

BULLETIN NO. 130.

JANUARY, 1905.

ALABAMA

# Agricultural Experiment Station

OF THE

Alabama Polytechnic Institute

AUBURN

---

## Tests of Varieties of Cotton

IN 1904

---

By

J. F. DUGCAR

Director and Agriculturist.

---

Opelika, Ala.:

The Post Publishing Company.

1905.

---

COMMITTEE OF TRUSTEES ON EXPERIMENT STATION.

J. M. Carmichael.....Montgomery  
T. D. Samford.....Opelika  
W. C. Davis.....Jasper.

STATION COUNCIL.

C. C. Thach.....President.  
J. F. Duggar.....Director and Agriculturist.  
B. B. Ross.....Chemist and State Chemist.  
C. A. Cary.....Veterinarian.  
E. M. Wilcox.....Plant Physiologist and Pathologist.  
R. S. Mackintosh.....Horticulturist and State Horticulturist.  
J. T. Anderson...Chemist in Charge of Soil and Crop Investigations.

ASSISTANTS.

C. L. Hare.....First Assistant Chemist.  
T. Bragg.....Second Assistant Chemist.  
C. M. Floyd.....Superintendent of Farm.  
I. S. McAdory.....Assistant in Veterinary Science.  
N. C. Rew.....Assistant in Animal Industry  
C. T. Kinman.....Assistant in Horticulture

The Bulletins of this Station will be sent free to any citizen of the State on application to the Agricultural Experiment Station, Auburn, Alabama.

---

## VARIETY TESTS OF COTTON IN 1904.

---

BY J. F. DUGGAR.

---

The season of 1904 presented some trying conditions for the cotton plant. The rainfall for March was below normal. April was exceedingly dry and the drought was not broken until late in May. The total rainfall for March was 2.80 inches; for April 1.02 inches; and for the first four weeks in May, less than .75 of an inch. These conditions resulted in stands by no means as uniform as is desirable in experimental work.\*

The wet weather of July and the heavy rains of the early part of August resulted in a vigorous growth of the cotton plant and a promise of a large crop. From the latter part of August until the date of the first light frost there was practically no rain. At Auburn the rainfall for September was only .26 of an inch; for October .02, and for November 2.28 inches.

The extreme of wet weather in August, followed by very dry weather in September, resulted in the shedding of an unusually large proportion of forms. The shedding of forms by different varieties, and under different conditions, has been the subject of a co-operative investigation both at Auburn and in Montgomery county begun jointly in 1904 by this station and the Division of Vegetable Pathological and Physiological Investigations of the United States Department of Agriculture. Of course a repetition of that

---

\*The writer desires to express here his grateful appreciation of the valuable assistance in these experiments afforded by Dr. J. T. Anderson, who furnished the rainfall record; Mr. C. M. Floyd, who had charge of the field work at Auburn; Mr. C. H. Billingsley, of the United States Department of Agriculture, who furnished the data for indicating the relative earliness of varieties, and to Mr. C. R. Hudson, who is responsible for most of the calculations.

experiment for several seasons will be needed before conclusive data for publication can be expected.

A light frost occurred late in October and the first killing frost occurred November 14, the latter killing a number of small bolls.

#### YIELDS OF VARIETIES IN PLOTS AT AUBURN.

The field on which these tests were made is known as the ten-acre field. It has a reddish loam soil with a considerable proportion of flinty stones. It is regarded as upland of somewhat better than average quality because of the occasional growing of a crop of cow peas for hay. Every fifth plot throughout most of the field was planted with the Culpepper variety to ascertain if there were any decided inequalities in the fertility of the land.

The land was plowed broadcast with a two-horse plow late in March, and bedded and fertilized just before planting, which occurred April 20th.

The fertilizer per acre consisted of:

- 64 lbs. nitrate of soda.
- 120 lbs. cotton seed meal.
- 240 lbs. acid phosphate.
- 64 lbs. muriate of potash.

---

488 lbs., total per acre.

For three or four weeks after planting only an occasional seed sprouted, the ground being loose and very dry. Then a roller was run over the field to press the seed into closer contact with the soil, and this was immediately followed by the weeder, a light form of harrow, used to check evaporation. Within a week, and as a result of this rolling and harrowing, a fairly good stand of cotton was in sight, although the weather continued very dry. The plants were so thinned that they averaged, on the plots with perfect stands 18 1-2 inches apart with rows 3 1-2 feet wide. Only one variety, Gold Standard, had such a poor stand as to seri-

ously affect its yield and to necessitate its exclusion from the following table. A careful study of the detailed records led to the conclusion that the yields were not materially affected by the slight deficiencies in stand, though it is possible that the varieties Doughty, with 76 per cent. of a stand, Texas Burr, with 84 per cent., and Truitt, with 86 per cent., might have stood a few points higher if the stand had been perfect. It was concluded that any effort to calculate the probable yields with perfect stands, would, in this case, involve a greater error than is incurred in giving the actual yields without this correction for slight deficiencies in stand.

The following table gives the actual yield of seed cotton, lint, and seed, all these weights being taken at the gin house a number of weeks after the two heaviest pickings had been made, thus permitting all varieties to dry out to a somewhat uniform degree. In the same table are two columns giving the value of the total product of seed and lint per acre, based, in one column, on a price of ten cents per pound for lint, and in the other column on a price of seven cents per pound, the seed in both columns being valued at seventy cents per 100 pounds. These may be called high and low prices. Readers who prefer other prices can substitute their own figures and make their own calculations.

*Yields of lint and seed of 38 varieties of cotton on Station Farm at Auburn in 1904 and value of the crop per acre.*

Rank in value of product	VARIETY.	Stand of plants	Actual yield per acre of			Value of seed and lint per acre. 10c for lint.*	Value of seed and lint Per acre. 7c for lint.*	
			Seed cotton	Lint	Seed			
			%	Lbs.	Lbs.	Lbs.	\$	\$
1	Peterkin		100	1624	628	993	\$69.75	\$50.91
2	Layton Improved		92	1632	620	1011	69.07	50.47
3	Jackson		100	1584	607	974	67.51	49.31
4	Alex. Allen		92	1673	581	1088	65.71	48.28
5	Wise		94	1481	556	905	61.93	45.25
6	Cameron Early		100	1558	546	1009	61.66	45.28
7	Simms Long Staple		100	1675	539	1065	61.35	45.18
8	Pullnot		97	1542	543	963	61.94	44.75
9	Cook Improved		100	1403	548	852	60.76	44.32
10	Doughty Improved		76	1336	522	997	59.18	43.52
11	Allen Long Staple		94	1610	498	1120	57.64	42.70
12	Culpepper		96	1486	508	965	57.56	42.32
13	Texas Burr		84	1488	502	980	57.06	42.00
14	Willett Red Leaf		95	1352	503	840	56.18	41.09
15	Hawkins		100	1332	487	839	54.54	39.93
16	King		100	1396	484	861	54.42	39.90
17	(Lewis) Prize		92	1297	486	804	54.22	39.76
18	Russell		100	1431	473	952	53.96	39.77
19	Nancy Hanks		98	1401	474	916	53.81	39.59
20	Drake		100	1412	467	942	53.29	39.37
21	Mascot		100	1292	476	811	53.27	38.99
22	Shine		94	1368	465	895	52.76	38.81
22	Sam Woodfin Prolific		97	1400	463	924	52.76	38.87
23	Jones Improved		100	1392	462	927	52.68	38.82
24	Truitt		86	1348	462	872	52.30	38.44
25	Schley		100	1324	457	862	51.73	38.02
26	Grier's King		96	1248	459	774	51.31	34.54
27	Edgeworth		100	1288	453	829	51.10	37.51
28	Garrard		89	1225	453	765	50.65	37.06
29	Johnson's Excelsior		100	1230	442	785	49.69	36.43
30	Pride of Georgia		100	1276	436	839	49.47	36.39
31	Meredith		92	1288	434	846	49.32	36.30
32	Mortgage Lifter		100	1288	433	841	49.18	36.19
33	Floradora		100	1296	420	875	48.12	35.52
34	Parker		100	1196	408	785	46.29	34.05
35	Blue Ribbon (fuzzy seed)		100	1225	401	813	45.79	33.76
36	Sunflower		100	1228	401	812	45.78	33.75
37	Blue Ribbon (black seed)		100	1203	379	818	43.62	32.27
38	Lealand		95	1144	378	765	43.15	31.31

\*Seed 70 cents per 100 lbs. or \$14.00 per ton.

The largest yield was made by Peterkin, closely followed by Layton, Jackson and Alex. Allen. Wise occupies fifth place.

Grouping together such of the varieties as the writer has up to this time definitely classified in accordance with the classification outlined by him in Bulletin No. 107 of the Alabama Experiment Station, and neglecting groups of varieties having few representatives in this test, we have average results that are significant, as below:

## Average yields of Classes of varieties at Auburn in 1904.

	Lint per acre	Seed per acre	Value per acre at 10c and \$14.00	Relative yields of lint
<b>Semi-Cluster Group</b>		<i>Lbs.</i>		
Hawkins .....	487	839	\$54.54	
Drake .....	467	942	53.29	
Woodfin .....	463	924	52.76	
Garrard .....	453	765	50.65	
Average .....	468	867	\$52.81	78
<b>Peterkin Type.</b>				
Peterkin .....	628	993	\$69.75	
Layton .....	620	1011	69.04	
Wise .....	556	905	61.93	
Average .....	601	936	\$66.91	100
<b>King Type.</b>				
King .....	484	861	\$54.42	
Mascot .....	477	811	53.27	
Shine .....	465	895	52.76	
Grier's King .....	459	774	51.31	
Average .....	471	835	\$52.94	78
<b>Big Boll Type.</b>				
Culpepper .....	508	965	\$57.56	
Texas Burr .....	502	980	57.06	
Russell .....	473	952	53.96	
Jones Improved .....	462	927	52.68	
Truitt .....	462	872	52.30	
Schley .....	457	862	51.73	
Pride of Georgia .....	436	839	49.47	
Mortgage Lifter .....	433	841	49.18	
Average .....	466	905	\$54.79	77
<b>Long Staple Group.</b>				
Floradora .....	420	875	\$48.12	
Sunflower .....	401	812	45.78	
Blue Ribbon (fuzzy seed) .....	401	813	45.79	
Blue Ribbon (black seed) .....	379	818	43.62	
Average .....	400	829	\$46.08	66



From the above table it will be seen that the Peterkin and varieties having similar qualities were decidedly in the lead at Auburn in 1904 in the production of lint. Taking the yield of lint made by the Peterkin group as 100, we find that the average relative yield of the semi-cluster group may be represented by 78; of the King type by 78; of the big boll group by 77; and of the long staple group by 66. This throws some light on the question of the difference in productiveness on upland soils of the long staple varieties as compared with the other groups. The varieties Allen long staple and Simms long staple are not included in this average for the reason that they grew on the lowest, and doubtless the richest, plots in the field.

The local markets usually pay little or no premium for the long staple varieties, which, however, command a premium of several cents a pound in the larger southern seaport markets. This year at Auburn for the four long staple varieties to have nearly equaled the Peterkin group in value per acre it would have been necessary for long staple lint to sell for 15 cents per pound when Peterkin was 10 cents, or for 10 1-2 cents when Peterkin was worth 7 cents. If we compare the long staple with either of the other groups a much smaller premium would equalize the values. Long staple cotton should have rich bottom land for its best development.

While the Peterkin group is ahead this year, it by no means follows that it will maintain its lead when seasonal conditions and soils are different.

PER CENT. OF LINT IN VARIETIES TESTED IN PLOTS AT AUBURN  
IN 1904.

During a study of cotton varieties extending over a number of years a large amount of data have been obtained regarding the proportions of seed and lint of 175 or more varieties which have recently been grown. The following table gives only so much of this data as was obtained in 1904,

by ginning the cotton on these plots of which the yields are reported in the first table of this bulletin.

*Per cent of lint in plot tests at Auburn in 1904.*

<i>Variety</i>	<i>Per Cent Lint</i>	<i>Variety.</i>	<i>Per Cent Lint</i>
1 Cook Improved .....	39.1	Parker .....	34.1
2 Gold Standard .....	38.9	Doughty .....	34.0
3 Peterkin .....	38.7	Pride of Georgia .....	34.0
4 Jackson .....	38.3	Shine .....	34.0
5 Wise .....	37.6	Nancy Hanks .....	33.8
6 Prize .....	37.4	Meredith .....	33.7
7 Willett Red Leaf .....	37.2	Texas Burr .....	33.7
8 Garrard .....	37.0	Mortgage Lifter .....	33.4
9 Grier's King .....	36.8	Jones Improved .....	33.2
10 Mascot .....	36.8	Sunflower .....	33.1
11 Hawkins .....	36.5	Drake .....	33.1
12 Johnson's Excelsior ..	36.0	Russell .....	33.1
13 King .....	35.9	Lealand .....	33.0
14 Alex. Allen .....	35.3	Sam Woodfin Prolific ...	33.0
15 Edgeworth .....	35.2	Blue Ribbon (fuzzy seed)	32.8
16 Pullnot .....	35.2	Floradora .....	32.4
17 Cameron Early .....	35.0	Simms Long Staple .....	32.1
18 Schley .....	34.6	Blue Ribbon (black seed)	31.5
19 Culpepper .....	34.3	Allen Long Staple .....	30.8
20 Truitt .....	34.3		

It will be noted that the proportion of lint to seed is unusually high. This was also the case in the variety tests at the Georgia station in 1904, as indicated in a recent newspaper article by Director R. J. Redding. This concordance of results suggests that something in the climatic conditions of 1904 was favorable to the increase of lint or to the relative decrease of seed.

It will be noted that the long staple varieties have much lower percentages of lint than most of the short staple varieties.

VARIETY TESTS ON PRAIRIE SOIL IN MONTGOMERY COUNTY IN 1904.

Through co-operation with the United States Department of Agriculture as before stated, we are this year enabled to

print the results of a variety test made on the A. H. Clarke plantation about half a mile northeast of the depot at McGehee's Switch station, Montgomery county.

The soil is gray prairie upland of about average quality, not recently fertilized, so far as is known, until the present year. Planting was done April 29-30. On June 1, fertilizers as below were applied on the side of the row in the shallow furrow made by the first cultivation. The fertilizer was then covered by the throwing out of the middles. The fertilizer used consisted of:

200 lbs. acid phosphate per acre.

200 lbs. kainit per acre.

100 lbs. nitrate soda per acre.

This date of application was doubtless too late for good results for this season and on this soil, as shown not only in variety tests, but in fertilizer tests on another part of the same field. Through a misunderstanding the plots were not thinned to a uniform stand, but it was found that the yield of three plots of Truitt did not vary greatly with variations in the stand. As it was impracticable to gin the seed cotton of each plot separately at McGehee's, the yield of lint is obtained by multiplying the weight of seed cotton by the per cent. of lint found in the variety test at Auburn in 1904.

*Fields of varieties of cotton at McGehee's Switch, Ala.,  
in 1904.*

Plot No.	Rank in value of products	VARIETY.	No of plants per acre.	Yield per acre.			*Value of seed and lint per acre. 10c for lint.	*Value of seed and lint per acre. 7c for lint.
				Seed cotton.	Lint	Seed.		
				Lbs.	Lbs.	Lbs.	\$	\$
18	1	Schley .....	7070	830	287	543	32.50	23.89
14	2	Peterkin .....	6390	750	290	460	32.22	23.52
22	3	Drake .....	6500	690	228	360	31.23	24.39
23	4	Crossland .....	5750	770	277	493	31.15	22.84
17	5	Toole .....	6410	790	270	520	30.72	22.62
1	6	King .....	5630	730	262	468	29.47	21.61
21	7	Bancroft Herlong ...	6800	800	256	544	29.41	21.73
Av. 5, 10 and 15	8	Truitt .....	5947	746	256	492	29.03	21.35
20	9	Simms .....	7630	750	241	509	27.66	20.43
16	10	Floradora .....	6100	720	233	487	26.70	19.71
11	11	Hawkins .....	5910	620	226	394	25.35	18.57
2	12	Russell .....	5670	650	215	435	24.54	18.09
12	13	Cook Long Staple....	5830	680	207	473	24.05	17.84
19	14	Doughty Long Staple	6910	600	204	396	23.17	17.05
7	15	Jackson .....	5800	540	207	333	23.03	17.82
4	16	Parker .....	6000	560	190	370	21.59	15.89
3	17	Sunflower .....	6360	560	185	375	21.12	15.57
6	18	Pride of Georgia ...	5520	530	180	350	20.45	15.05
8	19	Mortgage Lifter ....	5000	500	167	333	19.03	14.02
13	20	Allen Long Staple ..	6040	500	154	346	17.82	13.20

\*Seed valued at 70 cents per 100 pounds or \$14.00 per ton.

The varieties affording the largest value of seed and lint were Schley and Peterkin, closely followed by Drake and Crossland. Toole stands fifth. In this test, as at Auburn, the varieties of the Peterkin type, namely, Peterkin and Crossland stand well to the front with an average yield of 283 1-2 pounds of lint per acre. Taking this yield of lint as 100 per cent., the groups of varieties hitherto classified average as follows:

Peterkin group (Peterkin and Crossland) .....	100.
Big boll group (Russell, Schley, Truitt, Pride of Georgia, and Mortgage Lifter) .....	78.

Semi-cluster group (Hawkins and Drake) . . . . .	69.
Long staple group (Floradora, Cook, Long Staple, Doughty, Sunflower, and Allen long staple), . . . . .	69.

#### RELATIVE EARLINESS OF VARIETIES.

The invasion of the cotton states by the cotton boll weevil renders more important than ever before careful studies of the early varieties. It has been found that only the earliest varieties can be profitably grown in infested regions, even when all other known methods of combatting the weevil are employed.

The rapid spread of the weevil eastward in Louisiana during the past season makes it important that the farmers of Alabama should be ready for this invasion as promptly as possible. It would be well for every neighborhood, and perhaps for every farm, to have at least a small portion of its crop in one of the very early varieties so that seed of early varieties may be everywhere available when urgently needed.

It is easy to determine at a glance that one variety is early and another late, but it is less easy to indicate the relative earliness of intermediate varieties. In the two tables which follow the figures show how many bolls had opened on a given date early in September out of every 100 bolls maturing during the entire season.

These figures are based on counts of bolls on five selected plants of each variety made by Mr. C. H. Billingsley, of the United States Department of Agriculture.

*Relative earliness of varieties at Auburn in 1904, as shown by per cent of bolls open on September 1 on counted plants.*

<i>Variety.</i>	<i>Per cent bolls open Sept. 1</i>	<i>Variety.</i>	<i>Per cent bolls open Sept. 1</i>
King .....	82	Jones Improved .....	20
Mascot .....	77	Schley .....	19
Mereditb .....	49	Sunflower .....	19
Garrard .....	47	Gold Standard .....	19
Grier's King .....	46	Parker .....	18
Lealand .....	44	Blue Ribbon (wooly seed) .....	17
Nancy Hanks .....	44	Alex. Allen .....	16
Shine .....	42	Woodfin .....	16
Jackson .....	41	Culpepper .....	15
Hawkins .....	35	Blue Ribbon (black seed) .....	15
Layton .....	34	Peterkin .....	15
Johnson Excelsior .....	33	Doughty .....	14
Edgeworth .....	32	Russell .....	14
Texas Burr .....	32	Pullnot .....	14
Pride of Georgia .....	31	Floradora .....	14
Cameron Early .....	31	Mortgage Lifter .....	13
Cook Improved .....	30	Simms Long Staple .....	13
Drake .....	25	Allen Long Staple .....	12
Wise .....	22	Truitt .....	10
Prize .....	21	Cook Long Staple .....	7
		Willett Red Leaf .....	6

*Relative earliness of varieties at McGehee's as shown by per cent of bolls open on September 7, 1904.*

<i>Variety.</i>	<i>Per cent bolls open Sept. 7</i>	<i>Variety.</i>	<i>Per cent bolls open Sept. 7</i>
Toole .....	81	Truitt .....	23
King .....	66	Crossland .....	23
Simms .....	39	Pride of Georgia .....	23
Mortgage Lifter .....	33	Cook Long Staple .....	18
Allen Long Staple .....	32	Peterkin .....	17
Sunflower .....	27	Floradora .....	15
Jackson .....	27	Doughty .....	14
Parker .....	25	Hawkins .....	13
Russell .....	25	Drake .....	12
Schley .....	24	Bancroft .....	7

The above tables are based on careful counts made on five plants of each variety. Since individual peculiarities of some of these plants have greatly affected the positions in the table, it is in place to say that judging only by the general appearance of the plots the varieties matured more nearly together than indicated by the table and at Auburn the following varieties especially appeared earlier than is indicated by their positions in the tables: Alex. Allen, Woodfin, and Culpepper.

#### WHERE TO GET SEED.

The experiment station is unable to supply seed of any of these varieties. In order to enable farmers to obtain seed of such of these varieties as they desire, addresses are given below of parties from whom our seed were obtained in 1904:

Culpepper from J. E. Culpepper, Luthersville, Ga.

Drake from R. W. Drake, Laneville, Ala.

Cook Improved from J. R. Cook, Schley, Ga.

Edgeworth from J. C. Little, Louisville, Ga.

Blue Ribbon from S. C. Experiment Station, Clemson College, S. C.

Gold Standard from Excelsior Seed Farm, Bennettsville, S. C.

Sam Woodfin Prolific from S. V. Woodfin, Marion, Ala.

Parker, Sunflower, Russell, Mortgage Lifter, King and Jackson from United States Department of Agriculture, Washington, D. C.

Truitt and Peterkin from Harvey Seed Co., Montgomery, Ala.

Simms, Allen Long Staple, Willett Red Leaf, Doughty Long Staple, Cook Long Staple, Floradora, Hawkins, Jones Improved and Schley from N. L. Willett Drug Co., Augusta, Ga.

Pride of Georgia, Cameron Early, Layton Improved, Meredith, Nancy Hanks, Garrard, Grier's King, Mascot, Shine,

Texas Burr, Prize, Wise, Alex. Allen, and Pullnot from the Georgia Experiment Station, Experiment, Ga.

Lealand from H. P. Jones, Herndon, Ga.

Johnson Excelsior from C. R. Baird & Co., Chattanooga, Tenn.

#### OTHER EXPERIMENTS IN PROGRESS WITH VARIETIES OF COTTON.

This bulletin relates to only about half of the varieties grown on the experiment station farm at Auburn in 1904. The space available was not sufficient for the remaining varieties to be grown on areas large enough to afford accurate determinations of the yields.

The remaining varieties, grown on very small areas, as well as the varieties here reported, constitute part of an experiment, the main object of which is to obtain accurate descriptions and photographs of every variety obtainable east of the boll weevil region. It will require at least another year before results can be published; meantime, this experiment will be continued in 1905, and for use in this experiment the writer will be glad to obtain by mail from growers or originators small packages of seed of the well established variety which each is growing. The senders are requested to exercise care in fully labeling the package on the outside, giving the name and postoffice of the sender and the true establishel name of the variety.

Our thanks are hereby extended to all of those who in the past few years have furnished small lots of seed for this experiment. I would repeat here the statement which I have made every spring in the circular letters sent to growers. *From the nature of the experiment no report can be made by letter as to how any variety stands.* However, it is the intention to send to each contributor of seed a copy of the bulletin that will be published when the investigation is completed.