12-1-1923

Report from Holly Springs Branch Experiment Station for 1923

C. T. Ames

Bulletin No. 220 December 1923

REPORT

from

Holly Springs Branch Experiment Station for 1923

By C. T. AMES

Mississippi Agricultural Experiment Station
A. & M. College, Mississippi
J. R. Ricks, Director

EXPERIMENT STATION STAFF

D. C. Hull, M. Sc., President of College.
J. R. Ricks, M. Sc., Director and Chief in Agronomy.
M. H. Moore, Secretary and Financial Agent.
E. B. Ferris. M. Sc., Asst. Director. South Miss. Branch Station.
C. T. Ames, B. Sc.. Asst. Director, Holly Springs Branch Station.
C. B. Anders, B. Sc., Asst. Director, Raymond Branch Station.
W. E. Ayres, M. Sc., Asst. Director and Plant Breeder, Delta Branch Station
*S. W. Greene, in charge of Coastal Plains Branch Station.
W. F. Hand, M. Sc., Ph. D., Chemist.
J. S. Moore, M. Sc., Chief in Dairy Husbandry.
R. W. Harned, B. S. A., Chief in Entomology.
C. F. Briscoe, A. M., Ph. D., Bacteriologist.
Geo. S. Templeton, B. Sc., Animal Husbandman.
J. M. Beal, M. Sc., Botanist.
E. P. Clayton, Poultry Husbandman.
W. C. Morse, M. Sc., Geologist.
A. B. McKay. B. Sc., Chief in Horticulture.
D. C. Neal, B. Sc., M. A., Plant Pathologist.
J. N. Lipscomb, M. Sc., Farm Economist.
J. F. O'Kelly, M. Sc., Plant Breeder.
J. C. C. Price, B. Sc., Horticulturist.
Earle Brintnall, B. Sc., Dairyman
C. J. Goodell, B. Sc., Associate in Farm Management.
H. W. Allen, B. Sc., Entomologist.
K. U. Jones, B. Sc., V. M. D., Veterinarian.
R. N. Lobdell, M. Sc., Zoologist.
W. S. Anderson, B. Sc., Horticulturist and Assistant, South Miss. Branch Station.
H. F. Wallace, B. Sc., Assistant at Holly Springs Branch Station.
H. A. York, B. Sc., Assistant at Delta Branch Station.
H. H. Harned, M. S., Associate in Bacteriology.
Rowland Cowart, Associate Agronomist.
Miss Kittie Sue Johnson, A. B., Secretary-Stenographer.
Miss Fannie Page, Stenographer.
Miss Mary Alice Lanier, Addressograph Operator.
D. W. McIlwain, Superintendent of Farm.
D. Maxwell, Foreman and Herdsman.
B. V. Evans, Farm Foreman, South Miss. Branch Station.
J. C. Ryan, Farm Foreman, Holly Springs Branch Station.
J. C. Peyton, Farm Foreman, Raymond Branch Station.
K. C. Livingston, Farm Foreman, Delta Branch Station.
F. O. Cork, B. Sc., Superintendent, Farm Management Vocational Project.
H. B. Brown, Ph. D., Collaborator.
E. C. Ewing, M. Mc., Collaborator.

*In co-operation, Bureau of Animal Industry, U. S. Department of Agriculture.

Holly Springs Branch Experiment Station—1923

This bulletin contains a greater part of this year's work. There are some projects incomplete which cannot be reported on at this time. In our farming experience we have never seen weather conditions as they were this year. We have seen prolonged rainy seasons at various times of the year, but we have never seen rain begin in April and continue until September with only a few days' intermission between rains. According to the United States Government Report, 1923 marks the shortest cotton crop in Mississippi for the past fifty years.

Weather conditions at Holly Springs, Miss., 1923:

Months—	Rainy Days	Cloudy and Rainy Days	Total Rainfall Each Month	Total Rainfall for Six Months
April	13	14	9.09	---
May	16	17	11.28	---
June	13	14	6.75	---
July	12	16	4.60	---
August	13	18	3.84	---
First 10 days in Sept.	7	8	2.36	---
Total	---	---	---	37.82

Soil improvement has had the first place with us, recognizing that a fertile soil is the basis of all successful agriculture. We see to it that every acre of our cultivated lands grows a legume of some kind, either summer or winter and in some instances both.

Special attention has been given to cotton, corn, and sweet potato variety studies and spacing tests. Boll weevil poisoning has had every attention, with the assistance of the State Plant Board and every employee of this Station. Cultural methods with cotton and corn, and fertilizer studies with cotton have had a prominent place in the year's work. Co-operative fertilizer tests under the supervision of County Agents and good farmers have given good results.

Variety tests with alfalfa, vetch, grasses, and clovers, forage crops, permanent pastures, crop rotations and the use of lime have had attention.

Erosion—Over the State more attention to soil washing is being paid now than in the past. Soil washing should have first attention even before the growing of legumes or the use of farm manures. The importance of this work has never been fully realized and until the surface water is properly controlled on rolling hill lands there is but little hope of increasing soil fertility. How can land increase in fertility that washes with every heavy rain? County Agents are giving more attention to terracing. The Federal

Farm Loan Bank is requiring all cultivated rolling lands to be terraced before government loans will be made on such lands. The broad shallow terrace with a slight fall has given good results. Terrace the best acre on the farm first, and then the next best acre, and so on until the farm is terraced. Where terracing is done in time the cost is but little. Labor is the principal cost and even where outside labor is employed, the cost of constructing terraces on one acre of land will be the cost of one laborer per day, plus the cost of the teams. These teams are doing but little at the season when terracing should be done.

COTTON

For the next few years at least cotton will of necessity be one of Mississippi's chief money crops; and under existing conditions, should be. The prospects for prices are good and if every farm will grow at least the foods and feed required for the farm the price for cotton will remain good for some time to come. Two outstanding things confront the growers of cotton another year. These are fertilizers, and the use of poison to control the boll weevil. The necessity of using both fertilizer and poison and the proper use of each will to a great extent measure the success or failure in profitably growing cotton in the future. While variety and cultural methods will have their effect, the most important factors will be fertilizers and poison.

Preparation and Cultivation—On account of soil washing during the heavy rains of the winter on hill lands, it is advisable to leave as much vegetable matter on the land as possible for protection. Sod lands should be turned in the fall or winter and left rough. Valley lands may be prepared for cotton during fall or winter if the water is properly controlled on the land. Where such is not the case but little will be gained. On rolling land unprotected by terraces and where every row has more fall than it should have, soil washing will be increased by fall plowing. Only two ways shall be given to prepare land and fertilize same for cotton. Where two furrows are thrown together or listed it is a common practice to apply the fertilizer on this list by hand, or in the list with a fertilizer distributor. After this the middles are thrown out and the land after harrowing is ready for planting. The other method is to prepare the land in rows, open the rows and distribute the fertilizer, covering by the use of a harrow. If possible apply the fertilizer a week or ten days before planting. We have very often found it necessary to apply the fertilizer just ahead of the planter.

Seed Bed—A well prepared firm seed bed is ideal for seed of any kind. If the land can be prepared and fertilized far enough ahead to be settled by rain, then harrowed and planted, the condition would be ideal. About cotton planting time rains are usually frequent and but little attention is given the subject. In case of dry weather use the roller after planting.

Width of Row—For fertile valley lands make three and one-half foot rows. For thin upland, three foot rows are sufficient.

Time of Planting—Cotton planting time in this latitude is after April the twenty-fifth and if possible should be completed before May 10th. It appears that the time changes going south from this place at the rate of

one day earlier for each additional twenty miles. In other words, the time for planting along the Southern Railroad from Greenville to Columbus, one hundred miles south of here, is about April 20th, and so on. When cotton is planted earlier than the date given, one of two things usually occurs: the land has to be planted over or a poor stand is secured which usually winds up with a much later planting. Early planting is desired; also a perfect stand is desired. By medium early planting a good stand can be secured. The easiest way for Mississippi to increase her cotton crop from twenty-five to fifty per cent on many farms in the State without cost is to get a stand of cotton. Four or five years ago the above would have applied to most of the cotton grown in the State.

A Stand of Cotton—On hill land a stand of cotton is from three to five stalks in bunches about twelve inches apart. On valley or fertile hill land, rows should be three and one-half feet wide and two to four stalks in bunches to every foot. Cotton seed should be planted very shallow and on medium elevated rows. Use not less than one and one-half bushels of seed per acre. It is the common custom to run the planters twice down the same row. The first trip will plant the seed deep and the second trip will plant shallow. This method will increase chances for a stand. If the seed have been delinted and the inferior seed removed, a good stand can be secured with less seed.

Fertilizers—See recommendations under fertilizer experiments.

Varieties—See recommendations under variety studies.

Cultivation—Cultivation should begin as soon as the plants are established sufficient not to be injured in cultivation. Thin as soon as possible and give frequent shallow cultivations.

Early Poisoning—Calcium arsenate applied in the bud of the cotton just as the squares begin to show will kill the weevil. Either the sweet poison or the dust form will do the work. A second application ten days later will kill more weevils. These two applications will probably control the weevil on thin hill and assisted by dry weather. After there is a ten per cent infestation use the calcium arsenate dust as recommended by Mr. Coad. Make frequent infestation counts.

A Progress Report of our boll weevil work for this year can be had from the Main Station, at the A. & M. College, Mississippi.

VARIETY TEST WITH COTTON—1923

Two tests were made, one on hill and one on valley land.

The seasons were unfavorable, causing late planting and some replanting. The dates of planting were May 7 and May 8, 1923. The valley land test was on first-class valley land where vetch has been grown for years. This land is infested with coco grass and between the rains and coco, only a fair stand was secured. With a few exceptions, the stand of one variety was about as good as the stand of another.

The hill land test was on Brown Loam table land that would make about three-fourths of a bale of cotton a normal season without boll weevil.

Tables No. 1 and No. 2 give the results of these variety tests.

Table No. 1.—VALLEY VARIETY TEST, 1923

No.	VARIETY TEST	Total Yield Seed Cotton 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 $50 Per Ton	Total Money Value Per Acre	Rank in Money Value
1.	Miss. Station Trice	1360.0	30.0	408.0	1-1/16	34	$138.72	952.0	$23.80	$162.52	3
2.	Wann-Cleveland	882.5	36.8	324.8	7/8	32¾	106.37	557.7	13.94	120.31	20
3.	Piedmont-Cleveland	1075.0	33.0	354.8	15/16	33½	118.84	720.2	17.96	136.80	10
4.	Cleveland-54	1187.5	35.4	420.4	15/16	33½	140.83	767.1	19.18	160.01	5
5.	Half & Half	962.5	37.9	364.8	3/4	32¼	117.65	597.7	14.94	132.59	11
6.	Cooks-588	952.5	36.5	347.7	7/8	33¼	115.61	604.8	15.12	130.73	12
7.	Triumph (Willis)	1262.5	32.9	415.4	15/16	33½	139.16	847.1	21.18	160.34	4
8.	Miller	972.5	32.6	317.0	1-1/16	34	107.78	655.5	16.39	124.17	16
9.	Acala No. 5	890.0	36.4	324.0	1-1/16	34	110.16	566.0	14.15	124.31	15
10.	Lone Star-65	1375.0	33.5	460.6	1-1/16	34	156.60	914.4	22.86	179.46	1
11.	Salsbury	962.5	32.5	312.8	1-1/16	34	106.35	649.7	16.24	122.59	18
12.	Webber 49-4	820.0	30.4	249.3	1-1/4	37	92.24	570.7	14.27	106.51	24
13.	Webber Delta Type	962.5	29.8	286.8	1-3/16	35½	101.81	675.7	16.89	118.70	21
14.	Sunpress	1032.5	27.4	282.9	1-1/4	37	104.67	749.6	18.74	123.41	17
15.	Delfos 631	1115.0	32.3	360.1	1-3/16	35½	127.84	754.9	18.87	146.71	7
16.	Delfos 6102	1297.5	31.5	408.7	1-3/16	35	143.05	888.8	22.22	165.27	2
17.	Express-Walcott	947.5	29.4	278.6	1-3/16	35	97.51	668.9	16.72	114.23	22
18.	Express 782	995.0	32.2	320.4	1-3/16	35	112.14	674.6	16.87	129.01	13
19.	Express-Lightning	1160.0	30.4	352.6	1-3/16	35	123.41	807.4	20.19	143.60	9
20.	Express 630	1015.0	30.0	304.5	1-3/16	35	106.58	710.5	17.76	124.34	14
21.	D. & P. L. No. 3	795.0	29.9	237.7	1-1/4	36½	86.76	557.3	13.93	100.69	25
22.	Express 350	952.5	27.4	261.0	1-3/16	35	91.35	691.5	17.29	108.64	23
23.	Harrison's Pet	992.5	31.4	311.6	7/8	33¼	103.61	680.9	17.02	120.63	19
24.	Mahon's Imp. ½ & ½	992.5	41.9	415.9	7/8	33¼	138.29	576.6	14.42	152.71	6
25.	Lone Star 79	1175.0	30.2	354.9	1-3/16	35	124.22	820.1	20.50	144.72	8

Table No. 2.—HILL VARIETY TEST, 1923

No.	VARIETY USED	Total Yield Seed Cotton 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 $50 Per Ton	Total Money Value Per Acre	Rank in Money Value
1.	Miss. Station Trice	755.7	33.9	256.2	1- F	33¾	$86.47	499.5	$12.49	$ 98.96	3
2.	Wann-Cleveland	438.5	38.9	170.6	7/8	32¾	55.87	267.9	6.70	62.57	22
3.	Piedmont	622.0	36.0	223.9	7/8	33¼	74.45	398.1	9.95	84.40	13
4.	Cleveland 54	503.8	37.5	188.9	7/8	33¼	62.81	314.9	7.87	70.68	17
5.	Half & Half	578.5	41.6	240.7	3/4	32¼	77.63	337.8	8.45	86.08	12
6.	Cook's 588	631.3	40.0	252.5	7/8	32¾	82.69	378.8	9.47	92.16	8
7.	Triumph (Willis)	765.1	35.3	270.1	7/8	33¼	89.81	495.0	12.38	102.19	2
8.	Miller	547.4	37.0	202.5	1- F	33¾	68.34	344.9	8.62	76.96	15
9.	Acala No. 5	671.8	38.9	261.3	1- F	33¾	88.19	410.5	10.26	98.45	4
10.	Lone Star 65	668.7	34.3	299.4	1-1/16	34	78.00	439.3	10.98	88.98	11
11.	Salsbury	482.1	35.6	171.6	1-1/16	34	58.34	310.5	7.76	66.10	19
12.	Webber 49-4	317.2	32.5	103.1	1-3/16	35	36.09	214.1	5.35	41.44	25
13.	Webber-Delta Type	438.5	35.5	155.7	1-3/16	35	54.50	282.8	7.07	61.57	23
14.	Sunpress	572.2	29.9	171.1	1 3/16F	35½	60.74	401.1	10.03	70.77	16
15.	Delfos 631	690.4	35.0	241.6	1-3/16	35	84.56	448.8	11.22	95.78	6
16.	Delfos 6102	659.3	34.9	230.1	1-1/8	34½	79.38	429.2	10.73	90.11	9
17.	Express-Walcott	674.9	33.5	226.1	1-1/8F	34½	78.01	448.8	11.22	89.23	10
18.	Express 782	572.2	35.2	201.4	1-1/8F	34½	69.48	370.8	9.27	78.75	14
19.	Express-Lightning	842.8	32.9	277.3	1-1/8F	34½	95.67	565.5	14.14	109.81	1
20.	Express 630	737.1	32.5	239.6	1-1/8F	34½	82.66	497.5	12.44	95.10	7
21.	D. & P. L. No. 3	522.5	32.7	170.9	1-3/16	35	59.82	351.6	8.79	68.61	18
22.	Express 350	506.9	31.2	158.2	1-1/8	34½	54.58	348.7	8.72	63.30	21
23.	Harrison's Pet	451.0	34.6	156.0	7/8S	32¾	51.09	295.0	7.38	58.47	24
24.	Mahon's Imp. ½ & ½	457.2	40.1	183.3	3/4F	32¼	59.11	273.9	6.85	65.96	20
25.	Lone Star 79	737.1	33.1	244.0	1-1/8	34½	84.18	493.1	12.33	96.51	5

Varieties—This is the second year since the war that staple cotton and short cotton has brought within a few cents of the same price. How long these conditions will exist we are unable to answer. The closer the prices of long and short staple are to each other, the more difficult it is to make selections especially for hill land varieties, as so much improvement has been made in the staple varieties. In these variety tests it will be seen that Lightning Express, pulling 1⅛ inches in staple, gave the highest money value. It is evident that the variety did better on hill land this year than on valley land. As a rule it is better to grow short staple varieties of cotton on thin upland than the staple varieties. Stark Willis' Triumph, ⅞ inches in staple came second, Mississippi Station Trice third, etc. Unquestionably the early big boll varieties should be added to this list, such as Piedmont Cleveland, Cleveland Big Boll and Cleveland 54.

In the valley land test, Lone Star-11-65 gave the highest money value. This is a very promising variety and when seed of this variety can be had in sufficient quantities. it will rank high as a bender cotton. Delfos-6102 and 631, Mississippi Station Trice, Stark Willis' Triumph, Cleveland 54 and Cleveland Big Boll all do well on the richer lands.

FERTILIZER TEST WITH COTTON—1923

Soil—Brown Loam Valley Land.

Variety of Cotton—Delfos 6102. A good stand was secured.

Date of Planting—April 27, 1923.

Size of Plats—1/43 of an acre each.

TABLE No. 3.

Lbs. per Acre	Fertilizer Used—	SERIES 1. Yield Seed Cotton per Acre	SERIES 1. Increase Over Checks per Acre	SERIES 2. Yield Seed Cotton per Acre	SERIES 2. Increase Over Checks per Acre	Av. Value of Seed Cotton per A. at 10c per Lb. for Staple Cotton
200	Acid Phosphate	.....	.....	1616.2	95.0	$161.62
	Check	.....	.....	1521.2	.....	152.12
400	Tenn. Phosphate Rock	.....	.....	1841.10	319.8	184.10
400	Florida Soft Rock	.....	.....	1780.5	60.5	178.05
	Check	.....	.....	1720.0	.....	172.00
100	Nitrate Soda	.....	.....	1650.8	319.8	165.08
	Check	.....	.....	1331.0	.....	133.10
100	Cyanamid	.....	.....	1547.1	86.4	154.71
	Check	.....	.....	1460.7	.....	146.07
75	Sulphate Ammonia	.....	.....	1581.7	121.0	158.17
50	Nitrate Ammonia	1659.5	172.9	1408.8	86.4	153.42
	Check	1486.6		1322.4	.....	140.45
200	Dried Blood	1771.8	285.2	.....	.....	177.18
25	Nitrate Ammonia and					
37½	Sulphate Ammonia	.....	.....	1365.6	43.2	136.56

TABLE No. 3—(Continued)

Lbs. per Acre	Fertilizer Used—	SERIES 1		SERIES 2.		Av. Value of Seed Cotton per A. at 10c per Lb. for Staple Cotton
		Yield Seed Cotton per Acre	Increase Over Checks per Acre	Yield Seed Cotton per Acre	Increase Over Checks per Acre	
	Check	1841.0	.....	1106.3	.....	147.37
50	Nitrate Soda and					
125	Cottonseed Meal	1884.2	43.2	1279.2	172.9	158.17
50	Nitrate Soda and					
100	Tankage	1478.0	17.3	.....	.....	147.80
	Check	1460.7	.....	864.3	.....	116.25
	Soak Seed in Ni. Soda Sol. and					
50	After first working and					
50	On July 1st	.....	.....	1287.8	423.5	128.78
250	Cottonseed Meal and					
200	Acid Phosphate	1624.9	146.9	.....	.....	162.49
	Check	1478.0	.....	1391.5	.....	143.48
100	Nitrate Soda and					
200	Acid Phosphate	1841.0	363.0	1953.3	561.8	189.72
	Check	.....	.....	1080.4	.....	108.04
200	Tankage and					
200	Acid Phosphate	1443.4	146.9	1235.9	155.5	133.97
	Check	1296.5	.....	1106.3	.....	120.14
50	Nitrate Sida and					
37½	Sulphate Ammonia	.....	.....	1244.6	138.3	124.46
75	Cyanamid and					
200	Acid Phosphate	.....	.....	1789.1	250.6	178.91
	Check	.....	.....	1538.5	.....	153.85
75	Sulphate Ammonia and					
200	Acid Phosphate	.....	.....	1668.1	129.6	166.81
200	Dried Blood and					
200	Acid Phosphate	1979.2	518.5	.....	.....	197.92
	Check	1460.7	.....	.....	.....	146.07
100	Nitrate Soda and					
400	Tenn. Phosphate Rock	1616.2	17.2	1305.1	293.9	146.07
100	Nitrate Soda and					
400	Florida Soft Rock	2057.0	458.0	1279.2	268.0	166.81
	Check	1599.0	.....	1011.2	.....	130.51
100	Nitrate Soda and					
200	Duplex Phosphate	1841.0	458.1	1642.2	337.1	174.16
	Check	1382.9	.....	1305.1	.....	134.40
100	Nitrate Soda and					
200	Acid Phosphate and					
50	Kainit	2100.2	717.3	1642.2	561.8	187.12
	Check	1382.9	.....	1080.4	.....	123.17

Remarks—The lower end of these plats was ruined by continued rains, thereby destroying the results in part of Series No. 1. A complete fertilizer consisting of 200 pounds of acid phosphate, 100 pounds of nitrate of soda, and 50 pounds of kainit gave the highest yields in both series. The

Table No. 5—CO-OPERATIVE FERTILIZER TESTS—1923

RESULTS ON ACRE BASIS

Plat No.	Fertilizer Used—(Pounds)	GRENADA		BOONEVILLE		OLIVE BRANCH		EUDORA	
		Av. Yield 2 Series	Val. Seed Cotton at 11c	Av. Yield 2 Series	Val. Seed Cotton at 11c	Av. Yield 2 Series	Val. Seed Cotton at 11c	Av. Yield 2 Series	Val. Seed Cotton at 11c
1.	100 Nit. So.	471	$51.81	350	$38.50	919	$101.09	390	$42.90
2.	200 Acid Phos.	325	35.75	517	56.87	859	94.49	326	35.86
3.	Check	318	34.98	251	27.61	802	88.22	217	23.87
4.	200 Acid Phos. 100 Nit. So. 100 Kainit	487	53.57	657	72.27	1071	117.81	480	52.80
5.	200 Acid Phos. 100 Nit. So.	512	56.32	656	72.16	882	97.02	480	52.80
6.	Check	314	34.54	254	27.94	822	90.42	188	20.68
7.	150 Acid Phos. 100 Nit. So. 75 Kainit	565	62.15	660	72.60	775	85.25	508	55.88
8.	150 Acid Phos. 100 Nit. So. 100 Kainit	621	68.31	750	82.50	875	96.25	526	57.86
9.	Check	368	40.48	299	32.89	775	85.25	263	28.93
10.	250 Acid Phos. 100 Nit. So.	650	71.50	657	72.27	763	83.93	517	56.87
11.	250 Acid Phos. 100 Nit. So. 100 Kainit	586	64.46	583	64.13	788	86.68	571	62.81
12.	Check	332	36.52	147	16.17	820	90.20	272	29.92
13.	300 Acid Phos. 150 Nit. So.	586	64.46	572	62.92	1045	114.95	598	65.78
14.	300 Acid Phos. 150 Nit. So. 100 Kainit	574	63.14	593	65.23	1085	119.35	635	69.85
15.	Check	293	32.23	167	18.37	728	80.08	272	29.92
16.	300 Acid Phos. 200 Nit. So.	642	70.62	537	59.07	919	101.09	680	74.80
17.	300 Acid Phos. 200 Nit. So. 100 Kainit	700	77.00	667	73.37	1008	110.88	680	74.80

Remarks—In the plats at Grenada it will be seen that plat No. 17 has given $43.77 profit over the check plat, plat No. 16, $37.39 and plat No. 10. $31.02.

In the plats at Boonville, plat No. 17 gave a profit of $55.00 over the check, and plat No. 8, $49.61. The fertilizer for the last plat is the most economical quantity, we believe, for that locality.

In the plats at Olive Branch, plat No. 14 gave a profit over the check plat of $39.27, No. 17 a profit of $30.80, and No. 4 a profit of $29.59. This set of plats had an application of cow manure the year before and this could account for the irregularity in the results as can be seen.

In the plats at Eudora, plats Nos. 16 and 17 gave a profit over the check of $44.88, No. 14 gave a profit of $39.93 and No. 7 a profit of $35.20.

It should be remembered that this is only one year's results and that these results should not be considered conclusive.

Conclusions—There is no marked difference as to the fertilizer requirements in these several sections. The outstanding fact is that both nitrogen and phosphorous are deficient and potash to some extent, and that a moderate amount of a complete fertilizer rich in nitrogen increases the yield of cotton from 200 to 400 per cent any year.

Taking into consideration these results and results for the past four years at this Station, we believe from 50 to 100 pounds of kainit or potash in other forms, per acre, added to our former recommendations is advisable. For average conditions 200 pounds acid phosphate, 100 pounds nitrate of soda and 100 pounds of kainit mixed, per acre or 400 pounds of a mixed fertilizer analyzing 8% phosphoric acid, 4% nitrogen and 3% potash (8-4-3). Where good farming is to be done, the addition of from 50 to 100 pounds of nitrate of soda added to the above as a side dressing will be found profitable. On lands to be planted in cotton after lespedeza or other leguminous crops that have been turned under or farm manures used, the amount of nitrogen may be reduced to about half, but at least the fertilizer recommended should be used.

COTTON SPACING TEST—1923

Soil—Brown Loam Table Land.

Size of Plats—1/15.56 of an acre, planted to Wannamaker Cleveland Cotton.

Date of Planting—May 8 and replanted skips May 28, 1923.

TABLE No. 6.

Series 1—Poisoned with calcium arsenate dust.

Plants Per Hill	Inches Between Hills	SERIES 1—Poisoned			SERIES 2—Unpoisoned		
		Pounds Seed Cotton		Acre Val. Seed Cotton at 10c per Lb.	Pounds Seed Cotton		Acre Val. Seed Cotton at 10c per Lb.
		Plat Yield	Acre Yield		Plat Yield	Acre Yield	
Unthinned	....	47.2	734.4	73.44	26.0	404.6	40.46
1	6	45.8	712.7	71.27	25.9	403.0	40.30
2	12	40.1	624.0	62.40	26.3	409.2	40.92
1	12	37.8	588.2	58.82	21.3	331.4	33.14
1	18	29.5	458.9	45.89	20.6	320.5	32.05
1	24	31.0	482.4	48.24	16.5	256.7	25.67

Remarks—A poor stand was secured and while replanted by hand these replants amounted to but little. The late planting, excessive rains and labor shortage about destroyed this test except as a poisoning test. Our valley land test was destroyed for the reasons given above. In this test the unthinned cotton has given the best yield; we do not think it is practical to grow cotton unthinned. On hill land, three to four stalks in a bunch every foot is not far from proper spacing; on valley land from two to three stalks every foot. This year many farmers have charged up the work of the boll weevil to close spacing, that is to say, they have made but little cotton and some of them say close spacing is the cause.

The land on which the 24-inch space cotton was grown was in velvet beans during 1920 and 1921. This cotton grew almost double the size stalk this year which will in all probability account for the yield given.

CORN

The yield of corn on the Station this year will average more than fifty bushels per acre. Practically all corn grown on the Station is after vetch or some winter legume. As a rule, where the land is thin, early planting of corn, say around the latter part of April, gives the best results. The seasons are usually more favorable about the time the corn begins to fruit, than is the case where later plantings are made. Thin land is a poor place to try to grow corn. If our corn and bean test gives anywhere near what could be expected an average year and we believe they do, by all means grow beans in all planting of corn.

Where such a method can be practiced, break the land broadcast, harrow and plant. If the soil is poorly drained, bed in seven-foot rows, harrow and plant two rows to a bed.

Fertilizers—Corn responds as readily to the use of fertilizers as does other crops. As corn blooms only once unfavorable weather at that season may cause the fertilizer to prove unprofitable. When possible, plant only fertile land to corn. Apply a mixture of 150 pounds acid phosphate and 100 pounds of nitrate of soda per acre in the row before planting. If the land has been fertilized freely with acid phosphate for several years prior

to corn planting, only nitrate of soda need be used. We would not think of growing corn without the use of fertilizer even though the water supply does frequently control the yield.

Planting and Cultivation—Corn should be planted very shallow in the spring. We prefer wasting seed corn in order to insure a good stand. On average land, one stalk of corn every thirty inches is about the right distance. As the land increases or decreases in fertility the distance should vary. The more fertile the land the closer the corn can be grown. The usual mistake is to grow corn too thick and cotton too thin. Four or five cultivations are usually sufficient, especially on late plantings. A Perry cultivator run two or three inches deep gives very satisfactory results. Any plow or cultivator that will leave a comparatively smooth surface and not plow deeper than three inches is all right for corn culture. Where deep cultivation is practiced from the beginning it has proven satisfactory. Run the cultivator about the same depth at each cultivation.

VARIETY CORN TEST—1923

Soil—Valley Land.

Plats—One row each planted in checks, repeated six times. Rows or checks 3½ feet apart, with two stalks to each hill.

Date of Planting—June 25, 1923.

Fertilizer Used—200 pounds acid phosphate and 100 pounds nitrate of soda.

TABLE No. 7.

No.	Variety Used—	Yield in Bu. Shelled Corn Per Acre	Yield in Lbs. Ear Corn Per Plat	Per Cent of Grain	Size of Plats On Acre Basis	Rank
1.	Williamson	66.62	323	75.0	1/15.40	13
2.	Biggs Seven Ear	66.97	348	75.0	14.37	12
3.	Whatley	69.57	355	72.2	15.20	10
4.	Mosby—Station	64.73	337	76.4	14.08	14
5.	Mosby—Delta	67.61	341	77.1	14.40	11
6.	Cocke's Prolific—Station	72.51	372	77.8	14.03	6
7.	Cocke's Prolific—Delta	72.81	361	74.3	15.20	4
8.	Davis Prolific	61.52	318	73.6	14.72	18
9.	Hastings	72.80	367	76.4	14.54	5
10.	Vardaman	69.73	361	77.1	14.03	9
11.	Marlboro	63.09	339	70.8	14.72	17
12.	Laguna	63.62	338	72.2	14.60	16
13.	Mexican June	71.19	338	77.8	15.16	8
14.	Rockdale	72.17	360	77.8	14.43	7
15.	Paymaster—Neal	79.51	392	77.8	14.60	1
16.	Paymaster—Harpeth	75.75	384	77.8	14.20	2
17.	Ellis	63.77	333	73.6	14.57	15
18.	Delta Prolific	73.27	373	77.8	14.14	3
19.	Yellow Dent—Ferguson	59.50	301	73.6	15.04	19
20.	Yellow Dent—Stewart	46.03	232	71.5	15.54	20

Remarks—A fair crop of crimson clover was turned under this spring on this field. This land was turned three times before planting, heavy rains delayed planting.

Neal's Paymaster led the list with 79.5 bushels per acre. This variety in the past has stood at the top in yield. We feel justified in recommending Neal's Paymaster, Harpeth's Paymaster, Delta Prolific and Cocke's Prolific.

CORN AND BEAN TEST—1923

Two sets of plats consisting of two series each were planted to corn and beans. One set was planted after oats and the other set after vetch. The dates of planting were as follows: June 15, 1923 and July 2, 1923, and the size of plats 1/11 acre and 1/7 acre each. The average results of the four series will be found in the following table.

TABLE No. 8.

Method of Planting—	Average Yield in Bu. per Acre of the Four Series
1. 6 Rows Corn	48.2
2. 6 Rows Corn and Otootan Beans	45.5
3. 6 Rows Corn and Velvet Beans	31.3
4. 6 Rows: 2 Rows Corn to 1 Row Otootan Soy Beans	42.5
5. 6 Rows: 2 Rows Corn to 1 Row Velvet Beans	40.2

Remarks—Velvet beans in every row of corn reduced the yield of corn 16.9 bushels per acre. This method of growing beans in corn is the least desirable. Where the Otootan soybeans were grown in every row, the yield was reduced but little. From this year's results this is the best way to grow corn. In previous years, results where seasons were dry, the yield of corn was reduced considerably when the corn and beans were grown in the same row. We wish to state here that Otootan soybean is the most desirable variety of soybean for this purpose on these soils.

In the plantings of two rows of corn to one of beans, the comparative results are a little below what they have been an average season. The same number of stalks of corn per acre was grown.

Conclusion—Plant beans in your corn to keep up soil fertility.

Silage—Sorghum alone is used for silage on this Station. The variety known as Japanese Seeded Ribbon cane is grown entirely by this Station. This sorghum produces at least one-third more tonnage per acre on thin or fertile land than corn and is about as valuable ton for ton as corn silage, the corn silage being slightly more valuable. This sorghum has other advantages. Dry seasons the sorghum will stand the drouth better and at harvest time the sorghum will not damage if harvesting is delayed. Corn blooms but once and if the season is unfavorable at that time the silage will be poor. Sorghum should not be harvested for silage until fully ripe; immature sorghum will give sour silage.

All of our sorghum is grown after vetch is harvested from the land. This keeps up soil fertility. On good land, twenty tons of sorghum can be grown per acre, the average being ten or twelve tons. The seed of the sorghum take the place of the grain on the corn. Fertilize as for corn. Where increased tonnage is desired, use larger quantities of fertilizer.

SWEET POTATO SPACING AND VARIETY TESTS—1923

Soil—Brown Loam table land.

Size of Plats—Space Test, 1/38.294 of an acre; and Variety Test, 1/19.147 of an acre.

Fertilizer Used—300 lbs. Acid Phosphate, 150 lbs. Nitrate Soda and 100 lbs. Kainit.

Date of Planting—June 25, 1923.

Date of Harvesting—October 23, 1923.

TABLE No. 9.

Sweet Potato Spacing Test

Space In Drills	Plat Yield, Pounds	Yield in Bu. Per Acre
7	280	206.2
14	232	170.9
21	210	154.5
28	159	117.1

Sweet Potato Variety Test

Variety Used—	Plat Yield, Pounds	Yield in Bu. Per Acre
Dooley Yam	481	177.1
Porto Rico	362	133.3
Triumph	530	195.2
Nancy Hall	388	142.9

Remarks—The plantings were made too late for heavy yields. Excessive rains prevented soil preparation. There are 35.3 bushels increase in favor of the 7-inch space over the 14-inch space. If we take into consideration that it will take double the number of plants and double the cost of planting, the results will be in favor of the 14-inch space.

The yields are very low in the variety test, not more than half of the yield of a normal year. The Triumph has given the largest yield; this is not out of line as it is a leading variety in yields. The flesh of this variety is white and is used almost exclusively for late summer and early fall mar-

keting. The Triumph and Porto Rico are freer from diseases than other varieties.

The Nancy Hall and the Porto Rico are the principal varieties grown in this section for market.

Seed Selection and Treatment—The seed potatoes were carefully selected, using only clean potatoes, free from disease. These potatoes were soaked ten minutes in a solution of bichloride of mercury, one ounce to eight gallons of water, to destroy outside infection. It should be remembered that bichloride of mercury is very poisonous when taken internally, but not injurious to the hands or clothes. It is advisable to give all seed potatoes this treatment at planting time, regardless of how clean the potatoes may be.

Beds—Convenience for watering has much to do with the location, also the beds should be on land where no potatoes have been grown for the past five or more years. If a sloping hillside is used, begin making the beds at the bottom of the slope and each year move up the hill. If it becomes necessary to use the same beds each year, the soil should be removed and all parts of the bed disinfected with a solution of copper sulphate, 1 pound to 20 gallons of water. A wooden vessel should be used for this solution. We make our beds five feet wide and a six foot walkway between each bed. Elevation for drainage is made by removing six inches of soil from part of the walkway and putting it on the beds. Where early plantings of potatoes are desired, or when plants are grown for sale, hot beds are used to force the plants. Either the hot bed heated by fire or with green stable manure can be used.

The potatoes are placed so as not to touch and are covered with woods dirt or clean bank sand free from infection. This covering is usually about two and one-half inches deep.

If care is used sound potatoes taken from a black rot infested house and treated as above will give good results. It is in the seed bed that most of the trouble begins. The State Plant Board has taught us a lesson along these lines. Some of the potato growers that have unlawfully brought potato plants into the State, evading the Plant Board inspection, are having it come home to them by losing their entire crop by black rot. They not only lose the crop of potatoes but also infect their potato houses and fields, making the future growing of potatoes more hazardous on their farms. Diseased potatoes fed to livestock will infect the manure and in turn the soil where the manure is used. Vetch has been seeded to all of the land we planted to potatoes. The crop of vetch is removed for hay and the land prepared and fertilized as given above. After the crop of potatoes is harvested, the vetch comes up and gives a hay crop the next spring. We advise such a practice.

Soil for Planting—There is a common belief among some farmers that thin soil is the place to grow potatoes. It is true that some potatoes can be grown on thin soil, but it is not an exception to any rule. We have never found a crop that does better on a poor soil than on a fertile one and we never expect to find one. Select a good clay or sandy loam where no pota-

toes have been grown within five years unless the potatoes previously grown were free from diseases. Make rows three or three and one-half feet apart. Plants put out early in June give good yields. An application of 300 pounds acid phosphate, 150 pounds of nitrate of soda and 100 pounds of kainit per acre applied just prior to first planting gives good results. To freshen up the land just before planting is a good practice.

Harvesting Potatoes—A hay rake will assist greatly in removing the vines. We find it satisfactory to bar off the rows so as not to cut the potatoes with a single horse turning plow, which removes most of the vines left by the rake, then in the absence of a potato digger, throw out the potatoes with a middle breaker. The potatoes are distributed along the row in every third middle. This is done to prevent bruising. Assort the potatoes in this row and pack in crates or boxes ready for use and remove to the storage house and if possible allow them to remain in the crates. Field drying will assist materially in eliminating the excessive water and should be practiced where possible. It is through bruised or cut potatoes that diseases such as ring rot, storage rot, and other diseases are introduced. Cut potatoes should be stored separately and eaten or otherwise disposed of before decay begins. Bins not over four by four feet may be used in storing the potatoes.

The storage house should be thoroughly sprayed on the inside a week or ten days before the potatoes are dug. A solution of copper sulphate, one pound to twenty gallons of water, will destroy infection.

Curing the Potato—To get rid of the excess water in the potato is the next process. If the atmosphere is dry, open all ventilators and allow air to circulate freely during the day and close up at night. Keep fire going in the furnace or stove during the day. It usually requires two weeks to dry out small houses. The thermometer should register 75 or 80 degrees during the days to get the best results in curing the potatoes. Properly cured potatoes will stand four or five degrees below freezing which is an item to be considered in marketing during the winter and the proper temperature for keeping the house is between 45 and 55 degrees during the winter. Small variations will not injure the potatoes.

Vetch—Hairy vetch is the best variety we have so far found for this section. A variety test is being studied with much interest. It is believed that vetch is one of the most valuable winter cover crops for this section, probably not any more valuable than bur clover after the land is properly seeded, but the ease in which the land is seeded to vetch and its value as hay gives it first place. The hope for Southern agriculture is increased production; this can not be had without increased soil fertility. The cheapest way to increase soil fertility is by growing legumes. Then we come to the question, what legumes should we grow? When land is once seeded to vetch, it at once becomes a volunteer winter cover crop and works nicely with the growing of such crops as sorghum, corn, sweet potatoes, soybeans, cotton and other crops. The only place we have not found advisable to grow vetch on a farm is on land planted to strawberries. Vetch will put a berry patch out of commission unless the plants are destroyed, which we have

found expensive. It appears that some farmers have trouble in getting a start with vetch. The trouble really lies in their having not been sold to the importance of soil building. We call it a fool-proof legume that will come up in the fall after all cultivation has ended and grow during the entire winter, protecting the land from washing and if let alone will produce by May 15 from one to two tons of good hay per acre that can be harvested for livestock. Any crop except cotton can be grown after vetch has ripened seed on the land sufficient to furnish seed for other crops of vetch later. Crimson clover is fine but has to be seeded to the land each fall. We have not found it hard to seed land to vetch. We have over one hundred acres in vetch. It is growing on the sides of roads, on ditches, in orchards and vineyards, and, in fact, any place we will allow to become seeded. Fifteen pounds of seed will plant an acre of land. Select good soil to start with and use some manure on the land. If the land selected for vetch is in cotton, sow the seed in the middles of the cotton rows about the first of September and cover by cultivating the cotton. Inoculate the seed by mixing about one-half pound of soil from a vetch field with each pound of seed. Allow this planting to mature seed, which it usually does by the latter part of May. Turn the entire crop under and plant to other crops. In the fall of the year when the weather gets cool and there is sufficient moisture the vetch seed that are near the surface of the ground will germinate. It may be necessary to allow this crop of seed to mature, hay can be saved and fed to livestock. Seed will shatter out of this hay in feeding and become mixed with the manure. Scatter this manure at any time desired on land to be seeded to vetch. The seed in the manure will germinate in the fall, no inoculation of these seed is necessary and you have an enlarged field of vetch. Such a method will soon put vetch over your farm. We have a two year rotation on the farm that has been in practice for over ten years:—Cotton, where vetch comes up in the fall, the vetch should be allowed to mature some seed, after which harvest the hay and turn the land and plant to corn. The next year put the land back to cotton. Land in this rotation has made two bales of cotton per acre and ninety-two bushels of corn. The soil is better now than when these crops were grown. This land will grow such crops every year that we get a good stand and get the crop of cotton started early. It is necessary to supply at least 200 pounds of acid phosphate a year to each acre of this land, also about 100 pounds of kainit to keep up the mineral matter. We grow three crops in two years on this land. This land was seeded but once and that was over ten years ago. Vetch does not do well on wet soils or a very wet year.

Control the surface water on your farm and plant vetch.

Lespedeza—The farmers of the South have not fully realized what they have in this plant. There is no better hay grown and it is probably better adapted to these soils than any other soils of the State. It is one of the easiest crops to grow, no lime or inoculation and in many instances not even necessary to plant the seed. With the idle lands on nearly every farm there is no reason why this section should not have hay in abundance to sell. We have found this plant better adapted for bringing up very poor soils than any plant within our knowledge.

Lespedeza seed planted on oats at the rate of one bushel per acre will give a good cutting of hay the fall following. The time to sow lespedeza seed is the latter part of March. Harrow the land and sow the seed on the freshly harrowed soil without covering. Many farmers have found it most satisfactory to seed about half their land to lespedeza to be used for pasture, livestock, hay and seed saving for about three years and then putting this land into cultivation and seeding down the other half of the farm for the same purposes. Such a method has kept up lands to where they produced an average of one bale of cotton per acre with the use of only two hundred pounds of acid phosphate as a fertilizer. Mississippi would grow more cotton by such a method over a ten year period than she does today.

Bur Clover—The variety known as Southern bur clover is the best to plant. The seeding of land to this crop is rather a slow process and somewhat difficult. It requires about four bushels of seed to plant an acre. The seed are light, only ten pounds to the bushel, and are frequently damaged before harvesting. Probably the best time to sow the seed is as soon as harvested. Sow in the middles of cotton and cover by cultivating the cotton. In the fall after cultivation has ended when cool moist weather begins the seed will germinate. Allow this planting to mature seed before planting the land to other crops; this will be the latter part of May. One good crop of seed will put enough seed in the land to insure a crop of clover each year for four or five years. Land once well seeded to bur clover can be planted to cotton for three or four years in succession without allowing the seed to mature. To get the best results, such land should not be turned each year to plant cotton until a short time before the cotton planting season. Anthracnose some years gives trouble with bur clover. As no hay is harvested from this crop the soil is in a few years supplied with vegetable matter and nitrogen. We have a field seeded to bur clover we expect to use in a two year rotation. A small seed plat on a farm used for growing seed is the most satisfactory way to secure seed. It is not uncommon to harvest two hundred bushels of seed per acre. These seed usually sell for around $1.50 per bushel on the market.

ALFALFA

This Station has a circular on Alfalfa Culture that can be had from the Experiment Station, A. & M. College, Mississippi. Alfalfa will grow on almost any character of fertile land in this section if well drained, by the addition of four or five tons of limestone per acre. It seems to do better on clay hill lands. We have about twenty varieties under test, the seasons for the past two years have been very unfavorable, being so wet. The Native Grown or common alfalfa appears to give as good results as any variety in the test. One acre or more near the home for hogs and poultry to furnish early and late grazing will be found very profitable.

FORAGE CROPS

Soy Beans (*Otootan Soybean*)—We have had under observation for the past three years the Otootan soybean. This variety is far ahead of any other variety we have grown on the Station. While the variety is late ma-

turing, it is a most excellent forage plant. On fair land it will produce from two and one-half to three tons of hay per acre. Medium early plantings will mature seed in this latitude. The plant is a heavy fruiter and does not shatter out in the field like some of the other varieties. The beans are small and germinate easily, requiring only about one gallon to seed an acre properly. The beans should be planted in three foot rows and given about two cultivations to get the best results. The stems of this variety are small and abundant making a growth about four feet tall on average land. When planted in the row with corn they finally cover the entire middles. We believe that this is an ideal variety for planting with corn, as well as for forage.

Lareda Soybean—This is the first year we have grown this variety of soy bean. It is at least a month earlier than the Otootan and in general appearance resembles same in the early stages of growth. The seed are small and germinate well. The variety is an abundant fruiter. It requires about one gallon of seed to plant an acre, using three foot rows. This variety has attracted very much attention in the Mississippi Delta section and bids fair to supplant to a great extent the cow-pea, which in the past has been used so bountifully.

Biloxi Soybean—This is a late maturing variety and very tall growing. On good soil this bean will grow six feet tall. The stems of this variety are much coarser than the Otootan or the Lareda, but make a fine quality of forage. The beans do not shatter out easily and we have had no trouble securing a stand. The beans are larger than the two varieties named above, requiring about two gallons to plant an acre. We look on these three varieties as being the best for forage of any varieties tested at this Station.

Mammoth Yellow Soybean—This has been a standard variety for hay and for hogs for many years. The beans are large, requiring three or four pecks of seed to plant an acre. When cut in the dough stage, no better feed can be had, for it is both forage and grain. We have had trouble securing a stand with this variety. This bean at present is probably more universally grown than any of the bean family The variety shatters out badly in harvesting if not cut at the proper time. This variety is grown for oil and hog feed to a great extent. The meal secured in the process of extracting oil is but little less valuable for feed than cottonseed meal.

DAIRYING

The dairy at this Station was installed August 1, 1909, purely as a demonstration feature on the Station.

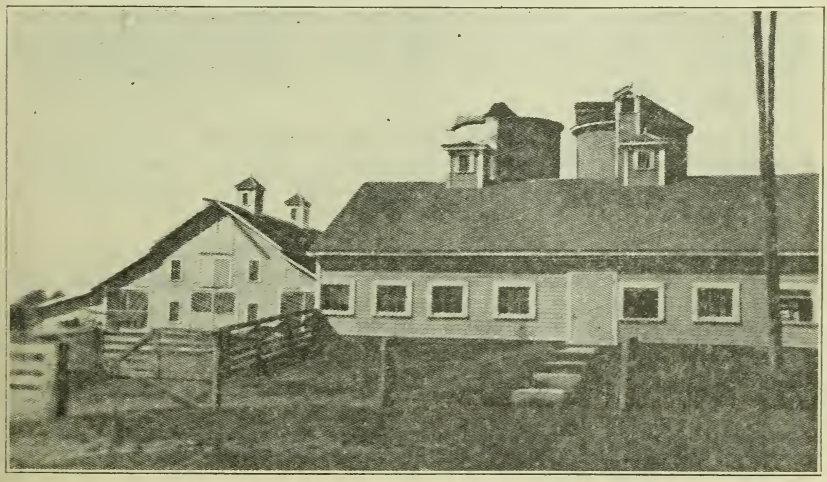
An attempt has been made to run the dairy so as not to interfere with regular Station work, leaving the experimental feature to the College herd at the A. & M. College, Mississippi; also to furnish a market on the farm for crops grown and to utilize the thin lands for grazing.

Grade cows, the kind that could be had in this county, cost an average of $33.25 each. For a time records have been kept; for a four-year period the herd averaged $65.00 net per cow. Several registered Jersey cows have

been added to the herd and in the future feeding experiments will be conducted. The value of manure measured in pounds of cotton or other crops has been a feature of our work. The dairy possibilities in this section are good. There is a creamery or milk market within forty miles and in many instances much nearer any farm in this section. There are thousands of acres of idle land that could be made to grow feed and pasture with but little expense. These lands have been put out of commission by tenant farmers growing cotton to buy hay to grow more cotton. There are good cows that can be had in almost any section without much effort. In many instances there are cows on the farms of men who could easily convert a shed (or build one) into a dairy barn and turn the cows in and go to milking. Cream separators are plentiful and can be had almost on your own terms. Many banks will lend money on cows as security to purchase other cows. Start with the best cows at hand and cull out the poorest ones by keeping records and purchase good ones in their places.

The boll weevils this year have shown us what they can do for cotton. While we believe we can still grow some cotton, the presence of the weevil makes the growing more hazardous. There is idle labor on the farm half the time that has to be fed all the time. The dairy farmer is about the only man in the country who has made ends meet for the past four years. If the idle lands of this section are ever redeemed, the dairy cow and poultry will play an important part. The richest sections of the United States today are those sections that make dairying their chief industry.

We have mild winters, cheap lands, cheap labor, long grazing seasons and can use inexpensive barns and our market facilities are just as good as any section on earth. The dairy need not interfere with the growing of cotton or other crops in the least. It will furnish a home market on the



Dairy Barn

farm for most of the crops grown. If you have good cows they will pay a good price for the feed. The cows will almost give you double value for the legumes they eat by utilizing the feed value and returning the manurial value to the farm.

We have a milking machine that has been in service over three years that has given perfect satisfaction. One person could with the use of the milking machine handle thirty cows a day, put in feed, clean up the barn and wash all milk vessels. We have had no trouble securing the desired labor. In many sections if you want to borrow money, put a few milk cans in your vehicle and drive up to your bank. Don't put off the job until it is too late. If you attempt to do dairying and buy all of your feed, you will be up against the same proposition as the cotton farmer who grows all cotton and buys feed; it will be hard to make ends meet.

LIME

We have nothing new to add to our lime results. Unfortunately our lime tests are located on level hill land and the excessive wet weather this year overcame everything; the soil was water-logged. We had over one hundred fertilizer experiments, also tests with manure in the same field, the results of which we are unable to print for the same reason.

Lime can be used in either of the following forms: crushed limestone (from one-quarter inch to dust), caustic or air slaked lime, or rotten limestone found in abundance in the Eastern and Southern parts of the State. It requires about one-half the caustic or air slaked lime per acre as it does either of the other kinds named. Two tons of crushed limestone per acre broadcasted has doubled the yield of cow-peas and soy beans. Lespedeza is the only legume within our knowledge that is not very much benefited by the use of lime. The rotten limestone could easily be handled without crushing. By breaking the larger pieces and distributing on the land, the weather will in a short time cause these lumps to break up and in time it will become scattered over the land. It would require more than two tons per acre in this way.

All of the clovers, vetches and alfalfa are benefited by the use of lime. In fact alfalfa can not be grown in this section without an application of four or five tons of lime per acre. One application of lime usually lasts for five or six years.

We believe these soils can be handled profitably only by terracing the lands, the use of two or three hundred pounds of acid phosphate per acre yearly, the use of two tons of limestone as a minimum to assist in growing legumes, from one to two hundred pounds of nitrate of soda to supply additional nitrogen according to the crop grown, the dairy cow to utilize the legumes grown and grazing lands and in no other way can they be maintained so cheaply and profitably.

In closing this report, we wish to state that Mr. H. F. Wallace and Mr. O. M. Ryan have done their best in making this a most profitable year, even under the most adverse weather conditions.