotton per acre, were obtained on Plot 10, where 200 pounds cottonseed meal, 240 pounds acid phosphate, and 60 pounds alkali salts (equivalent to 100 pounds kainit) were used.

As in 1917, nitrogen was the most important element needed on this soil, and when applied in the form of cottonseed meal at the rate of 200 pounds per acre gave an average increase of 224 pounds seed cotton per acre. Next in importance, on the average, was the potash fertilizer. This year potash was supplied in the form of alkali salts at the rate of 120 pounds per acre and gave an average increase of 150 pounds seed cotton per acre. Acid phosphate when applied at the rate of 240 pounds per acre produced an average increase of 35 pounds seed cotton per acre.

It appears that in this year of much rust damage, potash was very necessary; however, when applied in the form of 60 pounds alkali salts, it produced a better increase in seed cotton per acre by 46 pounds than when applied at double this rate.

Cottonseed meal applied before planting was much more effective than was nitrate of soda, applied May 27.

G. M. HARPER,
(Average all years.)

The table on page 215 shows that the average increase due to the application of 200 pounds cottonseed meal and 240 pounds acid phosphate, gave an increase of 166 pounds of seed cotton per acre at an average profit of \$9.39. Although this is not the largest increase in seed cotton per acre, it is the largest profit.

The average increase attributable to cottonseed meal, in the average of all tests, was 133 pounds seed cotton per acre; to acid phosphate, 38 pounds; and to kainit, or its equivalent in some other potash fertilizer, 44 pounds seed cotton per acre.

Cottonseed meal applied before planting on the average, was about equally as effective as nitrate of soda applied when the plants were about six inches high.

Experiments in Conecuh County by G. M. Harper.

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	HERBERT 1915			HERBERT 1916			HERBERT 1917			HERBERT* 1918			HERBERT Average All Years		
			Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizers	Average yield of seed cotton per acre	Average increase in seed cotton per acre	Average profit per acre
1	200	Cotton seed meal	504	64	-\$0.18	296	112	\$ 5.12	640	272	24.92	888	96	\$ 5.06	582	136	8.73
2	240	Acid phosphate	448	8	-1.33	176	8	-2.72	480	112	10.16	688	-104	-13.96	448	2	-1.96
3		No fertilizer	440			184			368			792			446		
4	200	Kainit	528	98	2.05	136	-36	-16.77	392	36	-10.04	840	54	-1.32	474	38	-6.52
5	200	Cotton seed meal	552	132	1.13	200	40	-2.52	672	328	28.92	944	164	10.02	592	166	9.39
	240	Acid phosphate															
6	200	Cotton seed meal	504	94	-1.12	184	36	-14.73	536	204	3.44	1152	378	28.82	594	178	4.10
	200	Kainit															
7		No fertilizer	400			136			320			768			406		
8	240	Acid phosphate	488	88	-0.07	160	22	-14.41	504	182	3.86	800	62	-2.96	488	89	-3.40
	200	Kainit															
9	200	Cotton seed meal	544	144	-0.60	256	116	-10.67	504	180	-1.36	976	268	14.20	570	177	0.39
	240	Acid phosphate															
10	200	Cotton seed meal	464	64	-2.99	224	82	-6.29	520	194	7.18	992	314	22.89	575	164	5.00
	100	Kainit															
11		No fertilizer	400			144			328			648			380		
12	240	Acid phosphate	504	104	-1.23	224	80	-6.69	592	264	15.88	848	200	10.85	542	162	4.70
	100	Kainit															
	100	Nitrate of soda															

*In 1918, 120 pounds of alkali salts used as source of potash in stead of 200 pounds of kainit.

Increase in seed cotton per acre due to cottonseed meal, to acid phosphate, to kainit and to nitrate of soda.*

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

	1915	1916	1917	1918	Av.
To unfertilized plot	64	112	272	96	136
To acid phosphate plot ..	124	48	216	268	164
To kainit plot	-4	72	168	324	140
To acid phosphate and kainit plot	56	94	-2	206	89
Average increase with cottonseed meal	60	82	164	224	133

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

To unfertilized plot	8	-8	112	-104	2
To cottonseed meal plot ..	68	-7½	56	68	30
To kainit plot	-10	58	146	8	51
To cottonseed meal and kainit plot	50	80	-24	-110	-1
Average increase with acid phosphate	29	15	73	35	38

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	98	-36	36	54	38
To cottonseed meal plot ..	30	-76	-68	282	42
To acid phosphate plot ..	80	30	70	166	87
To cottonseed meal and acid phosphate plot	12	76	-148	104	11
Average increase with kainit*	55	-2	-28	152	44

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

To use of 200 pounds kainit	12	76	-148	104	11
To use of 100 pounds kainit	-68	42	-134	150	-3

Increase from use of cottonseed meal in complete fertilizer

56	94	-2	206	89
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Increase from use of nitrate of soda

96	92	68	92	87
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Cottonseed meal better than nitrate of soda by

-40	2	-70	114	2
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*In 1918, 120 pounds alkali salts per acre used instead of 200 pounds kainit.

CONECUH COUNTY, 1½ MILES SOUTH OF EVERGREEN.

W. F. CHANDLER—1914.

Red sandy loam, with stiffer red subsoil.

This upland soil had been in cultivation many years. Cotton had been the preceding crop for three years.

The land is subject to blight, but no report is made of this disease having done damage.

No fertilizer or combination of fertilizers proved highly profitable on this soil in 1914. However, on Plot 12 an increase of 304 pounds seed cotton per acre and a profit of \$1.31 was obtained from a mixture of

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

Nitrate of soda applied June 2 gave a larger increase by 328 pounds of seed cotton per acre than did cottonseed meal when both were applied in a complete fertilizer.

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

To unfertilized plot	176 lbs.
To acid phosphate plot	—136 lbs.
To kainit plot	—88 lbs.
To acid phosphate and kainit plot	—24 lbs.
Average increase with cottonseed meal	—18 lbs.

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

To unfertilized plot	96 lbs.
To cottonseed meal plot	—216 lbs.
To kainit plot	—148 lbs.
To cottonseed meal and kainit plot	—84 lbs.
Average increase with acid phosphate	—88 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	12 lbs.
To cottonseed meal plot	—252 lbs.
To acid phosphate plot	—232 lbs.
To cottonseed meal and acid phosphate plot	—120 lbs.
Average increase with kainit	—148 lbs.

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

To use of 200 pounds kainit	—120 lbs.
To use of 100 pounds kainit	16 lbs.

Increase from use of cottonseed meal in complete fertilizer

.....	—24 lbs.
-------	----------

Increase from use of nitrate of soda

.....	304 lbs.
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Nitrate of soda better than cottonseed meal by ..	328 lbs.
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Experiments in Conecuh and Escambia Counties

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	EVERGREEN 1914			NOKOMIS 1914		
			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	912	176	0.87	664	16	-2.65
2	240	Acid phosphate	832	96	0.43	664	16	-1.33
3		No fertilizer	736			648		
4	200	Kainit	720	12	-1.14	816	160	2.12
5	200	Cotton seed meal	640	-40	-5.56	828	164	-1.07
	240	Acid phosphate						
6	200	Cotton seed meal	576	-76	-6.07	904	232	0.70
	200	Kainit						
7		No fertilizer	624			680		
8	240	Acid phosphate	512	-136	-6.07	848	168	0.62
	200	Kainit						
9	200	Cotton seed meal	512	-160	-9.60	944	264	-0.27
	240	Acid phosphate						
10	200	Cotton seed meal	672	-24	-5.91	888	208	-0.80
	240	Acid phosphate						
11	100	Kainit	720			680		
		No fertilizer						
12	240	Acid phosphate	1024	304	1.31	984	304	1.31
	100	Kainit						
	100	Nitrate of soda						

ESCAMBIA COUNTY, 1 MILE EAST OF NOKOMIS.

N. B. RHODES, ON THE FARM OF H. W. CURRIE—1914.

Gray sandy soil, with stiffer red subsoil.

The land on which this experiment was conducted had been in cultivation for the past fifteen years. Long-leaf pine was the original forest growth. Corn was grown on the land in 1913, cotton in 1912 and corn in 1911. A uniform stand was secured on all plots. Plot 12, receiving 240 pounds acid phosphate, 100 pounds kainit, and 100 pounds nitrate of soda (applied late) made an increase of 304 pounds seed cotton per acre, at a profit of \$1.31 per acre. The next largest increase was on Plot 9, which received an application of

200 pounds cottonseed meal
240 pounds acid phosphate
200 pounds kainit.

The increase in this plot was 264 pounds seed cotton

per acre, but it resulted in a financial loss of 27 cents per acre. Kainit when applied alone on Plot 4, at the rate of 200 pounds per acre, gave a profit of \$2.12 per acre, although the increase in seed cotton was only 160 pounds per acre.

An analysis showing the value of the different fertilizers shows that potash in the form of kainit was more important on this soil than was either nitrogen or phosphate. Kainit when applied at the rate of 200 pounds per acre gave an increase of 157 pounds of seed cotton per acre. Cottonseed meal applied at the rate of 200 pounds per acre gave an increase of 83 pounds seed cotton per acre. Acid phosphate when applied at the rate of 240 pounds per acre gave an increase of 51 pounds seed cotton per acre. Two hundred pounds of kainit gave an increase per acre of more than double that secured when only 100 pounds were applied.

Nitrate of soda applied May 28 was more effective and more profitable by 96 pounds seed cotton per acre than its equivalent amount of cottonseed meal applied before planting.

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

To unfertilized plot	16 lbs.
To acid phosphate plot	148 lbs.
To kainit plot	72 lbs.
To acid phosphate and kainit plot	96 lbs.
Average increase with cottonseed meal	83 lbs.

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

To unfertilized plot	16 lbs.
To cottonseed meal plot	148 lbs.
To kainit plot	8 lbs.
To cottonseed meal and kainit plot	32 lbs.
Average increase with acid phosphate	51 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	160 lbs.
To cottonseed meal plot	216 lbs.
To acid phosphate plot	152 lbs.
To cottonseed meal and acid phosphate plot ..	100 lbs.
Average increase with kainit	157 lbs.

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

To use of 200 pounds kainit	100 lbs.
To use of 100 pounds kainit	44 lbs.
Increase from use of cottonseed meal	96 lbs.
Increase from use of nitrate of soda	192 lbs.
Nitrate of soda better than cottonseed meal by ..	96 lbs.

CRENSHAW COUNTY, $\frac{1}{2}$ MILE NORTH OF
BRANTLEY.

A. C. CAUSEY—1914.

Dark gray sandy soil, with yellow sandy subsoil.

This experiment was made on a soil which had been cleared of its original forest growth of oak, pine and hickory for about fifteen years. Cotton had preceded the experiment for at least three years. The land is subject to cotton wilt, but little or no damage was done in 1914. The stand was good on all plots.

In this dry year no fertilizer or combination of fertilizers proved very profitable. However, an increase of 302 pounds seed cotton per acre, produced at a profit of \$2.24 per acre, was made on Plot 6, fertilized with cottonseed meal and kainit at the rate of 200 pounds each. This plot, however, did not produce the largest profit.

The experiment indicates that in 1914, potash was badly needed on this soil, and nitrogen was needed to a less extent. The average increase due to 200 pounds kainit was 177 pounds seed cotton per acre, and to 200 pounds cottonseed meal, 70 pounds seed cotton per acre. Two hundred pounds kainit was more effective on this soil than was 100 pounds.

Nitrate of soda produced 144 pounds seed cotton per acre more than did cottonseed meal, each being applied in a complete fertilizer.

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

To unfertilized plot	264 lbs.
To acid phosphate plot	—84 lbs.
To kainit plot	84 lbs.
To acid phosphate and kainit plot	14 lbs.
Average increase with cottonseed meal	70 lbs.

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

To unfertilized plot	32 lbs.
To cottonseed meal plot	—316 lbs.
To kainit plot	—10 lbs.
To cottonseed meal and kainit plot	—80 lbs.
Average increase with acid phosphate	—94 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	218 lbs.
To cottonseed meal plot	38 lbs.
To acid phosphate plot	176 lbs.
To cottonseed meal and acid phosphate plot ..	274 lbs.
Average increase with kainit	177 lbs.

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

To use of 200 pounds kainit	274 lbs.
To use of 100 pounds kainit	196 lbs.
Increase from use of cottonseed meal	14 lbs.
Increase from use of nitrate of soda	158 lbs.
Nitrate of soda better than cottonseed meal by ..	144 lbs.

Experiments in Crenshaw County

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	BRANTLEY 1914			BRANTLEY 1915		
			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	1000	264	2.81	576	-152	-9.69
2	240	Acid phosphate	768	32	-0.98	728	0	-1.68
3		No fertilizer	736			728		
4	200	Kainit	968	218	3.40	728	10	-1.82
5	200	Cotton seed meal	712	-52	-3.54	928	220	5.00
	240	Acid phosphate						
6	200	Cotton seed meal	1080	302	2.24	936	238	5.21
	200	Kainit						
7		No fertilizer	792			688		
8	240	Acid phosphate	960	208	-1.50	856	160	3.10
	200	Kainit						
9	200	Cotton seed meal	936	222	-1.20	984	280	5.38
	240	Acid phosphate						
10	200	Kainit	816	144	-2.21	1008	296	7.21
	240	Acid phosphate						
11	100	Kainit	632			720		
12		No fertilizer	920	288	0.96	1056	336	8.97
	240	Acid phosphate						
	100	Nitrate of soda						

A. C. CAUSEY—1915.

The same experiment was made by Mr. Causey in 1915, on different plots but on a similar soil. Corn was the preceding crop, and it was preceded by cotton. The stand was good on all plots. Boll weevils did some damage. The results show that Plot 12 gave a profit of \$8.97 per acre, with an increase of 336 pounds seed cotton per acre. This plot was fertilized per acre with

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

The next largest profit, \$7.21 per acre, and the second largest increase in seed cotton per acre, 296 pounds, was obtained from Plot 10, fertilized as follows:

200 pounds cottonseed meal per acre
240 pounds acid phosphate per acre
100 pounds kainit per acre.

The average increase due to kainit in 1915, as in 1914, was much larger than the average increases due to other fertilizers. This year it was 155 pounds seed cotton per acre; while acid phosphate and cottonseed meal gave average increases of 141 pounds and 104 pounds, respectively.

Nitrate of soda, as in 1914, was more effective than cottonseed meal.

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

To unfertilized plot	152 lbs.
To acid phosphate plot	220 lbs.
To kainit plot	228 lbs.
To acid phosphate and kainit plot	120 lbs.
Average increase with cottonseed meal	104 lbs.

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

To unfertilized plot	0 lbs.
To cottonseed meal plot	372 lbs.
To kainit plot	150 lbs.
To cottonseed meal and kainit plot	42 lbs.
Average increase with acid phosphate	141 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	10 lbs.
To cottonseed meal plot	390 lbs.
To acid phosphate plot	160 lbs.
To cottonseed meal and acid phosphate plot ..	60 lbs.
Average increase with kainit	155 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	76 lbs.

Increase from use of cottonseed meal in complete fertilizer

120 lbs.

Increase from use of nitrate of soda

160 lbs.

Nitrate of soda better than cottonseed meal by ..

40 lbs.

PIKE COUNTY, 8 MILES SOUTH OF TROY.

H. W. AND T. V. BALLARD—1914.

Red sandy loam, with stiffer red subsoil.

This experiment was located on land which grew cotton in 1913. The preceding crop, according to Mr. Ballard, was rather heavily fertilized with a mixture containing one-third cottonseed meal and two-thirds acid phosphate.

No fertilizer or combination of fertilizers proved highly profitable on this soil in 1914. Increases of 174 pounds seed cotton per acre, and 168 pounds seed cotton per acre were received from Plots 4 and 8, respectively.

The average increase due to 200 pounds cottonseed meal was 24 pounds seed cotton per acre; to 240 pounds acid phosphate, 25 pounds; and to 200 pounds kainit, 75 pounds seed cotton per acre.

Nitrate of soda was more effective than was an equivalent amount of cottonseed meal.

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

To unfertilized plot	104 lbs.
To acid phosphate plot	44 lbs.
To kainit plot	-20 lbs.
To acid phosphate and kainit plot	-32 lbs.
Average increase with cottonseed meal	24 lbs.

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

To unfertilized plot	136 lbs.
To cottonseed meal plot	-12 lbs.
To kainit plot	-6 lbs.
To cottonseed meal and kainit plot	-18 lbs.
Average increase with acid phosphate	25 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	174 lbs.
To cottonseed meal plot	50 lbs.
To acid phosphate plot	32 lbs.
To cottonseed meal and acid phosphate plot ..	44 lbs.
Average increase with kainit	75 lbs.

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

To use of 200 pounds kainit	44 lbs.
To use of 100 pounds kainit	-60 lbs.
Increase from use of nitrate of soda	40 lbs.

Experiments in Pike and Barbour Counties

			TROY 1914			EUFULA 1915		
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	200	Cotton seed meal	472	104	0.71	328	168	4.39
2	240	Acid phosphate	504	136	1.31	216	56	0.78
3		No fertilizer	368			160		
4	200	Kainit	552	174	2.43	192	36	-0.68
5	200	Cotton seed meal	480	92	-2.66	248	96	-0.46
	240	Acid phosphate						
6	200	Cotton seed meal	552	154	-1.01	432	284	7.24
	200	Kainit						
7		No fertilizer	408			144		
8	240	Acid phosphate	568	168	0.62	368	220	5.74
	200	Kainit						
9	200	Cotton seed meal	528	136	-3.09	320	168	0.45
	240	Acid phosphate						
10	200	Cotton seed meal	416	32	-4.68	448	292	7.04
	240	Acid phosphate						
11	100	Kainit						
12	200	Cotton seed meal	376			160		
	240	Acid phosphate						
	100	Kainit						
12	100	Kainit	480	104	-3.09	480	320	8.27
	100	Nitrate of soda						

BARBOUR COUNTY, 2 MILES NORTH OF EUFAULA.

L. B. GREENE—1915.

Gray sandy soil, with yellow sandy subsoil.

The land on which this experiment was conducted had been in cultivation fifty years or more. Cotton had been the preceding crop for many years. As shown by the yields of the check plots the land was very poor.

The largest profit from fertilizers, \$8.27 per acre, also the largest increase, 320 pounds of seed cotton per acre, were secured on Plot 12 which was fertilized with the following:

- 100 pounds nitrate of soda per acre
- 240 pounds acid phosphate per acre
- 100 pounds kainit per acre.

The next largest profit, \$7.24 per acre, and an increase of 284 pounds of seed cotton per acre were secured from Plot 6, fertilized with

200 pounds cottonseed meal per acre

200 pounds kainit per acre.

The average increase in seed cotton per acre due to cottonseed meal was 101 pounds; to acid phosphate, only 13 pounds per acre; and to kainit, 97 pounds per acre.

Nitrate of soda made a better yield than an equivalent amount of cottonseed meal by 28 pounds of seed cotton per acre.

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

To unfertilized plot	168 lbs.
To acid phosphate plot	40 lbs.
To kainit plot	248 lbs.
To acid phosphate and kainit plot	—52 lbs.
Average increase with cottonseed meal	101 lbs.

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

To unfertilized plot	56 lbs.
To cottonseed meal plot	—72 lbs.
To kainit plot	184 lbs.
To cottonseed meal and kainit plot	—116 lbs.
Average increase with acid phosphate	13 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	36 lbs.
To cottonseed meal plot	116 lbs.
To acid phosphate plot	164 lbs.
To cottonseed meal and acid phosphate plot ..	72 lbs.
Average increase with kainit	97 lbs.

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

To use of 200 pounds kainit	72 lbs.
To use of 100 pounds kainit	196 lbs.

DALE COUNTY, 2½ MILES NORTHEAST OF OZARK

A. L. CARR—1915.

Light colored sandy soil, with yellowish stiffer sandy subsoil.

The land on which this experiment was conducted had been cleared five years. Corn grew on the soil in 1915, and cotton, the two preceding years. The experiment was planted rather late for this section (May 7.) This late planting may have affected the yields of the different plots.

The largest profit received, \$4.25 per acre, was secured on Plot 4, which received kainit alone. However, Plot 5, receiving 200 pounds cottonseed meal and 240 pounds acid phosphate; and Plot 6, fertilized with

200 pounds cottonseed meal and 200 pounds kainit, each made a larger increase than the plot receiving kainit alone, although the profit was smaller.

The average increase attributable to the application of 200 pounds cottonseed meal per acre was 20 pounds seed cotton; to 240 pounds acid phosphate, 14 pounds seed cotton per acre; while the average increase due to the application of 200 pounds kainit was 90 pounds seed cotton per acre.

Cottonseed meal and nitrate of soda were about equally effective when applied in complete fertilizers.

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

To unfertilized plot	—88 lbs.
To acid phosphate plot	152 lbs.
To kainit plot	8 lbs.
To acid phosphate and kainit plot	8 lbs.
Average increase with cottonseed meal	20 lbs.

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

To unfertilized plot	0 lbs.
To cottonseed meal plot	240 lbs.
To kainit plot	—92 lbs.
To cottonseed meal and kainit plot	—92 lbs.
Average increase with acid phosphate	14 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	148 lbs.
To cottonseed meal plot	244 lbs.
To acid phosphate plot	56 lbs.
To cottonseed meal and acid phosphate plot	—88 lbs.
Average increase with kainit	90 lbs.

Increase from use of cottonseed meal in complete fertilizer	8 lbs.
Increase from use of nitrate of soda	16 lbs.
Nitrate of soda better than cottonseed meal by ..	8 lbs.

Experiments in Dale County

			OZARK 1915			OZARK 1914		
Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fer- tilizer	Yield seed cotton per acre	Increase over unfertilized plot	Profit from fertilizer
	Lbs.		Lbs.	Lbs.	\$	Lbs.	Lbs.	\$
1	200	Cotton seed meal	88	-88	-6.87	280	136	-0.01
2	240	Acid phosphate	176	0	-1.68	344	200	2.72
3		No fertilizer	176			144		
4	200	Kainit	336	148	4.25	176	40	-0.52
5	200	Cotton seed meal	352	152	2.01	544	416	4.47
	240	Acid phosphate						
6	200	Cotton seed meal	368	156	1.60	288	168	-0.70
	200	Kainit						
7		No fertilizer	224			112		
8	240	Acid phosphate	304	56	-1.48	304	180	0.88
	200	Kainit						
9	200	Cotton seed meal	336	64	-4.12	448	312	0.78
	240	Acid phosphate						
10	200	Kainit	352	56	-3.35	512	364	2.63
	240	Acid phosphate						
11	100	Kainit	320			160		
	240	No fertilizer						
12	240	Acid phosphate	384	64	-2.99	224	64	-3.97
	100	Kainit						
	100	Nitrate of soda						

DALE COUNTY, $\frac{3}{4}$ MILE SOUTH OF OZARK.

J. W. BYRD—1914.

Gray sandy soil, with stiffer subsoil.

This old upland field had been in cultivation for 50 or more years. Some damage was done by cotton wilt, but Mr. Byrd reported that about the same number of stalks were killed on each plot.

The largest increase, 364 pounds of seed cotton per acre, was afforded by Plot 10, fertilized with a complete fertilizer in which the kainit was reduced to 100 pounds per acre.

The average increase attributable to cottonseed meal was 153 pounds of seed cotton per acre; to acid phosphate, 191 pounds; while with kainit there was a decrease in the yield.

Cottonseed meal was superior to nitrate of soda.

A similar experiment to this one was conducted by Mr. Byrd in 1911, 1912 and 1913. The average increases due to cottonseed meal, to acid phosphate and to kainit in four different combinations, each year, are shown below:

	1911	1912	1913	1914	Av.
200 pounds cottonseed meal -----	222	280	95	153	188
240 pounds acid phosphate -----	141	148	105	191	146
200 pounds kainit -----	254	180	141	—13	116
200 pounds cottonseed meal better than 100 pounds of nitrate of soda by -----	41	32	111	300	66

On the whole, cottonseed meal has been first in importance, phosphate second, and kainit a close third.

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

To unfertilized plot -----	136 lbs.
To acid phosphate plot -----	216 lbs.
To kainit plot -----	128 lbs.
To acid phosphate and kainit plot -----	132 lbs.
Average increase with cottonseed meal ----	153 lbs.

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

To unfertilized plot -----	200 lbs.
To cottonseed meal plot -----	280 lbs.
To kainit plot -----	140 lbs.
To cottonseed meal and kainit plot -----	144 lbs.
Average increase with acid phosphate -----	191 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot -----	40 lbs.
To cottonseed meal plot -----	32 lbs.
To acid phosphate plot -----	—20 lbs.
To cottonseed meal and acid phosphate plot ----	—104 lbs.
Average increase with kainit -----	—13 lbs.

HENRY COUNTY, $\frac{3}{4}$ MILE SOUTH OF HEADLAND.

M. A. CREEL—1916.

Gray sandy soil, with few gravel in it, with stiffer subsoil.

In 1915, cotton was grown on this land, corn in 1914 and corn in 1913. It had been cleared about eighteen years. All plots in the test were thinned to the same number of stalks on each.

Although the excessive rains of this year were followed by heavy infestation of boll weevils in this section, a profit of \$14.11 per acre was secured on Plot 5 when an application of 200 pounds cottonseed meal and

240 pounds acid phosphate per acre was used. In this wet year when boll weevils were present in great numbers after the first week of July, an average increase of 79 pounds seed cotton was secured when cottonseed meal was used at the rate of 200 pounds per acre before planting. The average increase due to 240 pounds acid phosphate was 16 pounds seed cotton per acre; while with kainit there was a loss of 45 pounds seed cotton per acre when 200 pounds of this fertilizer was used.

Nitrate of soda applied June 15 was slightly less effective when used in a complete fertilizer than was an equivalent amount of cottonseed meal.

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

To unfertilized plot	200 lbs.
To acid phosphate plot	120 lbs.
To kainit plot	32 lbs.
To acid phosphate and kainit plot	-38 lbs.
Average increase with cottonseed meal	79 lbs.

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

To unfertilized plot	136 lbs.
To cottonseed meal plot	56 lbs.
To kainit plot	-30 lbs.
To cottonseed meal and kainit plot	-100 lbs.
Average increase with acid phosphate	16 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	120 lbs.
To cottonseed meal plot	-48 lbs.
To acid phosphate plot	-46 lbs.
To cottonseed meal and acid phosphate plot	-204 lbs.
Average increase with kainit	-45 lbs.

Experiments in Henry and Houston Counties

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	HEADLAND 1916			HEADLAND 1915		
			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. 496	Lbs. 200	\$ 11.90	Lbs. 1152	Lbs. —48	\$ —5.11
2	240	Acid phosphate	432	136	8.37	1248	48	0.43
3		No fertilizer	296			1200		
4	200	Kainit	424	120	—4.76	1088	—96	—6.48
5	200	Cotton seed meal	568	256	14.11	1312	144	1.66
	240	Acid phosphate						
6	200	Cotton seed meal	472	152	—5.80	1104	—48	—7.37
	200	Kainit						
7		No fertilizer	328			1136		
8	240	Acid phosphate	408	90	—9.17	1344	232	6.27
	200	Kainit						
9	200	Cotton seed meal	360	52	—15.60	1408	320	7.14
	240	Acid phosphate						
10	200	Cotton seed meal	432	134	—2.28	1056	—8	—6.16
	240	Acid phosphate						
11	100	Kainit	288			1040		
		No fertilizer						
12	240	Acid phosphate	408	120	—3.61	1360	320	8.27
	100	Nitrate of soda						

HOUSTON COUNTY, 3½ MILES SOUTH OF
HEADLAND.

D. C. JARVIS—1915.

Yellowish-gray sandy loam, with stiffer yellow subsoil.

The land on which this experiment was conducted had been in cultivation only six years, and had grown cotton during the past three years. Due to a hard storm which came just after the plants were coming up, it was necessary to plant this cotton over. The second planting came rather late for this section (May 10.)

The largest profit, \$8.27 per acre, was secured when a complete fertilizer containing 100 pounds nitrate of soda, 240 pounds acid phosphate and 100 pounds kainit was used on Plot 12, although an equal increase in seed cotton was secured when a higher priced combi-

nation of fertilizer containing 200 pounds cottonseed meal, 240 pounds acid phosphate and 200 pounds kainit was used on Plot 9.

The average increase due to 200 pounds cottonseed meal per acre on this experiment was 46 pounds seed cotton per acre; to 240 pounds acid phosphate, 234 pounds seed cotton per acre; and to 200 pounds kainit, 66 pounds seed cotton per acre.

The figures from Plots 10, 11 and 12 suggest that there may have been some undiscovered conditions depressing the yield of one or more of these plots and prevent the drawing of any conclusion regarding the relative values of cottonseed meal and nitrate of soda and the relative effects of different amounts of kainit.

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

To unfertilized plot	—48 lbs.
To acid phosphate plot	96 lbs.
To kainit plot	48 lbs.
To acid phosphate and kainit plot	88 lbs.
Average increase with cottonseed meal	46 lbs.

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

To unfertilized plot	48 lbs.
To cottonseed meal plot	192 lbs.
To kainit plot	328 lbs.
To cottonseed meal and kainit plot	368 lbs.
Average increase with acid phosphate	234 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	—96 lbs.
To cottonseed meal plot	0 lbs.
To acid phosphate plot	184 lbs.
To cottonseed meal and acid phosphate plot	176 lbs.
Average increase with kainit	66 lbs.

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

To use of 200 pounds kainit	176 lbs.
To use of 100 pounds kainit	152 lbs.
Increase from use of cottonseed meal in complete fertilizer	88 lbs.
Increase from use of nitrate of soda	416 lbs.
Nitrate of soda better than cottonseed meal by ..	328 lbs.

HENRY COUNTY, 1½ MILES NORTHWEST OF HEADLAND.

C. F. WILKERSON—1915.

Reddish sandy loam, with stiffer red subsoil.

Corn with velvet beans, was grown on this land in 1914; cotton preceded these crops for two years. The

land had been cleared of the original forest growth approximately thirty years.

In this dry year no fertilizer or combination of fertilizers produced a profit on this cotton planted May 14, although increases of 124 and 112 pounds seed cotton per acre were secured on Plots 9 and 12, respectively. Plot 9 received, per acre, 200 pounds cottonseed meal, 240 pounds acid phosphate and 200 pounds kainit; while Plot 12 received 240 pounds acid phosphate, 100 pounds kainit and 100 pounds nitrate of soda, (nitrate applied late—about July 1.)

On this level uniform land cottonseed meal, acid phosphate and kainit were, on the average, about equally effective.

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

To unfertilized plot	40 lbs.
To acid phosphate plot	32 lbs.
To kainit plot	48 lbs.
To acid phosphate and kainit plot	62 lbs.
Average increase with cottonseed meal	46 lbs.

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

To unfertilized plot	16 lbs.
To cottonseed meal plot	8 lbs.
To kainit plot	58 lbs.
To cottonseed meal and kainit plot	72 lbs.
Average increase with acid phosphate	39 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	4 lbs.
To cottonseed meal plot	12 lbs.
To acid phosphate plot	46 lbs.
To cottonseed meal and acid phosphate plot ..	76 lbs.
Average increase with kainit	35 lbs.

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

To use of 200 pounds kainit	76 lbs.
To use of 100 pounds kainit	50 lbs.
Increase from use of cottonseed meal in complete fertilizer	62 lbs.
Increase from use of nitrate of soda	76 lbs.
Nitrate of soda better than cottonseed meal by ..	14 lbs.

Experiments in Henry and Sumter Counties

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	HEADLAND 1915			CUBA* 1918		
			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	368	40	-1.24	936	120	7.70
2	240	Acid phosphate	344	16	-0.98	848	32	1.00
3		No fertilizer	328			816		
4	200	Kainit	328	4	-2.08	896	110	4.84
5	200	Cotton seed meal	368	48	-2.57	824	68	-0.54
	240	Acid phosphate						
6	200	Cotton seed meal	368	52	-2.97	904	178	6.82
	200	Kainit						
7		No fertilizer	312			696		
8	240	Acid phosphate	376	62	-1.21	872	150	6.72
	200	Kainit						
9	200	Cotton seed meal	440	124	-1.48	984	236	10.68
	240	Acid phosphate						
10	200	Kainit	416	98	-1.50	952	178	7.93
	240	Cotton seed meal						
11	100	Kainit	320			800		
		No fertilizer						
12	240	Acid phosphate	432	112	-0.88	1008	208	11.73
	100	Kainit						
	100	Nitrate of soda						

*120 pounds alkali salts used instead of 200 pounds of kainit as source of potash.

SUMTER COUNTY, ½ MILE NORTH OF CUBA.

W. H. STEPHENS—1918.

Gray fine sandy loam, with fine yellow sandy subsoil.

The land on which this experiment was located was mapped by the United States Bureau of Soils as Norfolk Fine Sandy Loam. It had been in cultivation many years. No legume had recently grown where the experiment was located. Alkali salts at the rate of 120 pounds per acre were used instead of 200 pounds kainit.

The largest profit, \$11.73 per acre, and an increase of 208 pounds seed cotton per acre were secured from Plot 12, fertilized as follows:

240 pounds acid phosphate

60 pounds alkali salts (equivalent to 100 pounds kainit) —
100 pounds nitrate of soda.

The largest increase in seed cotton per acre, 236 pounds, obtained at a profit of \$10.68 per acre was made on Plot 9 where the following application was used:

200 pounds cottonseed meal
240 pounds acid phosphate
120 pounds alkali salts (equivalent to 200 pounds kainit).

On this soil in 1918 it appears that potash was badly needed. The average increase due to potash in the form of alkali salts was 114 pounds seed cotton per acre; to cottonseed meal, 78 pounds; while with acid phosphate the average increase was only 20 pounds.

Potash when applied in the form of alkali salts at the rate of 200 pounds per acre gave 58 more pounds seed cotton per acre than did the same fertilizer applied at one-half the usual rate.

Nitrate of soda applied when the plants were about six inches tall was more effective by 30 pounds seed cotton per acre than cottonseed meal, applied before planting.

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

To unfertilized plot	120 lbs.
To acid phosphate plot	36 lbs.
To kainit plot	68 lbs.
To acid phosphate and kainit plot	86 lbs.
Average increase with cottonseed meal	78 lbs.

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

To unfertilized plot	32 lbs.
To cottonseed meal plot	—52 lbs.
To kainit plot	40 lbs.
To cottonseed meal and kainit plot	58 lbs.
Average increase with acid phosphate	20 lbs.

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	110 lbs.
To cottonseed meal plot	58 lbs.
To acid phosphate plot	118 lbs.
To cottonseed meal and acid phosphate plot ..	168 lbs.
Average increase with kainit	114 lbs.

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

To use of 200 pounds kainit	168 lbs.
To use of 100 pounds kainit	110 lbs.

Increase from use of cottonseed meal in complete fertilizer -----	86 lbs.
Increase from use of nitrate of soda -----	116 lbs.
Nitrate of soda better than cottonseed meal by ..	30 lbs.

INCONCLUSIVE EXPERIMENTS.

In SUMTER COUNTY, an experiment conducted by W. H. Stephens, one-half mile North of Cuba in 1914, proved inconclusive because of lack of uniformity of the soil as shown by the check plots. (See page 236.)

In GREENE COUNTY, an experiment conducted by J. A. Dees, 6 miles west of Eutaw in 1914, proved inconclusive because of poor stand. In 1915, a similar experiment conducted by Mr. Dees proved inconclusive. (See page 236.)

In CHOCTAW COUNTY, in 1914, an experiment conducted by J. L. Covington, 6 miles South of Lisman proved inconclusive. (See page 236.) Also see Alabama Station Bulletin, No. 174—page 165, for 1913 results on same plots.)

In MARENGO COUNTY, in 1918, an experiment conducted by W. C. Harrison on a reddish fine sandy soil near Gallion proved inconclusive because the area had been fertilized with barnyard manure in recent years. (See page 236.)

In DALLAS COUNTY, in 1914, an experiment conducted by C. Kirkpatrick at Cahaba, on Norfolk fine sandy loam soil, proved inconclusive because of lack of uniformity in soil as indicated by the check plots. (See page 236.)

In AUTAUGA COUNTY, an experiment which was made by W. G. Pickett, near Autaugaville, in 1915, proved inconclusive because the fertilizers were not properly applied. (See page 236.)

In AUTAUGA COUNTY, in 1915, W. A. Wadsworth conducted an experiment near Prattville, on gray fine sandy loam with brownish red fine sandy subsoil. The results were inconclusive. (See page 236.)

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	CUBA 1914		EUTAW 1914		EUTAW 1915		LISMAN 1914		GALLION* 1918		CAHABA 1914		AUTAUGA-VILLE, 1915		PRATTVILLE 1915	
			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	Yield seed cotton per acre	Increase over unfertilized plot	Yield seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal	Lbs. 1032	Lbs. 112	Lbs. 432	Lbs. 24	Lbs. 320	Lbs. 80	Lbs. 440	Lbs. 64	Lbs. 1592	Lbs. 48	Lbs. 608	Lbs. 184	Lbs. 568	Lbs. 200	Lbs. 832	Lbs. 136
2	240	Acid phosphate	936	16	384	24	240	0	480	24	1633	89	480	56	440	72	912	216
3		No fertilizer	920		408		240		504		1544		424		368		696	
4	200	Kainit	1024	118	376	14	256	16	488	10	1374	113	480	72	424	42	736	36
5	200	Cotton seed meal	1104	212	424	52	288	48	680	228	1238	193	536	144	544	148	928	224
	240	Acid phosphate																
6	200	Cotton seed meal	1136	285	480	126	288	48	480	54	1198	177	464	88	584	174	592	116
	200	Kainit																
7		No fertilizer	864		336		240		400		1319		360		424		712	
8	240	Acid phosphate	1096	152	448	86	272	32	640	266	1258	71	416	102	464	32	776	4
	200	Kainit																
9	200	Cotton seed meal	1184	160	600	212	336	96	544	196	1279	60	400	132	616	176	752	80
	240	Acid phosphate																
10	200	Cotton seed meal	1240	136	608	194	352	112	456	134	1388	39	416	194	536	88	760	132
	240	Acid phosphate																
11	100	Kainit	1184		440		240		296		1360		176		456		952	
		No fertilizer																
12	240	Acid phosphate	1240	56	608	168	368	128	480	184	973	387	640	464	504	48	680	272
	100	Kainit																
	100	Nitrate of soda																

*In 1918, alkali salts used as source of potash.

In ELMORE COUNTY, O. C. Johnson conducted an experiment 1 mile South of Eclectic in 1914. The results are inconclusive because of irregularity of the soil as shown by the check plots. (See page 238.)

In BULLOCK COUNTY, in 1915, an experiment was conducted by S. P. Rainer, Jr., 3½ miles East of Union Springs, on a gray sandy soil, with yellow sandy subsoil. This experiment proved inconclusive because of lack of uniformity in the soil as shown by the check plots. (See page 238.)

In CRENSHAW COUNTY, an experiment was conducted in 1914 by F. L. Hawkins, one mile East of Luverne. It proved inconclusive because of lack of uniformity of the soil. (See page 238.)

In PIKE COUNTY, an experiment conducted by T. H. Curtis in 1914, 4 miles South of Troy, was inconclusive because of lack of uniformity of the soil. (See page 238.)

In ESCAMBIA COUNTY, 1 mile Southeast of Brewton, an experiment conducted by J. E. Tippen in 1914, proved inconclusive because of lack of uniformity of the land. (See page 238.)

In COFFEE COUNTY, an experiment conducted by T. P. Windham, Elba, in 1916, proved inconclusive because of damages done by boll weevils after excessive rains in July. (See page 238.)

In GENEVA COUNTY, an experiment was conducted in 1914, by the Geneva County High School, B. H. Boyd, Principal. It proved inconclusive because the land on which the experiment was conducted was not uniform. However, every combination of fertilizers gave an increase. On Plot 10, where a mixture containing 200 pounds cottonseed meal, 240 pounds acid phosphate, and 100 pounds kainit was applied per acre an increase of 728 pounds of seed cotton was secured. (See page 238.)

In HENRY COUNTY, 2 miles East of Abbeville in 1914, an experiment conducted by J. B. Espy, proved inconclusive because of poor stand. However, the results show that on this land an application of complete fertilizer, in which nitrate of soda was used as a source of nitrogen, was most effective. (See page 238.)

Plot No.	Amt. fertilizer per acre	KIND OF FERTILIZER	ECLECTIC 1914		UNION SPRINGS 1915		LIVERNE 1914		TROY 1914		BREWTON 1914		ELBA* 1916		HARTFORD 1914		ABBEVILLE 1914	
			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	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.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	200	Cotton seed meal	880	64	440	88	784	168	392	136	320	144	16	0	1056	280	424	96
2	240	Acid phosphate	656	-160	376	24	664	48	320	64	192	12	64	48	1384	608	424	96
3		No fertilizer	816		352		616		256		176		15		776		328	
4	200	Kainit	992	220	360	30	704	28	528	88	176	-16	8	-8	816	-28	456	130
5	200	Cotton seed meal	1184	456	536	228	912	176	368	-256	336	128	32	16	1464	552	432	108
5	240	Acid phosphate																
6	200	Cotton seed meal	1044	360	432	146	1112	316	392	-416	288	64	8	-8	1144	164	608	286
6	200	Kainit																
7		No fertilizer	640		264		856		992		240		16		1048		320	
8	240	Acid phosphate	976	236	384	146	928	96	856	-38	336	36	16	3	1504	440	448	123
8	200	Kainit																
9	240	Cotton seed meal	1280	440	272	60	1008	200	752	-44	512	152	16	6	1672	592	576	247
9	200	Acid phosphate																
10	200	Cotton seed meal	1216	276	544	358	1056	272	672	-26	672	252	8	1	1824	728	608	274
10	240	Acid phosphate																
11	100	Kainit	1040		160		760		600		480		4		1112		338	
12	240	Acid phosphate	1344	304	352	192	1192	432	488	-112	672	192	4	0	1720	608	704	366
12	100	Kainit																
12	100	Nitrate of soda																

*In 1916, 50 pounds muriate of potash used instead of 200 pounds kainit as source of potash.

In WASHINGTON COUNTY in 1914, an experiment was conducted by R. G. Pearson, near Leroy. It proved inconclusive because the land on which the experiment was conducted proved not uniform. (See page 240.)

In CLARKE COUNTY, in 1914, R. L. Hearron conducted an experiment, six miles West of Thomasville on the same plots as his experiment of 1918. This experiment proved inconclusive because of heavy weevil infestation on this very late planted cotton. Dry weather in the spring caused Mr. Hearron to have to plant the test a second time. (See page 240.)

In GREENE COUNTY, an experiment conducted by W. H. Meyers, near Eutaw, in 1914, proved inconclusive. (See page 240.)

In HALE COUNTY, an experiment conducted by B. L. Allen, 2½ miles North of Newbern in 1914, on black prairie soil, proved inconclusive because of lack of uniformity in the land. (See page 240.)

In PERRY COUNTY, an experiment conducted by J. H. Lee, near Hamburg, in 1916, proved inconclusive because of excessive damage due to boll weevil. This experiment on rich prairie soil was damaged so that no plot produced more than 36 pounds seed cotton. (See page 240.)

In MARENGO COUNTY, an experiment conducted in 1915, by J. S. Phillips near Thomaston proved inconclusive because of lack of uniformity of the soil. (See page 240.)

In WILCOX COUNTY, an experiment was conducted by J. A. McGhee, in 1914, one-half mile East of Catherine. It proved inconclusive because of damage done by boll weevils and by cotton wilt. (See page 240.)

