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EXPERIMENT STATION,  
Division of Horticulture.

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Report of Cotton Experiments at  
The Holly Springs Branch  
Experiment Station

SEASONS 1919 AND 1920

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BY C. T. AMES



THE MISSISSIPPI  
AGRICULTURAL AND MECHANICAL COLLEGE

J. R. RICKS  
DIRECTOR



# COTTON EXPERIMENTS

## At the Holly Springs Branch Experiment Station Season 1919 and 1920

BY C. T. AMES.

The Holly Springs Branch Experiment Station has been carrying on certain cotton experiments for a number of years to obtain information that would be of value to cotton growers in North Mississippi and especially to those living in the brown loam soil belt of the State. Until 1919 the results were published each year in a general cotton bulletin issued by the College station and branch stations jointly. With the increase in experimental data collected and increased cost of printing, it was thought best to publish the reports separately. By doing this economy is practiced in that a grower in any particular section of the State can be furnished only the data in which he is especially interested.

This bulletin contains Holly Springs weather records for 1919 and 1920, results from variety studies on hill and valley land, fertilizer tests, and spacing tests for those years. Suggestions for cotton culture in the brown loam soil belt are also made.

### THE WEATHER.

The season of 1919 was the most unsatisfactory within the memory of the writer. The weather was very wet during the spring and summer, very dry during mid-summer, and wet during the fall at picking time. No boll weevils appeared at any time during the season. All of the varieties were more or less injured by blight.

In the season of 1920, the average mean temperature was lower than that of 1919, and the precipitation above the general average. Precipitation was 4.71 inches above normal in April; 2.20 in May; 2.70 in June; and .60 inches below normal in July; 1.21 below in August, and .88 below in September. Where good stands were secured and good cultivation given during May and June, good yields were secured. The season was near normal during July, August, and September. Boll weevils were plentiful in the fall but came too late to do much damage.

TABLE 1—Temperature and Rainfall, Holly Springs Station, 1919 and 1920.

Temp. and Precip't'n	Y'r	Jan.	Feb.	Mch.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mean temperature.....	1919		46.3	53.5	61.6	67.0	77.0	81.1	81.6	77.2	70.5		
	1920	40.4	43.6	51.4	59.6	71.0	76.2	79.5	77.3	76.2	65.8	48.3	
Precipitation in inches.....	1919		3.33	8.50	4.26	7.10	3.88	1.08	1.65	1.51	9.06		
	1920	7.58	2.03	3.03	9.85	6.48	7.11	3.58	2.99	4.37	1.29	2.44	
Normal precipitation.....	1919		4.50	6.64	5.14	4.28	4.32	4.18	4.20	3.52	2.26		
	1920		4.50	6.64	5.14	4.28	4.32	4.18	4.20	3.52	2.26		

### VARIETY TEST ON VALLEY LAND, 1919.

The cotton in the valley land variety test was planted April 25, on brown loam soil. Skips in the stand were replanted by hand May 17. Excessive rains and coco grass injured the stand to some extent. The plots were 1-16 acre each; one row 5 feet wide and 230 feet long was repeated three times. The land was fertilized with a mixture of 100 pounds of cottonseed meal and 200 pounds of acid phosphate applied at the rate of 300 pounds per acre.

HOLLY SPRINGS BRANCH COTTON EXPERIMENTS

TABLE 2—VARIETY STUDIES ON VALLEY LAND—HOLLY SPRINGS STATION, 1919.

VARIETY	Plot yield first picking	Plot yield second picking	Plot yield third picking	Total yield seed cotton per acre	Lint per cent	Pounds of lint per acre	Length of lint	Value of lint	Pounds of seed per acre	Value of seed at \$75 a ton	Total money value per acre	Rank in money value
Simpkins.....	26.5	51	77.5	1240	32.8	406.72	15/16	168.79	833.28	31.24	200.03	18
Trice 270-41.....	48	49	97	1552	29.4	456.28	1-1/16	196.20	1075.72	40.35	236.55	9
Trice (Ark. Station).....	33	45.5	78.5	1256	29.4	370.52	7/8	151.91	885.48	33.23	185.14	22
Vandiver's Heavy Fruiter.....	14	68	82	1312	32.0	419.84	15/16	174.23	892.16	33.45	207.68	15
Cook-588.....	14	63.5	77.5	1240	34.9	432.76	16/16	179.60	807.24	30.26	209.86	14
Half and Half*.....	8	47	55	880	31.4	276.32	15/16	114.67	603.68	22.65	137.32	24
Wannamaker-Cleveland.....	8.5	74	82.5	1480	34.7	513.56	7/8	210.56	966.44	36.26	246.82	7
Cleveland Big Boll.....	14	80	94	1504	32.8	493.31	15/16	204.72	1010.69	37.91	242.63	8
Mexican Big Boll.....	21.5	60	81.5	1304	31.1	405.54	1	170.33	898.46	33.71	204.04	16
Sunbeam.....	6.5	48	54.5	872	31.0	270.32	1	113.53	601.68	22.57	136.10	25
Triumph.....	23.5	69.5	92.5	1480	37.1	549.08	1-1/16	236.10	930.92	34.91	271.01	3
Miller.....	8	62	70	1120	31.0	347.20	1-1/16	156.24	772.80	28.99	185.23	21
Lone Star-15.....	17.5	66	83.5	1336	33.5	447.56	1	187.98	888.44	33.30	221.28	13
Lone Star-132-48.....	20	58	78	1248	29.5	368.16	1 1/16	165.67	879.84	33.00	198.67	19
Magnolia.....	25.5	44	69.5	1112	26.3	292.45	1 1/8	146.22	819.55	30.75	176.97	23
Polk.....	23.5	59	82.5	1320	27.8	366.96	1 3/16	220.18	953.04	35.74	255.92	6
Express-432.....	20.5	56	76.5	1224	31.9	390.45	1 1/8	195.22	833.55	31.27	226.49	12
Express-122-433.....	27	63	90	1440	27.1	390.24	1 3/16	234.14	1049.76	39.37	273.51	2
Express-350.....	26.5	50.5	77	1232	26.5	326.48	1 1/8	163.24	905.52	33.97	197.21	20
Foster-11.....	19.5	63.5	83	1328	28.7	381.14	1 3/16	228.68	946.86	35.51	264.19	4
Columbia.....	15	60.5	75.5	1208	27.8	335.82	1 3/16	201.49	872.18	32.70	234.19	10
Webber-49.....	19	65	84	1344	28.1	377.66	1 3/16	226.60	966.34	36.22	262.82	5
Sunflower.....	14.5	67	81.2	1304	26.0	339.04	1 5/16	281.40	964.96	36.19	317.59	1
Allen.....	10	46	56	896	25.6	229.37	1 1/4	178.91	666.63	25.01	203.92	17
Meade.....	7	48	55	880	25.9	227.92	1 3/8	205.13	652.08	24.45	229.58	11

\*The seed planted were probably not Half and Half seed, although bought for that.

TABLE 3—VARIETY COTTON STUDIES ON BROWN LOAM VALLEY LAND, 1920.

Date of Planting—April 23, 1920.

Plots—One row each, repeated four times. Rows—3½x325 feet.

VARIETY	Dates of Picking.		Plot Yield Total.	Total Yield Per Acre.	Lint per cent.	Pounds of Lint Per Acre.	Length of Lint.	Value of Lint Per Pound.	Value of Lint.	Pounds of Seed Per Acre.	Value of Seed at \$25 per Ton.	Total Money Value per Acre.	Rank in Money Value.	
	Sept. 28	Oct. 21												
	Dec. 1													
1Simpkins Ideal.....	98	97	9	204.0	1953.1	134.2	668.0	1	106.88	1285.1	15.06	121.94	10	
2Huffman.....	93	92	12.	197.0	1886.1	132.17	606.8	1-1	103.16	1279.3	15.99	119.15	12	
3Cleveland-Wannamaker..	71.5	100	13	184.5	1766.4	435.0	632.4	1-1	107.51	1134.0	14.18	121.69	11	
4Coker's Ped. Cleveland...	77	110	11.5	198.5	1900.4	435.6	676.5	1-1	115.01	1223.9	13.29	128.30	8	
5Cleveland 37W-54.....	94	104	11	209.0	2000.9	34.5	690.3	1-1	117.35	1310.6	16.38	133.73	4	
6Cleveland Big Boll.....	60.5	106	15.	181.5	1737.7	33.3	578.7	1-1	98.38	1159.0	14.48	112.86	13	
7Smith's Cleveland.....	110.5	95	8.	5214.0	2048.8	32.7	670.0	1-1	113.90	1378.8	17.24	131.14	6	
8Express 122-433.....	114.5	66	7	187.5	1795.1	128.05	503.5	1-3	115.81	1291.6	16.14	131.94	5	
9Cook's 1010.....	95	90	10.5	195.5	1871.7	678.8	36.8	1-1	115.40	1192.9	14.91	130.31	7	
10Mexican Big Boll.....	88	87	14.5	189.5	1814.3	31.3	567.9	1-1	96.54	1246.4	15.58	112.12	14	
11Miller.....	67.5	101	27	195.5	1871.7	31.5	589.6	1-1	112.02	1292.1	16.14	128.17	9	
12Triumph.....	43	70	19	132.0	1263.8	35.4	447.4	1-1	85.01	816.4	10.20	95.21	17	
13Acala No. 5.....	78	71	14.5	163.5	1565.4	35.6	557.3	1-3	128.18	1008.1	12.60	140.68	3	
14Cook's 588.....	87	73	11	171.0	1637.2	37.2	609.0	1	97.44	1028.2	12.85	110.29	15	
15Vandiver's Heavy Fruiter	57	103	16	176.0	1685.0	32.3	544.3	1-1	92.53	1140.7	14.25	106.78	16	
16Webber 49.....	59	76	10	145.0	1388.2	28.5	395.6	1-3	37½	148.35	992.6	12.41	160.76	2
17Hartsville No. 12.....	32	115	11.5	158.5	1517.5	28.7	435.5	1-3	37½	163.31	1082.0	13.52	176.83	1

Staple Quotations; November 29, 1920, New Orleans Market. Strict Middling, Good character.

Stapling by C. W. Willis, Pontotoc, Mississippi.



TABLE 4—HILL LAND VARIETY TEST, 1919.

VARIETY.	Pounds of seed cotton per plot.	Pounds of seed cotton per acre.	Total money value.
Trice 270-41.....	50.0	1000	\$ 152.89
Wannamaker-Cleveland.....	45.5	910	151.73
Cleveland Big Boll.....	44.0	880	141.96
Express.....	49.0	980	196.62
Miller.....	50.0	1000	165.37

Soil—Brown loam table land.

Fertilizer—Mixture of 100 pounds of cottonseed meal and 300 pounds of acid phosphate.

Plots—Five varieties; 1-20 acre to each variety; one row each, repeated six times; planted April 25, 1919; replanted May 19, 1919.

#### COTTON VARIETIES.

The variety grown in any section is of far more importance than is generally understood. In the past fifteen years in our variety test, there has been more than an average of thirty-five dollars difference per acre each year, in money value, in varieties. In many instances seed are sold under a false name, local names frequently being used. Out of nineteen varieties used in the test this year, two were not true to name and their results discarded. When a good variety is secured by any grower, every effort should be made to keep the seed pure and of best quality.

We recommend the following varieties for this section:

##### For hill land—

Cleveland 37W-54  
Wannamaker-Cleveland  
Cleveland Big Boll  
Miller  
Triumph  
Cook

##### For valley land—

Wannamaker-Cleveland  
Trice-270-41  
Express-122-433  
Webber-49  
Sunflower

In the 1920 test, Wannamaker-Cleveland, Cleveland Big Boll, Triumph, and Miller were below their usual standing; we recommend them on their past records. Hartsville No. 12 and Acala No. 5 have been in the test only one year. Trice 270-41 is somewhat susceptible to wilt, but on fertile soils where there is no wilt, it produces heavy yields and a fair staple (one and one-eighth).

Before the War, when there was only a few cents difference per pound between short and long staple cotton, the short staple varieties at this Station gave the greater money value. During the War and at present, when a much wider difference in price per pound exists, the long staple varieties give the higher money value. No variety of cotton that pulls less than one inch staple should be grown; a sixteenth inch longer would be better. In many sections where only varieties with very short staples are grown, buyers pay two to three cents less per pound for all the cotton grown. Some of the best buyers do not establish offices in such sections.

TABLE 5—FERTILIZER TEST WITH COTTON, 1920.

Soil—Brown Loam Valley land, used for pasture fourteen (14) years prior to this work and on which we feel safe in saying no commercial fertilizer was ever used. The grazing crops were principally bermuda grass and lespedeza.

Plots—Four rows each, 3½ feet wide and 72 feet long, making 1-43.21 acre each. Record was only taken from the two inside rows. Most of the planting was in duplicate, as will be seen in table below.

Planted—May 10, 1920, in Trice 270-41 Cotton, germination taking place in five days.

FERTILIZER USED.	Yield of seed cotton per acre Series 1	Increase over check per acre	Yield of seed cotton per acre Series 2	Increase over check per acre	Average increase over checks
200 lbs. Acid Phosphate.....	2290.4	453.8	2506.5	345.7	399.8
Check.....	1836.6		2160.8		
400 lbs. Tenn. Phos Rock.....	1913.5	76.9	2376.8	216.0	146.5
400 lbs. Fla. Soft Rock.....	2204.0	129.7	2333.6	302.5	216.1
Check.....	2074.3		2031.1		
200 lbs. Duplex Phosphate.....	2290.4	216.1	2117.5	86.4	151.2
100 lbs. Kainit.....	2376.8	86.4			86.4
Check.....	2290.4		2074.3		
250 lbs. Cotton Seed Meal.....	2592.9	302.5	2549.7	475.4	389.0
100 lbs. Nitrate Soda.....	2536.1	764.3	2506.5	432.2	598.2
Check.....	1771.8		2074.3		
200 lbs. Tankage.....	2117.5	345.7			345.7
50 lbs. Cyanamid.....	2074.3	216.1	2722.5	388.9	302.0
Check.....	1858.2		2333.6		
75 lbs. Sulphate Ammonia.....	2009.5	151.3	2592.9	259.3	205.3
50 lbs. Nitrate Ammonia.....	2420.0	475.3	2355.2	280.9	378.1
Check.....	1944.7		2074.3		
200 lbs. Dried Blood.....	2333.6	388.9			388.9
25 lbs. Nitrate Ammonia.....					
37 1-2 lbs. Sulphate Ammonia.....	2592.9	388.9	2247.2	172.9	280.9
Check.....	2204.0		2074.3		
50 lbs Nitrate Soda.....			2031.1		
125 lbs. Cotton Seed Meal.....	2722.5	518.5	2247.2	216.1	367.3
50 lbs. Nitrate Soda.....					
100 lbs. Tankage.....	2636.1	216.1			
Check.....	2420.0		2031.1		
Soak Seed in Ni. Soda Solution					
50 lbs. After first working.....					
50 lbs. On July 1st.....	2592.9	172.9	2160.8	129.7	151.3
250 lbs. Cotton Seed Meal.....					
200 lbs. Acid Phosphate.....	2547.7	636.2	2592.9	821.1	728.6
Check.....	1901.5		1771.8		
100 lbs. Nitrate Soda.....					
200 lbs. Acid Phosphate.....	2333.6	432.1	2420.0	648.2	540.1
200 lbs. Tankage.....					
200 lbs. Acid Phosphate.....	2722.5	713.0	2247.2	519.6	616.3
Check.....	2009.5		1728.6		
50 lbs. Nitrate Soda.....					
37½ lbs. Sulphate Ammonia.....	2333.6	324.1			324.1
75 lbs. Cyanamid.....					
200 lbs. Acid Phosphate.....	2160.8	151.3	2506.5	605.0	383.1
Check.....	2009.5		1901.5		
75 lbs. Sulphate Ammonia.....					
200 lbs. Acid Phosphate.....	2528.1	518.6	2290.4	388.9	453.7
200 lbs. Dried Blood.....					
200 lbs. Acid Phosphate.....	2679.3	648.2			648.2
Check.....	2031.1		1728.6		
100 lbs. Nitrate Soda.....					
400 lbs. Tenn. Phos. Rock.....	2592.9	561.8	1858.2	129.6	345.7
100 lbs. Nitrate Soda.....					
400 lbs. Fla. Soft Rock.....	2506.5	216.1	1944.7	216.1	216.1
Check.....	2290.4		1728.6		
100 lbs. Nitrate Soda.....					
200 lbs. Duplex Phosphate.....	2765.8	475.4	1901.5	129.7	302.5
Check.....	2074.3		1771.8		
100 lbs. Nitrate Soda.....					
200 lbs. Acid Phosphate.....					
50 lbs. Kainit.....	2852.2	777.9	2160.8	432.2	605.0
Check.....			1728.6		



**Remarks**—The growing season was very wet until the middle of September; after this, there was but little rain. Bermuda grass and excessively wet soils affected results. The first boll weevil appeared about August 19, which was too late to do much damage.

**Conclusions**—The indications are that brown loam soils, even after long pasture periods, respond to the use of both nitrogen and phosphorous under favorable weather conditions. Under ordinary weather conditions, acid phosphate at the rate of 200 pounds per acre the first year after pasture, gives good results.

### COTTON CULTURE.

**Fertilizers**—In all North Mississippi, except the Prairie and Mississippi Delta, the use of from 200 to 400 pounds of a high grade fertilizer per acre will be found profitable. Fertilizers that will analyze from 10 to 12 per cent of phosphorous and 3 to 4 per cent of nitrogen should be used. Where a large quantity of a leguminous crop is turned under, 200 pounds of acid phosphate may be sufficient. A mixture of 200 pounds of cottonseed meal and 200 pounds of acid phosphate, or a mixture of 100 pounds of nitrate of soda and 200 pounds of acid phosphate per acre, or the equivalent in other forms of readily available nitrogen, is the most economical quantity of fertilizer we have found for soils of ordinary fertility.

Apply all the mixed fertilizers under the seed before planting. When nitrate of soda is to be used, it may be applied with the acid phosphate at planting time or after the first working of the crop. If the season is wet or the field is infested with coco grass, the latter method is preferable. If cotton seed are soaked for a few minutes in a saturated solution of nitrate of soda and water, and the seed dried before planting, good results may be obtained.

**Preparation and Cultivation**—Contrary to the teachings of agriculture, we have found fall plowing on rolling hill land not advisable in this section unless a cover crop is planted or a heavy crop of vegetable matter is turned under and the soil left rough. On slightly rolling or valley land this will not apply, though a winter cover crop will not be less profitable on such soils. The damage from washing is, of course, much less when the land is properly surface drained with a broad shallow terrace, which has a little fall. Slightly elevated rows are desirable under ordinary conditions. These may be obtained by flat breaking the land, disking and harrowing, laying off three and one-half foot rows, and applying fertilizer at the same time with a two-row corn planter and a fertilizer distributor. The rows may be covered sufficiently by running a middle breaker between them, and the desired elevation may be had by the use of a section harrow. If possible, this should be done about two weeks before planting time so that the rains will settle the soil and a firm seed bed will be secured. However, a firm seed bed is of less importance in early spring as rains are frequent.

Cotton planting time for this section is around April 20, or a little later. The boll weevil being a factor, the early planting of early maturing varieties on well fertilized soil, narrow rows, close spacing (ten inches), and frequent shallow cultivations are advised. Frequent shallow cultivations should continue until early September, when winter cover crops may be planted. Vetch, crimson clover, rye, and wheat are good winter cover crops.

TABLE 6—SPACING TEST, 1919

Row	Variety of Cotton Used.	Width of Row	Distance in Drill	Picked Sept. 16	Picked Nov. 20	Total per Plot	Total per Acre	Average per Acre
1	BLANK Trice 270-41.....							
2	Trice 270-41....							
3	Trice 270-41.....	3 ft.	9 in.	23	13.5	36.5	1245	
4	Wannamaker-Cleveland.....							
5	Wannamaker-Cleveland.....	3 ft.	9 in.	16	27	43		
6	Cleveland Big Boll.....							
7	Cleveland Big Boll.....	3 ft.	9 in.	21	25	46	1608	1452 lbs.
8	BLANK Trice 270-41.....							
9	Trice 270-41.....							
10	Trice 270-41.....	3.5 ft.	12 in.	18	40	58	1740	
11	Wannamaker-Cleveland.....							
12	Wannamaker-Cleveland.....	3.5 ft.	12 in.	14	32	46	1380	
13	Cleveland Big Boll.....							
14	Cleveland Big Boll.....	3.5 ft.	12 in.	22	29	51	1530	1550 lbs.
15	BLANK Trice 270-41.....							
16	Trice 270-41.....							
17	Trice 270-41.....	4 ft.	9 in.	26	22.5	48.5	1272	
18	Wannamaker-Cleveland.....							
19	Wannamaker-Cleveland.....	4 ft.	9 in.	15.5	35	50.5	1325	
20	Cleveland Big Boll.....							
21	Cleveland Big Boll.....	4 ft.	9 in.	21	30	51	1338	1312 lbs.
22	Trice 270-41.....							
23	Trice 270-41.....	4 ft.	16 in.	22	18	40	1050	
24	Wannamaker-Cleveland.....							
25	Wannamaker-Cleveland.....	4 ft.	16 in.	11.5	37	48.5	1272	
26	Cleveland Big Boll.....							
27	Cleveland Big Boll.....	4 ft.	16 in.	17.5	26.5	44	1155	1159 lbs.
28	BLANK Trice 270-41.....							
29	Trice 270-41.....							
30	Trice 270-41.....	3 ft.	16 in.	17.5	15.5	33	1152	
31	Wannamaker-Cleveland.....							
32	Wannamaker-Cleveland.....	3 ft.	16 in.	8	21.5	29.5	1032	
33	Cleveland Big Boll.....							
34	Cleveland Big Boll.....	3 ft.	16 in.	10	20	30	1050	1078 lbs.

**Soil**—Table land of medium and somewhat uneven fertility.

**Plots**—Six rows each with three varieties of cotton each plot, two rows each.

**Rows**—210 feet long.

**Fertilizer**—A mixture of 200 lbs. cotton seed meal and 200 lbs. acid phosphate per acre.

**Date of Planting**—April 25, 1919. Replanted: May 19, 1919.

**Remarks**—The last plot in the table composed of rows 28 to 34 inclusive is considerably off in fertility, but no allowance has been made in the above table.

TABLE 7—COTTON SPACING, 1920.

VARIETY.	Space in drill.	Yield in lbs. per plot.	Yield in lbs. per acre.
Cleveland-Wannamaker.....	6 in.	458	1207.64
Cleveland-Wannamaker.....	12 in.	473	1249.67
Cleveland-Wannamaker.....	18 in.	486	1284.01
Cleveland-Wannamaker.....	24 in.	431	1138.70

**Soil**—Slightly rolling upland.

**Plots**—Four rows, each 295 feet long, repeated four times.

**Planted**—May 11, 1920.

**Fertilizer**—A half and half mixture of cottonseed meal and acid phosphate was applied at the time of planting at the rate of about 250 pounds per acre.

**Remarks**—The boll weevil appeared about September 12, but was too late to do any damage.

**Conclusions**—In the past, results have been much more marked in favor of three and one-half foot rows and twelve inches in the drill. The above results indicate eighteen inches in the drill. On thin land where one horse tools are used, a three-foot row with plants a hoe's width apart will usually make more cotton than the wider rows and broader spacing.

### COTTON DISEASES.

**Cotton Wilt**—This disease seems to be confined to sandy or sandy loam soils and is more serious during wet seasons. No fungicide or fertilizer has been found that will prevent this disease as it is a fungus growth that develops within the plant and remains in the soil for years. The best known method for controlling this disease is to plant wilt resistant varieties. Seed from plants not affected by wilt when grown on infected soils, if selected each year, may develop better varieties for growing on infected soils.

**Cotton Rust**—Rust in cotton may be checked very materially by the use of one hundred pounds of kainit per acre.

### TWO-YEAR ROTATION.

A satisfactory two-year rotation can be maintained by planting fifteen pounds of vetch seed per acre in the middles before the last working of cotton. Allow the vetch to seed the following spring, turn it under, and plant the land to corn. The next year plant to cotton. There will be enough vetch seed in the soil to insure a good stand in the cotton. Allow the vetch to mature seed, save vetch for hay, turn land and plant to cotton as before. This will give three crops in two years and greatly increase soil fertility.