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Local Fertilizer Experiments With Cotton
in 1895, 1896, 1897 and 1898

IN 1905, 1906, 1907, AND 1908

BY

J. F. DUGGAR, Director.

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LOCAL FERTILIZER EXPERIMENTS WITH COTTON IN 1905, 1906, 1907, AND 1908.

BY J. F. DUGGAR.

For a number of years this Station has conducted numerous local fertilizer experiments, furnishing material and instructions to farmers agreeing to make the tests.

The number of local fertilizer experiments with cotton, of which reports were received, was as follows: In 1905, ten; in 1906, thirteen; in 1907, ten; and in 1908, twenty-two. This does not include a number of experiments begun and not successfully completed. In all of these years fertilizer experiments were also made on corn and other crops, the results of which will be published later.

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

Small lots of carefully weighed and mixed fertilizers were supplied to each experimenter. Detailed instructions as to how to conduct the experiments and blank forms for reporting results, were also furnished.

The following list gives the name and address of each experimenter who has reported the results of fertilizer experiments made under our direction during the past four years, with page of this bulletin where the results may be found.

COUNTY.	POST OFFICE	NAME.	DATE.	PAGE
Autauga ..	Pra'tville.....	J. W. Young.....	1905-6.....	49-52
Barbour ...	Louisville.....	J. D. Veal.....	1906.....	69
Blount	Tidmore	Jno. W. Staab.....	1905.....	39-42
Bullock....	Union Spr'gs ..	F. B. Haynes.....	1908.....	78
Bullock ...	Three Notch... ..	A. M. Cope.....	1906.....	68-69
Bullock ...	Suspension ...	O. M. Hill	1906.....	78
Chambers ..	Fredonia	E. W. Smartt	1905.....	78
Chilton ...	Verbena.....	G. H. Caffey	1907-8.....	49-50
Chilton ...	Verbena.....	J. H. Willoughby ..	1905-6-8 ..	47-49
Conecuh ..	Betts	R. H. Betts	1905-6-7.....	75-76
Cullman ...	Cullman	L. A. Fealy	1906.....	39-42
Cullman ...	Joppa.....	O. G. Roberts..	1906-7-8 ..	39 40
Fayette....	Newtonville ..	J. B. Gibson	1906-7-8....	45-47, 78
Franklin ..	Russellville ...	T. J. Willis	1905-6.....	29-30
Geneva ...	Geneva.....	M. P. Metcalf	1905.....	69-70
Greene	Eutaw.....	W. W. Morgan	1908	48
Henry	Headland.....	W. F. Covington ..	1907-8.....	73
Henry	Columbia	T. Z. Atkeson	1908.....	71-73

COUNTY	POST OFFICE	NAME	DATE	PAGE
Lauderdale	Florence	W. A. Parish	1905-6	30-31
Lauderdale	Florence	J. W. Haddock	1907-8	30-32
Lawrence	Hillsboro	F. T. Nealy	1905	35
Lee	Auburn	Ala. Expt. Station	1905-6	59
Lee	Auburn	Jno Jackson	1908	57-58
Lee	Bee Hive	T. W. Cox	1905-6	58
Macon	Notasulga	S. C. Jackson	1905	61-64
Macon	Shorter	Y. Swearington	1906	61-65
Macon	Society Hill	Robt. Floyd	1806-7	66
Macon	Hurtsboro	A. B. Floyd	1908	66
Madison	Huntsville	H. D. N. Wales	1905	33-35
Marengo	Faundsdales	W. C. McNight	1905	53-54
Marion	Hamilton	6th Dist. Agr. School	1906	39-42
Morgan	Hartselle	J. O. Burleson	1907-8	35-36
Montgom'ry	Montgomery	J. M. Jones	1906-7	54
Montgom'ry	Montgomery	T. M. Oliver	1907	52-56
Montgom'ry	Naftel	W. C. Naftel	1905	78
Pickens	Gordon	D. W. Davis	1906	78
Tallapoosa	Notasulga	M. E. Parker	1907	59
Tallapoosa	Notasulga	E. B. Jackson	1907	61-63
Tallapoosa	Notasulga	J. W. Parker	1907	61-62
Walker	Cordova	J. L. Alexander	1908	39-44
Winston	Nauvoo	W. M. Omery	1908	39-43

The directions stated that land employed for this test should be level and uniform, not manured in recent years, not in cowpeas the preceding year, and that it should be representative of large soil areas in its vicinity. The need of perfect uniformity of 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.

THE RAINFALL.

The following data are taken from the records of the Alabama section of the Weather Bureau, and show the average rainfall for the state:

	INCHES RAINFALL.			
	1905	1906	1907	1908
January	5.26	4.66	2.20	4.28
February	7.24	2.39	5.04	6.30
March	3.70	9.26	2.94	4.77
April	3.69	1.03	6.26	5.84
May	5.51	4.63	7.94	5.34
June	4.56	3.45	2.85	2.75
July	4.56	8.50	5.00	4.72
August	5.30	3.78	3.50	3.44
September	2.51	8.44	5.50	2.42
October	4.39	3.54	1.44	1.76
November	1.78	2.50	6.15	1.52
December	6.46	4.19	6.01	5.02
Average	55.38	56.56	54.66	48.16
Average yearly normal				51

THE FERTILIZERS USED.

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

	Per Ton.
Acid phosphate (14 per cent. available) -----	\$14.00
Cotton seed meal -----	25.00
Kainit -----	15.00

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

In each experiment two plots were left unfertilized, these being plots 3 and 8. When these yields differed widely the experiment was classed as inconclusive. The increase on plots 4 to 7 is calculated on the assumption that the graduation in fertility is uniform from plot 3 to plot 8. The following table shows what kinds and amounts of fertilizers were used on certain plots; the number of pounds of nitrogen, phosphoric acid, and potash supplied per acre by each fertilizer mixture; and the percentage composition and cost per ton of each mixture, the latter being given in order that these mixtures may be readily compared with various brands of prepared guanos.

PRICE ASSUMED FOR SEED COTTON.

The price assumed is \$14.00 per ton for seed, and 10 cents per pound for lint, a price found by averaging prices of 9, 11, 11, and 9 cents per pound respectively, for the crops of 1904, '5, '6, '7, and '8. This is equal to 3.8 cents per pound of seed cotton turning out $33 \frac{1}{3}$ per cent. of lint. Deducting $\frac{6}{10}$ cents per pound as the average cost of picking and ginning, and we have left 3.2 cents as the net value per pound of the increase of seed cotton due to fertilizers. This latter is the figure used in all financial calculations.

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

Plot No.	FERTILIZERS		MIXTURE CONTAINS			COST OF FERTILIZERS	
	Amount per acre.	KIND	Nitrogen	†Available phosphoric acid	Potash.	Per ton	Per acre
1	200	Cotton seed meal	Lbs. 13.58	Lbs. 5.76	Lbs. 3.54	\$25.00	\$2.50
		<i>In 100 lbs. c. s. meal.*</i>	6.79	2.88	1.77		
2	240	Acid phosphate		36.12		14.00	1.68
		<i>In 100 lbs. acid phos.</i>		15.05			
4	200	Kainit			24.60	15.00	1.50
		<i>In 100 lbs. kainit.</i>			12.30		
5	200	Cotton seed meal	13.58	41.88	3.54	18.99	4.28
		Acid phosphate					
	240	<i>In 100 lbs above mixt.</i>	3.09	9.52	.80		
6	200	Cotton seed meal	13.58	5.76	28.14	19.50	4.00
		Kainit					
	200	<i>In 100 lbs. above mixt.</i>	3.39	1.44	7.03		
7	240	Acid phosphate				14.45	3.18
		Kainit					
	200	<i>In 100 lbs. above mixt.</i>		8.21	5.59		
9	200	Cotton seed meal	13.58	41.88	28.14	17.81	5.68
		Acid phosphate					
	240	<i>In 100 lbs above mixt.</i>	2.12	6.54	4.39		
10	200	Cotton seed meal	13.58	41.88	15.84	18.24	5.93
		Acid phosphate					
	100	Kainit					
		<i>In 100 lbs above mixt.</i>	2.59	7.75	2.93		

*Average of many analysis.

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

Those farmers who are more accustomed to the word ammonia than to the term nitrogen, can change the figures for nitrogen into their ammonia equivalents by multiplying by

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

FRANKLIN COUNTY, 5 MILES NORTH-WEST OF RUSSELLVILLE.
T. J. WILLIS, 1905-6, (See Table, p. 30.)

Dark gray sandy soil, with light colored clay subsoil.

These tests were made on a hilltop which had been in cultivation about 10 years. The forest growth was hardwoods.

It is evident that this soil responded freely to every fertilizer, whether applied singly, by twos, or all three together.

In both years a complete fertilizer (plots 9 or 10) was the most profitable application, closely followed in yield and profit by a mixture of acid phosphate and cotton seed meal. On plot 9 the complete fertilizer increased the yield by 1000 and by 792 pounds of seed cotton. After deducting the cost of the fertilizer (p 29) this left profits of \$26.32 and \$19.66 per acre. Phosphate was most effective, cotton seed meal next, and kainit least, but still useful.

	1905	1906
	Lbs.	Lbs
<i>Average yield of seed cotton, unfertilized</i>	352	376
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	192	24
To acid phosphate plot	172	120
To kainit plot	204	144
To acid phosphate and kainit plot.....	167	176
<i>Average increase with cotton seed meal</i>	184	116

Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	664	456
To cotton seed meal plot	644	552
To kainit plot	739	600
To cotton seed meal and kainit plot	702	632
<i>Average increase with acid phosphate</i>	687	560

Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	94	16
To cotton seed meal plot	106	136
To acid phosphate plot.....	169	160
To cotton seed meal and acid phosphate plot.....	164	216
<i>Average increase with kainit</i>	133	132

Experiment at Russellville (Franklin Co.) and near Florence (Lauderdale Co.) 1905-6-7-8

Plot No.	FERTILIZER		T. J. WILLIS Russellville 1905		T. J. WILLIS Russellville 1906		J. W. PARISH Florence 1905		W. A. PARISH Florence 1906		J. W. HADDOCK Florence 1907		J. W. HADDOCK Florence 1908	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs.		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
2	200	Cotton seed meal...	520	192	400	24	608	336	408	232	672	72	910	460
3	240	Acid phosphate....	992	664	832	456	664	392	368	192	1032	432	650	200
4	.....	No fertilizer.....	327	.....	376	.....	272	.....	176	.....	600	.....	450	.....
5	200	Kainit.....	432	94	392	16	608	308	352	179	1424	818	800	340
6	200	Cotton seed meal..	1184	836	952	576	1184	857	608	438	1840	1288	1550	1080
	200	Acid phosphate...												
7	200	Cotton seed meal..	656	298	536	160	960	606	320	153	1256	728	1010	530
	200	Kainit.....												
8	240	Acid phosphate....	1200	833	992	616	920	539	456	293	.....	.....	710	220
	200	Kainit.....												
9	.....	No fertilizer.....	376	.....	376	.....	408	.....	160	.....	480	.....	500	.....
	200	Cotton seed meal..												
	240	Acid phosphate...												
10	200	Kainit.....	1376	1000	1168	792	816	408	544	384	1208	728	1100	600
	200	Cotton seed meal..												
10	240	Acid phosphate....	1408	1032	896	520	824	416	528	368	872	392	980	480
	100	Kainit.....												

LAUDERDALE COUNTY, 10 MILES WEST OF FLORENCE.

W. A. PARISH, 1905-6. (See Table, p. 30.)

In 1905 stiff light gray soil with red subsoil; in 1906 darker soil, with red clay subsoil.

Both fields had been cleared for 30 or 40 years. The original forest trees are said to have been post oak, red oak, black oak, and hickory. Every fertilizer considerably increased the yield in both years. In both years the largest increase, 857 pounds and 438 pounds of seed cotton respectively, was afforded by plot 5, fertilized with a mixture of cotton seed meal and phosphate. This represents a net profit of \$23.14 and \$9.73 per acre. In 1904 a test made by Mr. Parish on gray soil with reddish subsoil showed an average increase attributable to cotton seed meal of 249 pounds of seed cotton per acre; an increase due to acid phosphate of 584 pounds; and an increase due to kainit of 212 pounds of seed cotton. This indicated a need for the complete fertilizer, while the later tests gave good results without kainit.

It seems that this soil needs chiefly phosphoric acid, but that this should usually be supplemented by nitrogen. The soil on which both Mr. Parish and Mr. Had-dock made their experiments was that known locally as "The Barrens," and described in soil survey reports as "Clarksville Silt Loam."

	1904	1905	1906
<i>Average yield of seed cotton per acre, unfertilized.</i>	452	340	168
Increase of seed cotton when cotton seed meal was added:			
To unfertilized plot	284	336	232
To acid phosphate plot	269	465	246
To kainit plot	237	298	—26
To acid phosphate and kainit plot	208	131	91
<i>Average increase with cotton seed meal</i>	249	242	138

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

To unfertilized plot	696	392	192
To cotton seed meal plot	681	521	206
To kainit plot	494	231	114
To cotton seed meal and kainit plot	465	198	231
<i>Average increase with acid phosphate</i>	584	236	188

Increase of seed cotton per acre when kainit was added:

To unfertilized plot.....	334	308	179
To cotton seed meal plot.....	287	270	--79
To acid phosphate plot	132	147	101
To cotton seed meal and acid phosphate plot	71	449	--54
<i>Average increase with kainit</i>	212	69	37

LAUDERDALE COUNTY, 10 MILES WEST OF FLORENCE.

J. W. HADDOCK, 1907-8. (See Table, p. 30.)

Gray soil, with red subsoil.

This field had been cleared about 40 years, and was of the same character as soil used in Mr. Parish's experiment. The stand was uniform. The results both years agree with Mr. Parish's experiments in showing that the most effective fertilizer was a mixture of acid phosphate and cotton seed meal, the phosphate being more important. It is curious and inexplicable that kainit when applied alone gave a large increase, but when combined with either or both of the other fertilizers it gave little or no increase. These tests, though presenting some figures that cannot be understood, confirmed the conclusions drawn from Mr. Parish's tests, namely, that acid phosphate is most important, that it should be supplemented by cotton seed meal, and that potash is generally unnecessary.

	1907	1908
	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	540	475
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	72	460
To acid phosphate plot	856	880
To kainit plot	—120	190
To acid phosphate and kainit plot		380
<i>Average increase with cotton seed meal</i>	269	478

Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	432	200
To cotton seed meal plot	121	620
To kainit plot		—120
To cotton seed meal and kainit plot	0 0	70
<i>Average increase with acid phosphate</i>	576	193

Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	848	340
To cotton seed meal plot	656	70
To acid phosphate plot		20
To cotton seed meal and acid phosphate	—560	—600
<i>Average increase with kainit</i>	315	—43

MADISON COUNTY, 5 MILES WEST OF HUNTSVILLE.

H. D. N. WALES, 1905. (See Table, p. 35.)

Red soil, with red subsoil.

This worn red lime soil responded freely only to applications of cotton seed meal. Other tests made in Madison County indicate a general need on such soils for both nitrogen and phosphate. Results from potash have been variable, the majority of the tests showing that little or no potash is needed.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	376
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	144
To acid phosphate plot	96
To kainit plot	144
	<hr/>
<i>Average increase with cotton seed meal</i>	128
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	88
To cotton seed meal plot	40
To kainit plot	—32
	<hr/>
<i>Average increase with acid phosphate</i>	24
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	72
To cotton seed meal plot	72
To acid phosphate plot	—48
	<hr/>
<i>Average increase with kainit</i>	24

Experiments in Madison, Lawrence and Morgan Counties.

Plot No.	FERTILIZER		HUNTSVILLE		HILLSBORO		HARTSELLE Red land		HARTSELLE Gray land	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	200	Cotton seed meal	520	144	272	48	798	112	780	210
2	240	Acid phosphate	464	88	264	40	776	120	1140	370
3	...	No fertilizer	376	...	224	...	656	...	570	...
4	200	Kainit	448	72	247	21	744	94	680	126
5	200	Cotton seed meal	560	184	496	265	744	100	1210	672
	240	Acid phosphate								
6	200	Cotton seed meal	592	216	424	190	712	74	980	350
	200	Kainit								
7	240	Acid phosphate	416	40	456	219	632	1	900	394
	200	Kainit								
8	...	No fertilizer	376	...	240	...	624	...	490	...
9	200	Cotton seed meal . . . . .	...	...	744	504	864	240	1070	580
	240	Acid phosphate								
	200	Kainit								
10	200	Cotton seed meal . . . . .	...	...	616	376	752	128	1010	520
	240	Acid phosphate								
	100	Kainit								

LAWRENCE COUNTY, 1 MILE EAST OF HILLSBORO.

F. T. NEALY, 1905. (See Table above.)

Gray sandy loam soil, with yellow subsoil.

This field had been cleared about 70 years of its growth of hardwoods. It had grown up in weeds during the four years preceding this experiment. Rains were almost continuous throughout the season, making cultivation almost impossible. Under these unfavorable conditions a complete fertilizer was the most effective and profitable.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	232
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	48
To acid phosphate plot	225
To kainit plot	161
To acid phosphate and kainit plot.....	285
<i>Average increase with cotton seed meal</i>	180

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	40
To cotton seed meal plot	217
To kainit plot	198
To cotton seed meal and kainit plot	314
<i>Average increase with acid phosphate</i>	192

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	21
To cotton seed meal plot	142
To acid phosphate plot	179
To cotton seed meal and acid phosphate plot	239
<i>Average increase with kainit</i>	145

MORGAN COUNTY, 4 MILES WEST OF HARTSELLE.

J. O. BURLERSON, 1907-8. (See Table, p. 35.)

In 1907, soil, red, lime table land; Subsoil, red. The original growth was hickory, removed about 80 years before.

The soil was the ordinary lime soil of the Tennessee Valley Region. A complete fertilizer afforded the largest yield. Apparently the greatest need was for nitrogen.

In 1908, typical sandy mountain land, dark gray soil with red subsoil.

The original growth was shortleaf pine and hardwoods, and the land had been in cultivation about 10 years. The largest increase was afforded by a mixture of cotton seed meal and acid phosphate. The chemical chiefly needed by this soil was acid phosphate.

	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized.</i>	640	530
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	112	210
To acid phosphate plot	—20	402
To kainit plot	—20	—20
To acid phosphate and kainit plot	239	230
<i>Average increase with cotton seed meal</i>	78	206

Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	120	370
To cotton seed meal plot	—12	462
To kainit plot	—93	268
To cotton seed meal and kainit plot	166	230
<i>Average increase with acid phosphate</i>	45	333

Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	94	126
To cotton seed meal plot	—38	140
To acid phosphate plot	—119	24
To cotton seed meal and acid phosphate plot	140	—92
<i>Average increase with kainit</i>	19	50

CULLMAN COUNTY, 2 MILES SOUTH WEST OF JOPPA.

O. G. ROBERTS, 1906-7-8. (See Table, p. 39.)

Gray sandy upland with yellow clay subsoil.

The original growth was short leaf pines and hardwoods, characteristic of the Mountain Plateau Region. This field had been cleared for about 24 years.

In all three years the largest profit was made on plot 5 by using a mixture of cotton seed meal and acid phosphate. In every case there was no advantage in adding kainit to the other two chemicals. This inefficiency of potash in these tests is further borne out by the fact that, of the two complete fertilizers, the one with the smaller amount of potash each year afforded the larger yield. These results also agree with the results of Mr. Burleson's tests on similar gray plateau soil.

	1906.	1907.	1908.
	Lbs.	Lbs.	Lbs.
<i>Average yield of seed cotton per acre unfertilized</i> ..	248	360	312
Increase in seed cotton when cotton seed meal was added:			
To unfertilized plot	200	22	144
To acid phosphate plot	174	218	132
To kainit plot	190	58	166
To acid phosphate and kainit plot	—17	43	164
<i>Average increase with cotton seed meal</i>	137	85	152
Increase of seed cotton per acre when acid phosphate was added:			
To unfertilized plot	288	174	292
To cotton seed meal plot	262	370	280
To kainit plot	342	121	112
To cotton seed meal and kainit plot	135	114	110
<i>Average increase with acid phosphate</i>	257	195	199
Increase of seed cotton per acre when kainit was added:			
To unfertilized plot	75	182	156
To cotton seed meal plot	65	210	178
To acid phosphate plot	129	129	—24
To cotton seed meal and acid phosphate plot	—62	—46	8
<i>Average increase with kainit</i>	52	119	80

Fertilizer Experiments in Blount, Cullman, Marion, Winston and Walker Counties.

Plot No.	FERTILIZER		JOPPA 1906		JOPPA 1907		JOPPA 1908		TID-MORE 1905		CULL-MAN 1906		HAMILTON 1906		NAUVOO 1908		CORDOVA 1908	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal...	416	200	438	22	472	144	[568]	[372]	544	152	288	Lbs. 32	490	90	1460	320
2	240	Acid phosphate....	504	288	590	174	620	292	276	80	588	196	310	64	595	195	1560	420
3	....	No fertilizer.....	216	....	416	....	328	....	196	....	392	....	256	....	400	....	1140	....
4	200	Kainit.....	304	75	576	182	476	156	264	70	553	136	312	49	480	81	1270	120
5	200	Cotton seed meal..	664	462	764	392	736	424	380	188	904	[464]	632	362	790	392	1500	340
	240	Acid phosphate..																
6	200	Cotton seed meal..	520	265	582	232	626	322	376	186	832	368	456	180	605	208	....	....
	200	Kainit.....																
7	240	Acid phosphate..	648	417	630	303	564	268	220	33	800	312	544	262	550	154	1630	450
	200	Kainit.....																
8	....	No fertilizer.....	280	....	304	....	288	....	184	....	512	....	288	....	395	....	1190	....
9	200	Cotton seed meal..	680	400	650	3450	720	432	372	188	872	360	592	304	820	425	1560	370
	240	Acid phosphate..																
	200	Kainit.....																
10	200	Cotton seed meal..	720	440	684	380	726	438	352	168	912	400	528	240	860	465	1800	610
	240	Acid phosphate..																
	100	Kainit.....																

BLOUNT COUNTY, 2 MILES NORTH OF TIDMORE.

JOHN W. STAAB, 1905. (See Table, p. 39.)

Mulatto, fine sandy loam, with reddish yellow subsoil.

The rainfall was heavy. Apparently plot 1 was on richer land than the other plots. The chief need was for nitrogen. Phosphate and kainit were of little value.

On the other hand, in a similar experiment made by Mr. Staab the preceding year on apparently the same character of land, the increase in yield of seed cotton per acre averaged for cotton seed meal 215 pounds, for acid phosphates 282 pounds, and for kainit 77 pounds.

	Lbs.
<i>Average yield of seed cotton, unfertilized</i>	190
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	
To acid phosphate plot	108
To kainit plot	116
To acid phosphate and kainit plot	155
<i>Average increase with cotton seed meal</i>	126

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	80
To cotton seed meal plot	
To kainit plot	—37
To cotton seed meal and kainit plot	2
<i>Average increase with acid phosphate</i>	15

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	70
To cotton seed meal plot	
To acid phosphate plot	—47
To cotton seed meal and acid phosphate plot	00
<i>Average increase with kainit</i>	8

CULLMAN COUNTY, 1 MILE SOUTH OF CULLMAN.

L. A. FEALY, 1906. (See Table, p. 39.)

Gray sandy loam, with yellow loam subsoil.

On this upland field, long in cultivation, a mixture of acid phosphate and cotton seed meal gave the largest yield; but this result may have been due to the fact that this plot occupied the lowest position in the field. On this account it is impossible to determine whether potash was needed on this soil.

In 1904 on similar land Mr. Fealy made a test in which the average increase from cotton seed meal was 180 pounds, from acid phosphate 176 pounds, and from kainit 98 pounds.

	Lbs.
<i>Average yield of seed cotton, unfertilized</i>	452
Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot	152
To acid phosphate plot	268
To kainit plot	232
To acid phosphate and kainit plot	48
<i>Average increase with cotton seed meal</i>	175
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	196
To cotton seed meal plot ..	312
To kainit plot	176
To cotton seed meal and kainit plot	—8
<i>Average increase with acid phosphate</i>	169
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	136
To cotton seed meal plot	216
To acid phosphate plot	116
To cotton seed meal and acid phosphate plot	—104
<i>Average increase with kainit</i>	91

MARION COUNTY, HAMILTON.

SIXTH DISTRICT AGRICULTURAL SCHOOL, 1906. (Table, p. 39.)

Sandy land with yellow clay subsoil.

For 3 or 4 years preceeding the experiment this land had been uncultivated and occupied by weeds.

The largest and most profitable yield was afforded by plot 5, fertilized with cotton seed meal and acid phosphate. A test made on the same farm in 1903 (Ala. Station Bulletin No. 131) showed a need for a complete fertilizer, in which, however, potash was less effective than either nitrogen or phosphate.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	272
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	32
To acid phosphate plot	298
To kainit plot	131
To acid phosphate and kainit plot	42
<i>Average increase with cotton seed meal</i>	126

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	64
To cotton seed meal plot	330
To kainit plot	213
To cotton seed meal and kainit plot	124
<i>Average increase with acid phosphate</i>	183

Increase of seed cotton per acre when kainit was added:	
<i>Average yield of seed cotton per acre, unfertilized</i>	397
To unfertilized plot	49
To cotton seed meal plot	148
To acid phosphate plot	198
To cotton seed meal and acid phosphate plot	58
<i>Average increase with kainit</i>	84

WINSTON COUNTY, 3 MILES NORTH EAST OF NAUVOO.

W. M. OMARY, 1908. (See Table, p. 39.)

Gray sandy soil with a reddish clay subsoil; "coal land."

This field had been in cultivation only about 6 years; the original growth is stated to have been short leaf pine.

While a complete fertilizer afforded the largest yield, yet the increase on plot 5, receiving only cotton seed meal and phosphate, was almost as large and the profit on plot 5 was even greater than on plot 9.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	397
Increase of seed cotton where cotton seed meal was added:	
To unfertilized plot	90
To acid phosphate plot	197
To kainit plot	127
To acid phosphate and kainit plot	271
<i>Average increase with cotton seed meal</i>	171
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	195
To cotton seed meal plot	302
To kainit plot	73
To cotton seed meal and kainit plot	217
<i>Average increase with acid phosphate</i>	197
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	81
To cotton seed meal plot	118
To acid phosphate plot	41
To cotton seed meal and acid phosphate plot	33
<i>Average increase with kainit</i>	48

WALKER COUNTY, 3 MILES SOUTH OF CORDOVA.

G. L. ALEXANDER, 1908. (See Table, p. 39.)

Gray sandy upland with red clay subsoil.

This field had been cleared for about 40 years. Evidently the land had been kept in a high state of fertility.

The stand was uniform.

It is clear that the chief need of this soil was for acid phosphate. There was no need for potash. The figures for nitrogen are confusing, probably due to the relatively productive condition of this land. Apparently plot 10 was on richer soil than the other plots.

<i>Average yield of seed cotton per acre, unfertilized</i>	1165
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	320
To acid phosphate plot	—80
To acid phosphate and kainit plot	—80
<i>Average increase with cotton seed meal</i>	54

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	420
To cotton seed meal plot	20
To kainit plot	330
<i>Average increase with acid phosphate</i>	257

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	120
To acid phosphate plot	30
To cotton seed meal and acid phosphate plot	30
<i>Average increase with kainit</i>	60

FAYETTE COUNTY, 1 1-2 MILES WEST OF NEWTONVILLE.

J. B. GIBSON, 1906-7. (See Table, p. 46.)

Dark sandy soil with red clay subsoil.

This level upland field, on which the original growth was oak and short leaf pine, has been cleared about 18 years.

There was an increase with either cotton seed meal, acid phosphate, or kainit, whether these were used separately or in every possible combination. Apparently the greatest need was for acid phosphate.

	1906.	1907.
	Lbs.	Lbs.
<i>Average yield of seed cotton, unfertilized</i>	560	348
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	784	576
To acid phosphate plot	24	86
To kainit plot	72	54
To acid phosphate and kainit plot	216	92
<i>Average increase with cotton seed meal</i>	274	202

Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	880	640
To cotton seed meal plot	120	150
To kainit plot	128	129
To cotton seed meal and kainit plot	268	167
<i>Average increase with acid phosphate</i>	349	272

Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	720	611
To cotton seed meal plot	8	89
To acid phosphate plot	—32	100
To cotton seed meal and acid phosphate plot	160	106
<i>Average increase with kainit</i>	214	227

Fertilizer Experiments in Fayette and Greene Counties.

Plot No	FERTILIZER		NEWTON-VILLE 1906		NEWTON-VILLE 1907		CLINTON 1908	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal	Lbs. 1304	Lbs. 784	Lbs. 912	Lbs. 576	Lbs. 768	Lbs. 144
2	240	Acid phosphate	1400	880	976	640	760	136
3	....	No fertilizer.....	520	.....	336	.....	624	....
4	200	Kainit	1256	720	952	611	672	49
5	200	Cotton seed meal	1456	904	1072	726	696	74
	240	Acid phosphate						
6	200	Cotton seed meal	1360	792	1016	665	687	08
	200	Kainit						
7	240	Acid phosphate	1432	848	1096	740	622	14
	200	Kainit						
8	....	No fertilizer.....	600	.....	360	.....	616	....
9	200	Cotton seed meal	1664	1064	1192	832	680	64
	240	Acid phosphate						
	200	Kainit						
10	200	Cotton seed meal	1600	1000	1272	912	704	88
	240	Acid phosphate						
	100	Kainit						

GREENE COUNTY, 6 MILES NORTH OF CLINTON.

W. M. MORGAN, 1908. (See Table above.)

Dark soil with clay foundation.

The original growth, consisting chiefly of short leaf pine, was removed about nine years before the test was made. The two crops preceding the experiment consisted of cotton. No fertilizer very greatly increased the yield. From Mr. Morgan's notes it may be inferred that the land is in poor mechanical condition, much inclined to bake, and that on all plots there was much shedding of forms, but no rust.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	620
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	144
To acid phosphate plot	—62
To kainit plot	19
To acid phosphate and kainit plot	50
<hr/>	
<i>Average increase with cotton seed meal</i>	38

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	136
To cotton seed meal plot	—70
To kainit plot	—35
To cotton seed meal and kainit plot	—4
<hr/>	
<i>Average increase with acid phosphate</i>	7

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	49
To cotton seed meal plot	—76
To acid phosphate plot	—122
To cotton seed meal and acid phosphate plot	—10
<hr/>	
<i>Average increase with kainit</i>	—40

CHILTON COUNTY, 2 MILES WEST OF VERBENA.

J. H. WILLOUGHBY, 1905-6-7-8. (See Table, p. 49.)

Gray sandy soil with a red subsoil.

Every year this test was made on soil that had been long in cultivation. In each of the four years the complete fertilizer (plot 9) afforded a larger yield than the mixture of any two fertilizers. In every test the complete fertilizer afforded the largest net profit. When the chemicals were used separately or by twos their effect was variable, but when all 3 were combined each chemical in this mixture increased the yield more than enough to pay its cost.

	1905	1906	1907	1908
	Lbs.	Lbs.	Lbs.	Lbs.
<i>Average yield of seed cotton per acre unfertilized</i>	408	256	328	550
Increase of seed cotton when cotton seed meal was added:				
To unfertilized plot	384	104	64	230
To acid phosphate plot	104	85	60	142
To kainit plot	96	21	-36	-18
To acid phosphate and kainit plot	272	62	279	256
<i>Average increase with cotton seed meal</i>	214	68	60	153

Increase of seed cotton per acre when acid phosphate was added:				
To unfertilized plot	168	128	32	50
To cotton seed meal plot	-112	109	156	-38
To kainit plot	16	36	-101	-142
To cotton seed meal and kainit plot	192	77	214	132
<i>Average increase with acid phosphate</i>	66	87	75	1

Increase of seed cotton per acre when kainit was added:				
To unfertilized plot	136	206	158	186
To cotton seed meal plot	-152	123	186	-62
To acid phosphate plot	-16	114	25	-6
To cotton seed meal and acid phosphate plot ..	152	91	244	108
<i>Average increase with kainit</i>	30	133	153	57

Verbena (Chilton County) Experiments by J. H. Willoughby and G. H. Caffey.

Plot No.	FERTILIZER		VERBENA W. 1905		VERBENA W. 1906		VERBENA W. 1907		VERBENA W. 1908		VERBENA C. 1907		VERBENA C. 1908	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	200	Cotton seed meal	Lbs. 752	Lbs. 384	Lbs. 376	Lbs. 104	Lbs. 640	Lbs. 64	Lbs. 820	Lbs. 230	Lbs. 888	Lbs. 144	Lbs. 710	Lbs. 160
2	240	Acid phosphate	536	168	40	128	736	32	640	50	653	91	710	80
3	...	No fertilizer	368	.....	272	.....	704	.....	590	.....	744	.....	630	.....
4	200	Kainit	520	136	472	206	832	158	760	186	904	196	650	40
5	200	Cotton seed meal	672	272	472	213	736	92	750	192	848	177	910	320
	240	Acid phosphate												
6	200	Cotton seed meal	648	232	380	227	736	122	710	168	848	214	740	170
	200	Kainit												
7	240	Acid phosphate	584	152	488	242	640	57	570	44	700	103	680	130
	200	Kainit												
8	...	No fertilizer	448	.....	240	.....	552	.....	510	.....	560	.....	530	.....
9	200	Cotton seed meal	872	424	544	304	888	336	810	300	1024	464	860	303
	240	Acid phosphate												
10	200	Kainit	760	312	456	216	856	304	800	290	952	392	810	280
	240	Acid phosphate												
	100	Kainit												

CHILTON COUNTY, 1-2 MILE SOUTH OF VERBENA.
G. H. CAFFEY, 1907-8. (See Table, p. 49.)

Rather stiff, dark, sandy soil, with a red clay subsoil.

This piece of high upland was cleared 60 or 70 years ago of its original growth of longleaf pine, oak, hickory, and dogwood. The results for the two years suggest that the fertilizer which pays best one season is not necessarily the one most effective in a different season. In 1907 there was need for a complete fertilizer, in which the most effective constituent was nitrogen, closely followed by potash; phosphate was also helpful when used in combination, with *both* of the other constituents.

In 1908, on the contrary, kainit was of practically no value nitrogen being most important, followed by phosphate. A mixture of cotton seed meal and phosphate gave the greatest profit.

In 1907 the complete fertilizer on plot 9, costing \$5.68 per acre, increased the yield of seed cotton by 464 pounds per acre, worth at 3.2 cents, \$14.85. This leaves a net profit of \$8.17 due to the complete fertilizer. Likewise in 1908 the increase on plot 5, with meal and phosphate costing \$4.28, afforded a net profit of \$5.96.

	1907	1908
	Lbs.	Lbs.
<i>Average yield of seed cotton unfertilized</i>	652	580
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	144	160
To acid phosphate plot	268	240
To kainit plot	18	130
To acid phosphate and kainit plot	361	200
<i>Average increase with cotton seed meal</i>	198	183

Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	—91	80
To cotton seed meal plot	33	160
To kainit plot	—93	90
To cotton seed meal and kainit plot	250	160
	<hr/>	<hr/>
<i>Average increase with acid phosphate</i>	25	123

Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	196	40
To cotton seed meal plot	70	10
To acid phosphate plot	194	50
To cotton seed meal and acid phosphate plot.....	287	10
	<hr/>	<hr/>
<i>Average increase with kainit</i>	187	28

AUTAUGA COUNTY, 2 MILES EAST OF PRATTVILLE.

J. W. YOUNG, 1905-6-7. (See Table, p. 52.)

Reddish sandy soil with a red clay subsoil.

The stand each year was good and uniform. Results were somewhat obscured by unfavorable weather conditions in 1905 and by the September storm and the occurrence of early frost in 1906. Evidently the chief need of the soil, long in cultivation, was for nitrogen. Phosphoric acid was also needed. A mixture of cotton seed meal and acid phosphate, (plot 5), in all cases gave a profitable increase. In a complete fertilizer in 1905 and 1906 kainit increased the yield to the extent of 112 and 77 pounds of seed cotton respectively; but when used alone or in combination with either one of the other fertilizers, kainit was usually unprofitable, and it was also without effect in the complete fertilizer in 1907.

Autauga and Montgomery (Sandy Land) Experiments.

Plot No.	FERTILIZER		Prattville 1904		Prattville 1905		Prattville 1906		MONTGOMERY Red sandy	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	200	Cotton seed meal . . .	Lbs. 816	Lbs. 184	Lbs. 936	Lbs. 296	Lbs. 912	Lbs. 156	Lbs. 744	Lbs. 112
2	240	Acid phosphate . . .	752	120	800	160	816	60	664	32
3	...	No fertilizer	632	...	640	...	756	...	632	...
4	200	Kainit	640	24	680	34	780	12	552	66
5	200	Cotton seed meal . . .	760	160	840	187	888	109	720	116
	240	Acid phosphate . . .								
6	200	Cotton seed meal . . .	752	168	760	101	892	102	752	1620
	200	Kainit								
7	240	Acid phosphate . . .	744	176	696	30	708	93	643	73
	200	Kainit								
8	...	No fertilizer	552	...	672	...	812	...	560	...
9	200	Cotton seed meal . . .	824	272	936	264	880	68	824	264
	240	Acid phosphate . . .								
	200	Kainit								
10	200	Cotton seed meal . . .	768	216	856	184	800	12	840	280
	240	Acid phosphate . . .								
	100	Kainit								

	1905	1906	1907
	Lbs.	Lbs.	Lbs.
<i>Average yield of seed cotton, unfertilized</i>	592	656	784
Increase of seed cotton when cotton seed meal was added:			
To unfertilized plot	184	296	156
To acid phosphate plot	40	27	49
To kainit plot	144	67	90
To acid phosphate and kainit plot	96	234	151
<i>Average increase with cotton seed meal</i>	116	156	112

Increase of seed cotton per acre when acid phosphate was added:			
To unfertilized plot	120	160	60
To cotton seed meal plot	—24	—109	—47
To kainit plot	152	—4	—105
To cotton seed meal and kainit plot	104	163	—34
<i>Average increase with acid phosphate</i>	88	53	—32

Increase of seed cotton per acre when kainit was added:			
To unfertilized plot	24	34	12
To cotton seed meal plot	—16	—195	—54
To acid phosphate plot	56	—130	—153
To cotton seed meal and acid phosphate plot	112	77	—41
<i>Average increase with kainit</i>	44	—53	—59

MARENGO COUNTY, 2 MILES SOUTH OF FAUNSDALE.

W. C. McKNIGHT, 1905. (See Table, p. 54.)

Yellowish, gravelly, prairie upland.

The largest increase and the only plot showing any decided profit from fertilizers was plot 10, which received 550 pounds of a complete fertilizer.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	414
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	62
To acid phosphate plot	170
To kainit plot	48
To acid phosphate and kainit plot	210
<i>Average increase with cotton seed meal</i>	122

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	—82
To cotton seed meal plot	56
To kainit plot	—42
To cotton seed meal and kainit plot	120
<i>Average increase with acid phosphate</i>	13

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	—20
To cotton seed meal plot	56
To acid phosphate plot	20
To cotton seed meal and acid phosphate plot	30
<i>Average increase with kainit</i>	21

*Fertilizer Experiments in Marengo and Montgomery Counties
on prairie or lime soils.*

Plot No.	FERTILIZER		FAUNSDALE		MONTGOM'RY Prairie		MONTGOM'RY Prairie		MONTGOM'RY Prairie	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal.....	Lbs. 516	Lbs. 62	Lbs. 492	Lbs. 120	Lbs. 256	Lbs. 78	Lbs. 643	Lbs. 143
2	240	Acid phosphate.....	372	82	648	276	320	14	483	15
3	....	No fertilizer	454	....	372	....	334	....	498	....
4	200	Kainit	418	20	558	183	580	233	590	119
5	200	Cotton seed meal... }	540	118	528	149	402	42	578	134
	240	Acid phosphate.... }								
6	200	Cotton seed meal .. }	434	28	528	146	694	322	663	246
	200	Kainit								
7	240	Acid phosphate.... }	328	62	648	268	690	306	593	203
	200	Kainit								
8	....	No fertilizer	374	....	388	....	396	....	363	....
9	200	Cotton seed meal... }	522	148	694	310	672	276	853	490
	240	Acid phosphate.... }								
	200	Kainit								
10	200	Cotton seed meal .. }	638	264	726	338	618	220	723	360
	240	Acid phosphate.... }								
	100	Kainit.....								

MONTGOMERY COUNTY, 6 MILES SOUTH EAST OF MONTGOMERY.

WESLEY N. JONES AND SONS, 1906-7-8.

*Black prairie soil in 1906; reddish prairie soil in 1907;
chocolate or "mulatto" prairie soil in 1908.*

In 1906 on black or dark gray prairie upland soil, the greatest increase, 338 pounds of seed cotton per acre, and the largest profit, was afforded by the complete fertilizer applied to plot 10. Apparently the chief need that year was for acid phosphate, though kainit was also helpful.

In 1907 the greatest increase was afforded by a mixture of cotton seed meal and kainit, closely followed by the plot receiving acid phosphate and kainit. In this test kainit was the only profitable fertilizer and was effective whether used alone or in combination with either acid phosphate or

kainit. The poor results on plots 1 and 2 and 5 appear to be partly due to the slightly poorer stand on those plots.

In 1908 a complete fertilizer was the most profitable; in this potash was most important, nitrogen next. Acid phosphate was ineffective when used alone or with meal, but profitable when combined with both kainit and meal, making a complete fertilizer.

In the 3 tests on this typical prairie soil, the most profitable fertilizer was in two cases a complete fertilizer and in one case kainit.

	1906	1907	1908
	Lbs	Lbs	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	380	365	431
Increase of seed cotton when cotton seed meal was added:			
To unfertilized plot	120	—78	145
To acid phosphate plot	—127	66	149
To kainit plot	—37	89	127
To acid phosphate and kainit plot	42	—30	187
<i>Average increase with cotton seed meal</i>	—1	12	152

Increase of seed cotton per acre when acid phosphate was added:			
To unfertilized plot	276	—14	—15
To cotton seed meal plot	29	120	—11
To kainit plot	85	73	84
To cotton seed meal and kainit plot	164	—46	144
<i>Average increase with acid phosphate</i>	130	33	50

Increase of seed cotton per acre when kainit was added:			
To unfertilized plot	183	233	119
To cotton seed meal plot	26	400	101
To acid phosphate plot	—8	320	218
To cotton seed meal and acid phosphate plot	161	234	356
<i>Average increase with kainit</i>	91	297	199

MONTGOMERY COUNTY, 7 MILES EAST OF MONTGOMERY.
THOS. W. OLIVER, 1907. (See Table, p. 52.)

Red sandy soil 4 to 6 in deep; red clay subsoil.

The field had been cleared perhaps 70 years before. The original growth was reported as short leaf pine and oak.

The season was unfavorable, the spring being very wet and the late summer very dry and hot.

A complete fertilizer, especially the one on plot 10, was the most profitable.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	596
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	112
To acid phosphate plot	84
To kainit plot	228
To acid phosphate and kainit plot	191
<i>Average increase with cotton seed meal</i>	154

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

To unfertilized plot	32
To cotton seed meal plot	4
To kainit plot	139
To cotton seed meal and kainit plot	102
<i>Average increase with acid phosphate</i>	69

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	—66
To cotton seed meal plot	50
To acid phosphate plot	41
To cotton seed meal and acid phosphate plot	148
<i>Average increase with kainit</i>	43

LEE COUNTY, EXPERIMENT STATION FARM.

Results of fertilizer experiments in 1905 and 1906 are reserved for another publication. Expressed briefly the results showed that on gray sandy soil (Norfolk sandy loam), the greatest increase was from potash, next from nitrogen, and the least from phosphate. The latter fact may be due to an accumulation of phosphoric acid brought about by fertilization with acid phosphate each year.

LEE COUNTY, 2 MILES WEST OF AUBURN.

JOHN JACKSON, 1908. (See Table, p. 58.)

Gray sandy loam, long in cultivation.

The largest increase, 500 pounds per acre, was afforded by plot 9, on which was used 640 pounds per acre of a complete fertilizer. This represents, at 3.2 cents per pound of seed cotton, a net profit of \$10.32 per acre above the cost of fertilizer. It should be added that the increased crop as measured by the scales was very much greater than the appearance of the plants would suggest to the eye.

Every one of the three constituents of the complete fertilizer was profitable in this mixture.

<i>Average yield of seed cotton, unfertilized</i>	560
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	190
To acid phosphate plot	10
To kainit plot	—140
To acid phosphate and kainit plot	320
<hr/>	
<i>Average increase with cotton seed meal</i>	95
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	109
To cotton seed meal plot	—80
To kainit plot	—118
To cotton seed meal and kainit plot	350
<hr/>	
<i>Average increase with acid phosphate</i>	63

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	290
To cotton seed meal plot	—40
To acid phosphate plot	80
To cotton seed meal and acid phosphate plot	390
<hr/>	
Average increase with kainit	180

Fertilizer Experiments in Lee County.

Plot No.	FERTILIZER		AUBURN J. Jackson		BEEHIVE		BEEHIVE	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal	800	190	428	156	280	96
2	240	Acid phosphate	710	100	424	152	304	120
3	....	No fertilizer	610	....	272	....	184	....
4	200	Kainit	980	290	484	202	304	123
5	200	Cotton seed meal ...	680	110	552	260	560	382
	240	Acid phosphate ...						
6	200	Cotton seed meal ...	700	150	692	392	400	525
	200	Kainit						
7	240	Acid phosphate ...	710	180	608	297	444	273
	200	Kainit						
8	....	No fertilizer	510	....	320	....	168	....
9	200	Cotton seed meal ...	1010	500	624	304	640	472
	240	Acid phosphate ...						
	200	Kainit						
10	200	Cotton seed meal ...	750	240	560	240	560	392
	240	Acid phosphate ...						
	100	Kainit						

LEE COUNTY, 4 MILES SOUTH OF LOACHAPOKA, AT BEEHIVE.

T. W. Cox, 1905-6.

Coarse sandy soil with yellow sandy subsoil.

This piece of upland had been in cultivation for many years. In 1905 rust was severe on all plots. The stand of plants was uniform. On this very poor coarse sandy soil

plot 6, fertilized with meal and kainit, gave the largest yield and the most profit in 1905, in which year every fertilizer was useful when applied alone or by twos.

In 1906 plot 9, receiving 640 pounds of complete fertilizer, afforded the largest yield and the greatest net profit. The latter test agrees with Mr. Jackson's in showing the need of a complete fertilizer on the coarse gray sandy soils of this region.

	1905	1906
	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	296	176
To unfertilized plot	156	96
To acid phosphate plot	108	260
To kainit plot	190	2
To acid phosphate and kainit plot	7	201
<i>Average increase with cotton seed meal</i>	115	140

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

To unfertilized plot	152	120
To cotton seed meal plot	104	287
To kainit plot	95	150
To cotton seed meal and kainit plot	—88	247
<i>Average increase with acid phosphate</i>	66	201

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	202	123
To cotton seed meal plot	236	129
To acid phosphate plot	145	153
To cotton seed meal and acid phosphate plot	44	90
<i>Average increase with kainit</i>	157	124

TALLAPOOSA COUNTY, 8 MILES WEST OF NOTASULGA.

M. E. PARKER, 1905-6. (See Table, p. 61.)

Gray sandy upland; yellowish subsoil.

This field was on representative long-leaf pine land, and had been in cultivation about 20 years. The five crops pre-

ceding that of 1905 were cotton fertilized with 200 pounds of guano per acre.

In 1905 cotton rust was severe and a complete fertilizer was most profitable, (plot 9 and 10); this year every fertilizer, whether applied alone, by twos, or all three together greatly increased the yield.

In 1906 the test was conducted on land that had been in oats the year before. This was a rainy season on this farm. Plot 10, with a complete fertilizer gave the largest increase and greatest profit, while plot 9, receiving a complete fertilizer with double this amount of potash, dropped lower in yield. There is no question of the effectiveness of phosphate and meal. But the results with kainit are here contradictory, this fertilizer making a satisfactory increase when used alone and also when used in the complete fertilizer on plot 10; but in other combinations kainit failed to increase the yield to any notable extent.

	1905	1906
	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	500	621
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	320	127
To acid phosphate plot	128	104
To kainit plot	40	—26
To acid phosphate and kainit plot	160	88
<i>Average increase with cotton seed meal</i>	162	73
Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	264	187
To cotton seed meal plot	72	166
To kainit plot	16	—35
To cotton seed meal and kainit plot	136	79
<i>Average increase with acid phosphate</i>	122	100
Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	336	224
To cotton seed meal plot	56	71
To acid phosphate plot	88	0
To cotton seed meal and acid phosphate plot.....	120	—16
<i>Average increase with kainit</i>	150	70

Fertilizer Experiments in Tallapoosa and Macon Counties.

Plot No.	FERTILIZER	W. NOTA'GA M. E. Parker 1905		W. NOTA'GA M. E. Parker 1906		W. NOTA'GA J. W. Parker 1907		W. NOTA'GA E. B. Jackson 1907		W. NOTA'GA E. B. Jackson 1908		W. NOTA'GA S. C. Jackson 1905		SHORTER Swearing- ton 1906		
		Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	
1	200	Cotton seed meal....	Lbs. 840	Lbs. 320	Lbs. 748	Lbs. 127	Lbs. 520	Lbs. 104	Lbs. 272	Lbs. 80	Lbs. 680	Lbs. 280	Lbs. 368	Lbs. 72	Lbs. 256	Lbs. 40
2	240	Acid phosphate.....	784	264	810	189	480	64	256	64	500	100	384	88	264	48
3	.....	No fertilizer.....	520	.....	621	.....	416	.....	192	.....	400	.....	296	.....	216	.....
4	200	Kainit.....	848	336	845	224	512	123	216	25	530	112	368	75	544	325
5	200	Cotton seed meal..	896	392	914	293	632	270	296	106	500	84	552	262	464	244
		240															Acid phosphate... }
6	200	Cotton seed meal..	872	376	819	198	584	249	312	124	650	236	520	233	768	546
		200															Kainit.....
7	240	Acid phosphate... }	840	352	810	189	568	260	304	118	550	138	344	60	640	416
		200															Kainit.....
8	.....	No fertilizer.....	480	.....	.....	.....	280	.....	184	.....	410	.....	280	.....	224	.....
9	200	Cotton seed meal..	992	512	898	277	656	376	400	216	680	270	536	256	768	544
		240															Acid phosphate... }
10	200	Cotton seed meal..	1000	520	1026	405	576	296	416	232	720	310	536	256	768	544
		240															Acid phosphate... }
	100	Kainit.....														

TALLAPOOSA COUNTY, 8 1-2 MILES WEST OF NOTASULGA.

J. W. PARKER, 1907. (See Table, p. 61.)

Gray sandy land; yellowish subsoil.

This typical piece of long-leaf pine upland had been cultivated for many years.

The complete fertilizer on plot 10 was the most profitable, affording a net profit of \$6.35 per acre, (376 lbs. at 3.2 cents, less \$5.68).

June and July were very dry. Rust and shedding were severe on plots 5, 9 and 10; plots 4 and 7 retained their foliage remarkably well.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	348
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	104
To acid phosphate plot	206
To kainit plot	126
To acid phosphate and kainit plot.....	116
<i>Average increase with cotton seed meal</i>	138

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	64
To cotton seed meal plot	166
To kainit plot	137
To cotton seed meal and kainit plot.....	127
<i>Average increase with acid phosphate</i>	124

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	123
To cotton seed meal plot	145
To acid phosphate plot	196
To cotton seed meal and acid phosphate plot.....	106
<i>Average increase with kainit</i>	143

TALLAPOOSA COUNTY, 6 MILES WEST OF NOTASULGA.
E. B. JACKSON, 1907-8. (See Table, p. 61.)

Gray sandy upland; yellowish subsoil.

This experiment was made on typical long-leaf pine land, which had been in cultivation for many years. The stands of cotton were good and uniform. There are no records to the presence or absence of cotton rust.

In both years a complete fertilizer was most effective and most profitable. However in a complete fertilizer, 100 pounds of kainit per acre (plot 10) was more advantageous than double this amount, (plot 9.)

	1907	1908
	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	188	405
Increase of seed cotton when cotton seed meal was added:		
To unfertilized plot	80	280
To acid phosphate plot	42	—16
To kainit plot	99	124
To acid phosphate and kainit plot	98	132
<i>Average increase with cotton seed meal</i>	80	130
Increase of seed cotton per acre when acid phosphate was added:		
To unfertilized plot	64	100
To cotton seed meal plot	26	—196
To kainit plot	93	26
To cotton seed meal and kainit plot	92	34
<i>Average increase with acid phosphate</i>	69	—9
Increase of seed cotton per acre when kainit was added:		
To unfertilized plot	25	112
To cotton seed meal plot	44	—44
To acid phosphate plot	54	38
To cotton seed meal and acid phosphate plot	110	186
<i>Average increase with kainit</i>	58	73

MACON COUNTY, 6 MILES WEST OF NOTASULGA.
S. C. JACKSON, 1905. (See Table, p. 61.)

Gray sandy pine woods soil with yellowish subsoil.

The original growth was long-leaf pine. The field had been in cultivation for many years. A mixture of acid phosphate and cotton seed meal (plot 5) was sufficient to give the largest yield and greatest profits.

Mr. Jackson noted that on plots receiving the complete fertilizer there were some spots where the plants died, probably from cotton wilt. This may explain why the complete fertilizer did not give a better yield.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	288
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	72
To acid phosphate plot	174
To kainit plot	158
To acid phosphate and kainit plot	204
<i>Average increase with cotton seed meal</i>	152
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	88
To cotton seed meal plot	190
To kainit plot	—15
To cotton seed meal and kainit plot	31
<i>Average increase with acid phosphate</i>	73
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	75
To cotton seed meal plot	161
To acid phosphate plot	—28
To cotton seed meal and acid phosphate plot	2
<i>Average increase with kainit</i>	52

MACON COUNTY, 9 MILES WEST OF TUSKEGEE.
YANCEY SWEARINGTON, 1906. (See Table, p. 61.)

Gray sandy soil with yellow loam subsoil.

This field was cleared of its growth of long leaf pine about 60 years ago. The stand was good on all plots. It is notable that the complete fertilizer on plot 6 nearly quadrupled the yield on the unfertilized plots. This complete fertilizer afforded the largest yield and the greatest profit. but was closely followed in yield and profit by plot 6, receiving a mixture of cotton seed meal and kainit. In this test kainit was the most useful single fertilizer, a fact which was probably due to its effect in restraining rust, as indicated by Mr. Swearington's careful observations. By July 10 plot 5 was ruined by rust. Plots 4 and 6 suffered least from rust and were the last to show it. The rust was considered worse on plots 9 and 10 than on plot 5. Apparently rust was worse and earlier on plots receiving phosphate.

Mr. Swearington draws the following conclusion from this test:

"Our lands need more liberal use of potash."

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	220
Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot	40
To acid phosphate plot	196
To kainit plot	221
To acid phosphate and kainit plot	184
<hr/>	
<i>Average increase with cotton seed meal</i>	160
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	48
To cotton seed meal plot	204
To kainit plot	91
To cotton seed meal and kainit plot	54
<hr/>	
<i>Average increase with acid phosphate</i>	99

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	325
To cotton seed meal plot	506
To acid phosphate plot	363
To cotton seed meal and acid phosphate plot	356
<i>Average increase with kainit</i>	389

Fertilizer Experiments near Society Hill, Macon County.

Plot No.	FERTILIZER		R. S. FLOYD 1906		R. S. FLOYD 1907		A. B. FLOYD 1908	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal ...	Lbs. 512	Lbs. 160	Lbs. 472	Lbs. 168	Lbs. 420	Lbs. 30
2	240	Acid phosphate	464	112	832	192	580	30
3	....	No fertilizer.....	352	.....	640	.....	450	.....
4	200	Kainit	432	90	720	49	750	296
5	200	Cotton seed meal. }	552	220	1112	410	520	62
	240	Acid phosphate .. }						
6	200	Cotton seed meal. }	448	125	728	-4	610	148
	200	Kainit						
7	240	Acid phosphate .. }	424	111	856	94	550	84
	200	Kainit						
8	....	No fertilizer.....	304	.....	792	.....	470	.....
9	200	Cotton seed meal. }	616	312	1168	376	990	520
	240	Acid phosphate .. }						
	200	Kainit						
10	200	Cotton seed meal. }	554	280	1224	432	900	430
	240	Acid phosphate .. }						
	100	Kainit						

MACON COUNTY, 5 MILES SOUTH WEST OF SOCIETY HILL.

R. S. AND A. B. FLOYD, 1906-7-8.

Soil in 1907 dark sandy loam; in 1906 and 1908 gray sandy soil; yellow subsoil in all experiments.

All these tests were made on land that had been long in cultivation. The original growth is reported as probably short-leaf pine and hardwood.

On gray sandy soil in 1906 and again in 1908 the com-

plete fertilizer was by far the most effective and most profitable application. In both of these years rust was prevalent but least severe on the plots receiving kainia. On the other hand, in 1907, a year in which no rust troubled any plot, a mixture of cotton seed meal and phosphate on plot 5 gave the greatest increase, kainit being practically without effect.

In both years when rust prevailed, plot 10, receiving 200 pounds of kainit in its complete fertilizer, yielded more than plot 10, where only half as much kainit was used in the complete fertilizer.

	1906	1907	1908
	Lbs.	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	328	716	460
Increase of seed cotton when cotton seed meal was added:			
To unfertilized plot	160	—168	—30
To acid phosphate plot	108	218	32
To kainit plot	35	—53	—148
To acid phosphate and kainit plot	201	282	436
<i>Average increase with cotton seed meal</i>	126	70	73

Increase of seed cotton per acre when acid phosphate was added:			
To unfertilized plot	112	192	30
To cotton seed meal plot	60	578	92
To kainit plot	21	45	—212
To cotton seed meal and kainit plot	187	380	372
<i>Average increase with acid phosphate</i>	95	299	71

Increase of seed cotton per acre when kainit was added:			
To unfertilized plot	90	49	296
To cotton seed meal plot	—35	164	178
To acid phosphate plot	—1	—98	54
To cotton seed meal and acid phosphate plot	92	—34	458
<i>Average increase with kainit</i>	37	20	247

BULLOCK COUNTY, 9 MILES EAST OF UNION SPRINGS.

A. M. COPE, 1906. (See Table, p. 69.)

Gray sandy soil with porous yellow sandy subsoil.

The original growth of short-leaf pine had been cleared many years before. The stand of cotton was very uniform. There was need of a complete fertilizer. Of the two complete fertilizers the one containing the larger amount of kainit per acre was more profitable. The need for nitrogen and for phosphate was somewhat greater than for potash.

The increase from the complete fertilizer on plot 9 was 760 pounds per acre, thus affording a net profit of \$18.64 above the cost of fertilizer and above the cost of picking the increase. Indeed every fertilizer, whether used singly or in any combination whatsoever, gave a profitable increase.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	240
Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot	256
To acid phosphate plot	232
To kainit plot	240
To acid phosphate and kainit plot	400
<i>Average increase with cotton seed meal</i>	282
Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	288
To cotton seed meal plot	264
To kainit plot	168
To cotton seed meal and kainit plot	328
<i>Average increase with acid phosphate</i>	262
Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	192
To cotton seed meal plot	176
To acid phosphate plot	72
To cotton seed meal and acid phosphate plot	240
<i>Average increase with kainit</i>	170

Fertilizer Experiments in Bullock, Barbour and Geneva Counties.

Plot No.	FERTILIZER		Union Spgs A. M. COPE		LOUISVILLE		GENEVA	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	200	Cotton seed meal ...	Lbs. 496	Lbs. 256	Lbs. 304	Lbs. 104	Lbs. 736	Lbs. 268
2	240	Acid phosphate	528	288	272	72	640	192
3	....	No fertilizer.....	240	.....	200	.....	448	.....
4	200	Kainit	432	192	232	24	720	265
5	200	Cotton seed meal ..	760	520	456	240	872	410
	240	Acid phosphate ..						
6	200	Cotton seed meal ..	672	432	472	248	720	252
	200	Kainit						
7	240	Acid phosphate ..	600	360	312	80	624	150
	200	Kainit						
8	....	No fertilizer.....	240	.....	240	.....	480	.....
9	200	Cotton seed meal ..	1000	760	456	216	920	440
	240	Acid phosphate ..						
	200	Kainit						
10	200	Cotton seed meal ..	808	568	480	240	872	392
	240	Acid phosphate ..						
	100	Kainit						

BARBOUR COUNTY, 3 MILES NORTH OF LOUISVILLE.

BY J. D. VEAL, 1905.

Gray, sandy soil, with stiffer gray subsoil.

This field had been long in cultivation.

The season was wet; rust was severe and all yields were small. Nitrogen afforded a larger increase than did phosphate or potash. The most profitable mixtures contained cotton seed meal, mixed either with acid phosphate or with kainit.

The year before, on the same or similar land, a complete fertilizer was the most profitable. Both years cotton seed meal and acid phosphate were needed.

In 1904 kainit was profitably used, giving an average increase of 100 pounds per acre, as compared with an average increase of only 38 pounds in 1905.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	220
Increase of seed cotton per acre when cotton seed meal was added:	
To unfertilized plot	104
To acid phosphate plot	168
To kainit plot	224
To acid phosphate and kainit plot	136
<i>Average increase with cotton seed meal</i>	158

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	72
To cotton seed meal plot	136
To kainit plot	56
To cotton seed meal and kainit plot	32
<i>Average increase with acid phosphate</i>	58

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	24
To cotton seed meal plot	144
To acid phosphate plot	8
To cotton seed meal and acid phosphate plot	24
<i>Average increase with kainit</i>	38

GENEVA COUNTY, 4 1-2 MILES NORTH OF GENEVA
M. P. METCALF, 1905.

*Gray sandy pine land with stiffer red subsoil eight inches
from surface.*

The land had been in cultivation six years. Both cotton seed meal and acid phosphate were very effective, and a mixture of the two was the most profitable fertilizer. This year kainit was in most combinations useless.

In experiments on cotton made by Mr. Metcalf on similar land in preceding years the results indicated a need for phosphate; and in two of his experiments kainit was also very effective. Nitrogen was also needed except when supplied by a preceding crop of peanuts.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	464
Increase of seed cotton when cotton seed meal was added:	
To unfertilized plot	288
To acid phosphate plot	218
To kainit plot	—13
To acid phosphate and kainit plot	290
<hr/>	
<i>Average increase with cotton seed meal</i>	196

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	192
To cotton seed meal plot	122
To kainit plot	—115
To cotton seed meal and kainit plot	188
<hr/>	
<i>Average increase with acid phosphate</i>	97

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	265
To cotton seed meal plot	—36
To acid phosphate plot	—42
To cotton seed meal and acid phosphate plot	30
<hr/>	
<i>Average increase with kainit</i>	54

HENRY COUNTY, 3 1-2 MILES NORTH OF COLUMBIA.
THOS. Z. ATKESON, COLUMBIA, 1908.

Light gray soil with yellow loamy subsoil.

The field had been cleared about 40 years, the principal growth having been long leaf pine. There was very little rain from the time the seed were planted, and cotton wilt and root knot further reduced the yield under these unfavorable conditions. All fertilizers increased the yield, but none to any large extent.

Yet the increase on plot 5 was sufficient to pay a fair profit over the cost of the fertilizer.

	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i>	94
Increase of seed cotton when cotton seed was added:	
To unfertilized plot	785
To acid phosphate plot	96
To kainit plot	254
To acid phosphate and kainit plot	148
<hr/>	
<i>Average increase with cotton seed meal</i>	144

Increase of seed cotton per acre when acid phosphate was added:	
To unfertilized plot	35
To cotton seed meal plot	54
To kainit plot	74
To cotton seed meal and kainit	32
<hr/>	
<i>Average increase with acid phosphate</i>	48

Increase of seed cotton per acre when kainit was added:	
To unfertilized plot	33
To cotton seed meal plot	209
To acid phosphate plot	72
To cotton seed meal and acid phosphate plot	124
<hr/>	
<i>Average increase with kainit</i>	109

Fertilizer Experiments in Henry County.

Plot No.	FERTILIZER		COLUMBIA		HEADLAND 1907		HEADLAND 1908	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal ...	Lbs. 173	Lbs. 78	Lbs. 392	Lbs. 80	Lbs. 1015	Lbs. 130
2	240	Acid phosphate	130	35	208	104	1130	245
3	....	No fertilizer.....	95	.....	312	.....	885	.....
4	200	Kainit	128	33	424	105	1020	150
5	200	Cotton seed meal .	225	131	416	90	1245	390
	240	Acid phosphate ..						
6	200	Cotton seed meal .	380	287	656	324	1130	290
	200	Kainit						
7	240	Acid phosphate ..	200	107	536	198	1170	345
	200	Kainit						
8	....	No fertilizer.....	93	.....	344	.....	810	.....
9	200	Cotton seed meal .	3485	255	656	312	1425	615
	240	Acid phosphate ..						
	200	Kainit						
10	200	Cotton seed meal .	408	305	600	256	1410	600
	240	Acid phosphate ..						
	100	Kainit						

HENRY COUNTY, 1 MILE EAST OF HEADLAND.

W. F. COVINGTON, 1907-8.

Gray sandy soil with yellow loam subsoil.

In 1907.—The experiment in 1907 was made on land that had been cleared about 40 years and was very poor, but otherwise representative.

The crop in 1906 was cotton fertilized with 500 to 600 pounds of a 9-3-3 guano. This probably explains in part why there was such poor response in 1907 to applications of phosphate. A further explanation is doubtless found in the observed fact that rust was worse on plot 2, fertilized with acid phosphate alone, than on other plots. Cotton seed meal and kainit both profitably increased the yield in whatever combination they were applied. The largest yield was made by a mixture of cotton seed meal and

kainit, on plot 6. Mr. Covington writes: "The kainit made good in every test, especially so on plots 4, 6, and 7. On these plots the leaves held longer and the bolls were larger and much better matured, this last being especially noticeable on plot 6."

In 1908. The field had been cleared about ten years. On this land, not so deficient in vegetable matter as that used the preceding year, a complete fertilizer gave the maximum yield and the maximum profit. Of the three constituents of the complete fertilizer, acid phosphate was most influential, closely followed by both of the others. It is notable that the complete fertilizer on plot 10, containing only 100 pounds of kainit, in addition to meal and phosphate, afforded almost as large a yield and a greater net profit than did the complete fertilizer on plot 9, which contained double this amount of kainit. The net profit due to 540 pounds of fertilizer on plot 10 was \$14.27 (600 lbs. at 3.2 cents, less \$4.93) per acre.

Apparently this soil needs a complete fertilizer and this conclusion is not shaken by the slight response to acid phosphate under the exceptional conditions of 1907, as stated above; this view is strengthened by the favorable results from complete fertilizers in earlier experiments on what seem to be similar soils in that part of the state.

	Lbs. Lbs.	
	1907.	1908.
<i>Average yield of seed cotton per acre, unfertilized</i>	328	848
Increase in seed cotton when cotton seed meal was added:		
To unfertilized plot	80	130
To acid phosphate plot	194	145
To kainit plot	219	140
To acid phosphate and kainit plot	114	270
<i>Average increase with cotton seed meal</i>	152	172

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

To unfertilized plot	—104	245
To cotton seed meal plot	10	260
To kainit plot	93	195
To cotton seed meal and kainit plot	—12	325
<i>Average increase with acid phosphate</i>	<i>—3</i>	<i>256</i>

Increase of seed cotton per acre when kainit was added:

To unfertilized plot	105	150
To cotton seed meal plot	244	160
To acid phosphate plot	302	100
To cotton seed meal and acid phosphate plot	222	225
<i>Average increase with kainit</i>	<i>218</i>	<i>159</i>

Experiments at Betts, Conecuh County.

Plot No.	FERTILIZER		BETTS 1905		BETTS 1906		BETTS 1907	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Lbs. 200	Cotton seed meal...	Lbs. 784	Lbs. 216	Lbs. 1048	Lbs. 168	Lbs. 440	Lbs. 56
2	240	Acid phosphate	792	224	1064	184	424	40
3	...	No fertilizer	568	.....	880	.....	384	.....
4	200	Kainit	704	139	920	37	392	9
5	200	Cotton seed meal .	864	302	1080	193	456	74
	240	Acid phosphate ..						
6	200	Cotton seed meal .	832	273	1056	166	456	76
	200	Kainit						
7	240	Acid phosphate ..	824	269	1040	147	440	62
	200	Kainit						
8	...	No fertilizer	552	.....	896	.....	376	.....
9	200	Cotton seed meal .	896	344	1216	320	464	88
	240	Acid phosphate ..						
10	200	Kainit	880	328	1200	304	456	80
	240	Acid phosphate ..						
	100	Kainit						

CONECUH COUNTY, 1-2 TO 1 1-2 MILES NORTH EAST OF BETTS.

R. H. BETTS, 1905-6-7.

Gray sandy soil with red subsoil.

The land on which these tests were made had been cleared for 30 or 40 years. The original growth was reported hardwood and short-leaf pine; if so, probably this soil is different from the average soil of the long-leaf pine belt.

In 1908 there was so much rain and such small yields that all fertilizers were about equally ineffective and unprofitable. In 1906 when both fertilized and unfertilized plots yielded well, complete fertilizer (on plots 9 and 10) afforded the largest net profit. In 1905 a mixture of cotton seed meal and acid phosphate was nearly as effective and quite as profitable as a complete fertilizer.

	1905	1906	1907
	Lbs.	Lbs.	Lbs.
<i>Average yield of seed cotton per acre, unfertilized</i> ..	560	888	380
Average yield of seed cotton when cotton seed meal was added:			
To unfertilized plot	216	168	56
To acid phosphate plot	78	9	34
To kainit plot	134	130	67
To acid phosphate and kainit plot	75	173	26
<i>Average increase with cotton seed meal</i>	126	120	46
Increase of seed cotton per acre when acid phosphate was added:			
To unfertilized plot	224	184	40
To cotton seed meal plot	86	25	18
To kainit plot	130	111	53
To cotton seed meal and kainit plot	71	154	12
<i>Average increase with acid phosphate</i>	127	119	31
Increase of seed cotton per acre when kainit was added:			
To unfertilized plot	139	36	9
To cotton seed meal plot	57	—2	20
To acid phosphate plot	45	—37	22
To cotton seed meal and acid phosphate plot	42	127	14
<i>Average increase with kainit</i>	71	31	16

INCONCLUSIVE TESTS.

The following inconclusive experiments were made:

Bullock County, O. M. Hill, Suspension, 1906.

Bullock County, F. B. Haynes, 7 miles South of Union Springs, 1908.

Chambers County, E. W. Smart, Fredonia, 1905.

Fayette County, J. B. Gibson, Newtonville, 1908.

Pickens County, D. W. Davis, Gordo, 1906.

The yields in these tests are given in the next table.

Inconclusive Experiments in Bullock, Chambers, Fayette, Montgomery and Pickens Counties.

Plot No.	FERTILIZER		SUSPENSION 1906		UNION SPRINGS Haynes, '08		FREDONIA 1905		NEWTON- VILLE 1907		NEWTON- VILLE 1908		NAFTEL 1905		GORDO 1906	
	Amount per acre	KIND	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot	Yield of seed cotton per acre	Increase over unfertilized plot
1	Sbs.		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
2	200	Cotton seed meal ...	808	16	450	150	816	728	1090	650	336	450	72	608	880	256
3	240	Acid phosphate ...	872	48	580	20	888	200	1080	640	408	144	488	48	752	128
4	200	No fertilizer.....	824	.....	600	.....	688	.....	440	.....	264	.....	536	.....	624	.....
5	200	Kainit	856	37	740	180	912	152	1200	684	280	19	688	187	608	29
6	200	Cotton seed meal.	1088	274	570	50	768	64	1320	728	272	14	336	130	688	38
7	240	Acid phosphate ..	984	175	630	150	192	288	1080	412	232	23	560	129	936	273
8	200	Cotton seed meal.	1000	195	540	100	1376	400	980	230	208	44	656	260	672	4
9	200	Kainit	800	.....	400	.....	1048	.....	820	.....	248	.....	360	.....	688	.....
10	200	No fertilizer.....	800	.....	400	.....	1048	.....	820	.....	248	.....	360	.....	688	.....
11	200	Cotton seed meal.	960	160	450	50	1256	208	1380	560	256	8	664	304	824	136
12	240	Acid phosphaaate ..	1224	424	390	10	1096	48	1340	520	232	16	712	352	848	160
13	200	Kainit														
14	200	Cotton seed meal.														
15	240	Acid phosphate ..														
16	200	Kainit														
17	200	Cotton seed meal.														
18	240	Acid phosphate ..														
19	100	Kainit														