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Report from Holly Springs Branch Experiment Station - for 1915 to 1920 inclusive

C. T. Ames

BULLETIN NO. 193 DECEMBER, 1920

REPORT FROM

HOLLY SPRINGS BRANCH EXPERIMENT STATION

FOR 1915 TO 1920 INCLUSIVE

BY C. T. AMES

Photograph of this cut of hairy vetch taken May 1, 1917. *This vetch was sown in cotton middles at the last plowing in the summer before.* (*See two-year rotation, page* 19.)

MISSISSIPPI AGRICULTURAL EXPERIMENT STATION
Agricultural College, Mississippi

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Report of the Work at the Holly Springs Branch Experiment Station

By C. T. AMES

INTRODUCTION

The Holly Springs Branch Experiment Station has been carrying on certain cotton, corn and fertilizer experiments for a number of years to obtain information that would be of value to farmers of North Mississippi, and especially to those living in the brown loam belt of the State. These results have been published from time to time, in bulletins issued by this station, and in cotton and corn bulletins 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. This arrangement makes it possible to supply growers with only the data in which they are especially interested. Two bulletins, one on corn, No. 189, and one on cotton, No. 192, have just been published by this Station; these deal more fully with those subjects than this report. This bulletin contains a discussion of and certain data on the following: Variety tests of cotton on hill and valley land; cotton spacing; fertilizer tests with cotton, corn, and legumes; corn and sweet potato variety tests; the growing of crimson clover, burr clover and velvet beans; and the relation of dairy to farm.

EROSION.

The desire to find a practical and satisfactory method of controlling soil erosion in the northern hill section of the State, no doubt had much to do with the location of this Station. As Bulletin No. 165 discusses the subject of soil erosion, and the most practical methods we have found of controlling same, only brief mention of the subject will be made here. It has been demonstrated time and again that land can be terraced for $1.00 per acre, unless the land is badly broken. This is for labor alone, under normal conditions. Any man can terrace any sized farm easily with the labor it takes to cultivate the farm, between the time the crop is harvested in the fall and the beginning of a crop the next spring.

A vast majority of the farmers, in this section, are, each year paying the penalty of soil terracing neglect by shorter crops and poorer land. It is almost useless to attempt to build up any soil that washes with every rain Winter cover crops will assist very materially; planting the broken lands in grasses for pasture will also help; but neither of these methods can be expected to give satisfactory results without a system of broad shallow terraces to control the surface water that falls during heavy rains. Both State and Federal Government forces can be secured to assist in terracing work.

COTTON.

Varieties—The variety grown in any section is of far more importance than is generally understood. The past fifteen years in our variety tests there has been an average of thirty-five dollars difference per acre each year, between different 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 the best quality. We recommend the following varieties for this section.

For Hill Land—Cleveland 37W-54, Wannamaker-Cleveland, Miller, Cleveland Big Boll, Triumph and Cook. For Valley Land—Wannamaker Cleveland, Trice 270-41, Express-122-433, Webber 49 and Sunflower.

Wannamaker-Cleveland, Cleveland Big Boll, Triumph and Miller are all below their usual standing in 1920. 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 staple 1 1-16 inches in length.

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 values. During the war and at present, when a much wider difference in price per pound exists, the long staple varieties give the highest money values. No variety of cotton that pulls less than one inch staple should be grown, 1-16 inch longer would be better. In many sections where very short varieties are grown, the buyers pay from two to three cents less for all the cotton grown. Some of the best buyers do not establish offices in such sections.

TABLE No. 1 SEVEN YEAR COTTON VARIETY TEST ON VALLEY LAND.

Variety Cotton	1914 Pounds of Seed Cotton	1914 Money Value of Seed Cotton	1915 Pounds of Seed Cotton	1915 Money Value Seed Cotton	1916 Pounds of Seed Cotton	1916 Money Value Seed Cotton	1917 Pounds of Seed Cotton	1917 Money Value Seed Cotton	1918 Pounds of Seed Cotton	1918 Money Value Seed Cotton	1919 Pounds Seed Cotton	1919 Money Value of Seed Cotton	1920 Pounds Seed Cotton	1920 Money Value of Seed Cotton	Length of Staple
Simpkins	1863	53.48	1843	83.46	1594	146.29			1187.3	149.65	1240	200.03	1953	121.94	1
Cook	2464	75.17	1966	105.17	1508	135.48	874	112.44							7/8
Trice	1948.8	58.93	2116	98.34	1872	158.90	1044.8	121.09	1111	138.37					1 1/16
Triumph	2052	64.84	2109	118.06	1625	166.42	963.7	142.40	1208.3	173.15	1480	271.01	1263.8	95.4	1 1/16
Durango	2111	96.79	1858	108.19											1 3/16
Haaga's Wonderful			1980	106.41											1/2
Dodd's Prolific	2199	60.70	2066	97.51			1058.2	139.64	1325.1	165.32					1 1/16
Wannamaker Cleveland	2376	73.47	2246	120.38	1521	134.57	994.6	132.55	1609.	220.13	1480	246.82	1766.4	121.59	1
Miller	2355	83.82	2218	121.51	1632	164.28	971.5	135.58	1589.	209.49	1120	185.23	1871.7	128.17	1 1/16
Cleveland Big Boll	2452	74.56	2325	121.17	1261	107.76	905.7	117.65	1435.	197.52	1504	242.63	1737.7	112.86	1 1/16
Cleveland-027-11-24			2275	104.84	1723	152.58									1
Lone Star 132			2260	111.97			1067.8	144.60	1305.7	164.00					1 3/16
Foster			1930	113.35			1044.7	155.26							1 3/16
Express General	2254	92.16	2189	114.08	1508	122.91									1 3/16
Foster No. 11			1987	115.43											1 1/4
Lone Star-15			2153	116.13	1612	185.31	1117.9	170.06	1284.6	181.87	1336	221.28			1 1/16
Lone Star-11			2131	119.03			1157.8	170.65	1308.9	181.96	1328	264.19			1 1/16
Express-15			2239	119.83											1 1/8
Polk			2232	120.73	1385	142.78	848.1	122.18			1320	255.92			1 3/16
Sunflower	2161	74.40	1865	124.92	1203	133.74					1304	317.59			1 5/16
Express-122			2260	125.20	1586	149.50	1187.3	156.60							1 3/16
Unknown	1907	85.59	2254	137.35	1573	170.76	1221.2	166.66							1 3/16
Lone Star					1502	161.16									1 1/16
Holdon					995	100.33									1 1/16
Columbia	2090	93.33			1209	129.49	632.2	96.08	1430.6	196.80	1208	234.19			1 5/16
Express-350					1827	182.35	1395.5	189.52			1232	197.21			1 3/16
Express-341					1573	163.32									1 3/16
Panther Burn					1105	115.37									1 1/4

TABLE No. 1 Continued.

Variety Cotton	1914 Pounds of Seed Cotton	1914 Money Value of Seed Cotton	1915 Pounds of Seed Cotton	1915 Money Value Seed Cotton	1916 Pounds of Seed Cotton	1916 Money Value Seed Cotton	1917 Pounds of Seed Cotton	1917 Money Value Seed Cotton	1918 Pounds of Seed Cotton	1918 Money Value Seed Cotton	1919 Pounds Seed Cotton	1919 Money Value of Seed Cotton	1920 Pounds Seed Cotton	1920 Money Value of Seed Cotton	Length of Staple
Columbia Sherard's							859	120.06							1 3/16
Express-32							1267.5	170.32							1 3/16
Trice 270-41							1557.4	211.51			1552	236.55			1 1/8
Foster 120-437							1121.8	164.64							1 1/4
Webber-49							801		1330	182.71	1344	262.81	992.6	160.16	1 1/4
Rowden							928.2	125.42	1346	191.83					1 1/8
Sproull's Big Boll							804.9	106.00							1 1/16
Ped'g'd-Wan-m'r-Cleveland									1609	221.98					7/8
Cook-1010									1589	226.42			1871.7	130.30	7/8
Half and Half	2304	78.40							1613	213.82					3/4
Mexican Big Boll									1503	201.79	1304	204.04	1814.3	112.20	1 1/16
Sunbeam									1463	193.17	872	136.10			7/8
Lone Star 132-467									1235	145.54					1 3/16
Express 122-4104									1362	177.98					1 3/16
Express 122-475									1321	166.74					1 1/16
Express 122-433									1235	161.07	1440	273.51			1 3/16
Express 432									1560	216.01	1224	226.49			1 1/8
Foster 120-449									1138	150.66					1 1/8
Hartsville No. 12													1082.0	176.83	1 3/8
Vandiver's Heavy Fruiter													1140.7	116.78	1 1/16
Huffman													1279.3	119.15	1 1/16
Coker's Pedigreed Cleveland													1223.9	128.30	1 1/16
Cleveland 37w-54													1310.6	133.73	1
Smith's Cleveland													1328.8	131.14	1 1/16
Express 122-433													1291.6	131.95	1 3/16
Acala No. 5													1008.1	140.78	1 3/16
Cook 588													1088.2	110.29	1

COTTON CULTURE.

Fertilizers—In all of North Mississippi, excepting parts of the Prairie and Mississippi Delta, where fertilizers do not pay, the use of from 200 lbs. to 400 lbs. of a high grade fertilizer per acre will be found very profitable. Fertilizers that will analyze from 10 per cent to 12 per cent phosphoric acid and 3 to 4 per cent nitrogen should be used. Where a large quantity of a leguminous crop is turned under, 200 lbs. of acid phosphate may be sufficient. A mixture of 200 lbs. cotton seed meal and 200 lbs. acid phosphate; or 100 lbs. nitrate of soda and 200 lbs. acid phosphate; are the most economical quantities of fertilizer for soils of ordinary fertility.

Apply all mixed fertilizers under the seed before planting. When nitrate of soda is used, it may be applied with the acid phosphate at planting time, or after first working of the crop. During wet seasons or when the crop is infested with coco grass, the latter method should be used. 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.

COTTON SPACE TEST.—FIVE YEAR AVERAGE.

Soil—Hill land slightly rolling.

Plots—Six rows each (except in 1920 when four rows were used), repeated from two to four times. Plots range in size from 1-20 to 1-4 acre each. An extra row, of which no record was taken, was grown between plots to regulate width of rows.

Three tracts of land were used in the five-year test. An average of about four hundred pounds per acre of a mixture of acid phosphate and cotton seed meal was used each year.

TABLE No. 2—Five Years' Spacing Results with Cotton.

VARIETY.	Width of Row in Feet.	Drill Space in inches.	Yield of Seed Cotton per A in 1916	Yield of Seed Cotton per Acre, for 1917	Yield of Seed Cotton in lbs. per acre for 1918	Yield of Seed Cotton in lbs. per acre for 1919	Yield of Seed Cotton in lbs. per acre for 1920	Five Year Average.
Triumph	3	9	1135					
Cleveland Big Boll	3	9	1290	652.5	1435	1608		
Sproull's Big Boll	3	9	1161					
Wannamaker Cleveland	3	9		594	1400	1503		
Columbia	3	9		405				
Sherard's Big Boll	3	9			1330			
Trice 270-41	3	9				1245		1151.4
Triumph	3.5	12	1304					
Cleveland Big Boll	3.5	12	1632	490	1216	1530		
Sproull's Big Boll	3.5	12	1326					
Wannamaker's Cleveland	3.5	12		502	1320	1380	1249.6	
Columbia	3.5	12		338				
Sherard's Big Boll	3.5	12			1140			
Trice 270-41	3.5	12				1740		1308.8
Triumph	4	16	1274					
Cleveland Big Boll	4	16	1467	513.9		1155		
Sproull's Big Boll	4	16	1158					
Wannamaker Cleveland	4	16		625.5		1272		
Columbia	4	16		388.8				
Trice 270-41	4	16				1050		989.4
Sproull's Big Boll	4	9	1255					
Cleveland's Big Boll	4	9		642.6	1107	1338		
Wannamaker Cleveland	4	9		609.5	1239	1272		
Trice 270-41	4	9				1272		
Columbia	4	9		422.6				
Sherard's Big Boll	4	9			1036			1019.3
Cleveland Big Boll	4	6		786				
Wannamaker Cleveland	4	6		777.6				
Columbia	4	6		693.1				752.2
Cleveland Big Boll	3	16		922.5	883	1050		
Wannamaker Cleveland	3	16		1057.5	1093	1032		
Sproull's Big Boll	3	16	1367					
Columbia	3	16		652.5				
Sherard's Big Boll	3	16			1032			
Trice 270-41	3	16				1152		1024.1
Cleveland Big Boll	4	12			1128			
Wannamaker Cleveland	4	12			1096			
Sherard's Big Boll	4	12			990			1071.5
Wannamaker Cleveland	3.5	6					1207.6	1207.6
Wannamaker Cleveland	3.5	18					1284	1284
Wannamaker Cleveland	3.5	24					1138.7	1138.7

Remarks—In the above table for 1917 when four-foot rows and six-inch space was used, the average was 752.2 pounds. To get a correct idea of standing of cotton so spaced compare the 752.2 pounds with the average of other plots for 1917. It will be seen to rank second in yield.

Conclusions—From the average results of five years it appears that land that, with fertilizer added, will produce an average of three-quarters of a bale of cotton per acre, should be planted in three-and-one-half-foot rows, and thinned to ten or twelve inches in the row. On land that will not produce this amount of cotton, three-foot rows and closer spacing will probably give best results.

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 caused by a fungus growth that develops within the plant. The fungus may live in the soil for years. Crop rotation helps. The best known method for controlling this disease is to plant wilt resistant varieties. Seed from plants not affected when grown on infected soil, if selected may develop much better varieties for growing on infected soils.

Cotton Rust—One hundred pounds of Kainit per acre, checks black rust in cotton very materially.

TABLE No. 3—Thirteen Years' Results from Fertilizers Under Cotton.

Plot No.	200 lbs. Fertilizer per Acre.	Eight-yr. average in lbs. as reported in Bul. No. 165 this Station	Pounds of seed cotton per acre 1914	Pounds of seed cotton per acre 1915	Pounds of seed cotton per acre 1916	Pounds of seed cotton per acre 1917	Pounds of seed cotton per acre 1918	Thirteen year average in pounds of seed cotton
1	Check	464	670	350	590	390	525	474.5
2	200 lbs. Cottonseed Meal	824	940	700	960	780	600	810
3	200 lbs. Acid Phosphate	1000	1170	880	840	740	701	933.2
4	200 lbs Kainit	584	760	590	580	540	620	601
5	Check	487	654	500	680	530	570	536.5
6	100 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	948	1110	830	880	800	635	899.5
7	100 lbs. Cottonseed Meal 100 lbs. Kainit	714	760	440	680	620	650	702.6
8	100 lbs. Acid Phosphate 100 lbs. Kainit	838	950	670	860	600	570	784
9	120 lbs. Acid Phosphate 40 lbs. Cottonseed Meal 40 lbs. Kainit	843	940	594	540	580	415	726.5
10	Check	468	560	360	460	460	430	461
11	150 lbs. Cottonseed Meal 50 lbs. Acid Phosphate	779	930	430	640	710	465	707
12	100 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	799	980	570	640	625	465	727.5
13	50 lbs. Cottonseed Meal 150 lbs. Acid Phosphate	801	840	600	480	660	490	707.5
14	Check	481	540	420	290	320	390	436.5
Plot No.	400 lbs. Fertilizer per Acre.							
1½	Check	435	580	340	540	400	475	461
2½	400 lbs. Cottonseed Meal	736	670	540	920	640	610	706
3½	400 lbs. Acid Phosphate	821	1340	860	820	750	545	843.2
4½	400 lbs. Kainit	598	640	390	600	565	600	578.5
5½	Check	555	420	430	765	600	500	540
6½	200 lbs. Cottonseed Meal 200 lbs. Acid Phosphate	1070	1310	870	1000	940	600	1007
7½	200 lbs. Cottonseed Meal 200 lbs. Kainit	858	1060	900	790	765	860	856.5
8½	200 lbs. Acid Phosphate 200 lbs. Kainit	999	1040	740	680	500	520	847.5
9½	240 lbs. Acid Phosphate 80 lbs. Cottonseed Meal 80 lbs. Kainit	1045	1190	760	610	590	500	887.5
10½	Check	445	540	350	460	440	530	454.5
11½	300 lbs. Cottonseed Meal 100 lbs. Acid Phosphate	1059	1280	760	940	1000	625	990
12½	200 lbs. Cottonseed Meal 200 lbs. Acid Phosphate	1030	1010	720	760	970	725	943.5
13½	100 lbs. Cottonseed Meal 300 lbs. Acid Phosphate	760	930	490	450	660	535	686.5
14½	Check	430	500	360	260	410	415	409.5

Remarks on Table 3.

Plots—Plots were located in the field as indicated in table. The plots were 1-20 acre each, 6 rows 4 feet wide, and 92 feet long.

Soil—Brown loam hill land.

Conclusions—Applications of both nitrogen and phosphorus are beneficial; 200 lbs. cotton seed meal and 200 lbs. acid phosphate per acre have given best results.

EIGHT YEAR VARIETY TEST WITH CORN.

Soil—Brown loam valley land.

Plots—One row plots repeated five or six times, containing from one-twentieth to one-tenth an acre each.

Fertilizer—From 300 to 400 lbs. of cotton seed meal and acid phosphate mixed and applied under the seed. Two crops of crimson clover and two crops of wheat and vetch were also grown on the land during the past nine years.

TABLE No. 4—Eight Years' Variety Test with Corn.

NAME OF VARIETY.	Planted May 17, 1912	Planted April 5, 1913.	Planted May 14, 1914	Planted June 14, 1914	Planted April 19, 1915	Planted June 16, 1915	Planted June 16, 1916	Planted April 18, 1917	Planted May 5, 1919	Planted June 9 1920; yield in shelled corn, per acre; bushel	Actual Yield in pounds per plat.	Per ct. of shelled corn per bushel
Tennessee Red Cob	52.0		80.5	50.2	55.1	33.9	26.8	34.2	56.2	61.11	255.5	75.0
N. C. Prolific (Home Grown)		48.0	78.0		54.4	63.6	30.8					
Batt's Prolific	58.3	52.0	67.0	45.9	52.2	48.1	30.8					
Cocke's Prolific	51.2	53.9	87.0	48.7	51.2	47.3		34.7	80.4	41.86	233.0	75.7
Florida Flint	53.4	39.6	74.7	38.4	49.8	38.4	28		62.8	45.24	241.5	72.9
Davis' Poor Land Corn	54.6	49.8	75.0	50.2	49.1	43.6						
Vardaman's Stooling Corn		57.8	79.0	53.7	48.6	42.0	23.6	31.6	67.0	34.49	210.5	84.0
Reid's Yellow Dent					46.9	34.4						
Mosby	54.0	43.0	75.5	53.5	46.8	40.9	31.8	30.2		38.72	218.5	78.5
Mosby (Woodruff's)							33.6		71.2	43.19	228.0	79.2
Alexander's Six-Ear					46.6	36.7	26.6	33.2				
Boone Co. White	45.5	47.1	65.5	41.0	45.8	41.4	30.4	29.6				
N. C. Prolific					43.8	49.6		33.6	67.7	34.99	217.5	82.6
Rockdale	54.0	36.7	60.8	37.0	38.4	22.9		19.7				
Goliad						46.3		33.9				
Johnson's Prolific						36.1			62.6			
Marlboro	63.0						34.4	40.5	65.7	50.20	240.0	72.2
Hickory King							30.0			49.53	217.5	73.6
Neal's Paymaster							44.0		69.2			
Alabama Expt. Station Yellow							30.5					
New Era			73.9	45.5								
Hasting's Prolific	51.2	47.1	77.5	47.0	45.8	47.7	25.8	32.0	61.6	42.04	207.0	77.8
Mosby Rhodes			83.3	43.3					66.9			
Leaming		30.5	54.4	34.0								
Munson	57.9	47.1	73.0	50.0								
E-1	56.2	49.4										
Jones' Prolific		49.4	92.2	48.1	46.2	46.7	38.2			39.95	237.5	76.4
U. S. D. A. No. 195								34.2				
Williamson								47.3				
Johnson Co. White								38.4		46.99	236.0	75.7
Jones' Vardaman									60.4	39.99	236.5	84.0
Simmons' Prolific								65.7		49.07	230.5	73.6
Ferguson's Yellow Dent								44.0				
Sure Cropper								70.1				
Giant Tennessee Red Cob								87.5				
Paymaster (Station)								73.7		51.92	249.5	79.9
Mosby-553										41.61	217.5	77.8
Paymaster (Harpeth)										61.63	275.0	73.6
Tennessee Red Cob-72										57.60	242.5	72.2
Garric										46.43	223.0	67.4

It may be seen in the foregoing table that the prolific varieties in most instances have given the highest yields; such varieties as Cocke's Prolific, Mosby, Hastings, North Carolina Prolific, Jones Prolific, Vardaman, and Davis Poor Land Corn. In the past few years, selections from Tennessee Red Cob, a large eared type, have been taking the lead. Neal's Paymaster, Station Paymaster, and Tennessee Red Cob are illustrations.

SEED CORN.

Every farmer should, as far as possible, select his own seed. If he finds that he has not the best variety and cannot obtain good, sound seed from his own farm, he should buy his seed from some good seed breeder in his own section, and not send to some distant state for it. This is particularly true of northern and western grown seed. Seed of the above mentioned varieties that has been grown and selected by a good breeder anywhere in the southern states, especially east of the Mississippi river, will give good results in this section. The planting of early varieties of corn, especially where the seed has been obtained from the northern states, should be discouraged. These varieties are always low in yield, and the quality of the grain is poor. Many farmers in order to get some early feed, plant these early northern grown varieties. Every farmer who has been attempting to grow these varieties, knows that they are very inferior, and as a usual thing, he never tried them the second time.

FERTILIZERS FOR CORN.

The use of commercial fertilizers under corn has not been a very paying investment as is indicated by the majority of the fertilizer experiments conducted at this Station. Nitrate of soda, or nitrogen in some form, applied to the crop at planting time, or after the first working, has given the best results. The inability of soil, deficient in humus or organic matter, to retain the proper amount of moisture is the greatest limiting factor in producing large yields. When legumes have not been grown and but little acid phosphate used on previous crops, apply from 150 lbs. to 200 lbs. acid phosphate and 75 lbs. to 100 lbs. of nitrate soda per acre, or its equivalent in other forms of nitrogen. Apply acid phosphate before seed planting and nitrate of soda after first working on top of the soil near the plants. If other forms of nitrogen are used, such as cotton seed meal, or high grade tankage, it may be applied with the phosphate before planting.

From results indicated in the fertilizer tables, it appears that corn planted in five-and-one-half, or six-foot rows and left thick enough in the drill to make up for the extra width, and the middle between the rows planted either to soy or velvet beans, has given good results. Such a method does not reduce the yield of corn and the beans make a better growth. This plan gives the beans as an extra crop. Use 200 lbs. per acre of acid phosphate under the beans for the best results.

Probably the most economical results are obtained, when only nitrate of soda, or some other readily available nitrogen is used. If nitrate of soda is used, 100 lbs. to the acre applied at the time of planting, or at the time the corn is given the first working, seems to give the most economical returns. However, we know that these soils are deficient in phosphorus and applications of acid phosphate, mentioned above, usually give paying returns.

SWEET POTATOES—FOUR YEAR VARIETY TEST.

Soil—Brown loam hill land of ordinary fertility.

Plots—One row each repeated five times. Three different plots of ground were used in the tests.

Rows—Three and a half feet, plants eighteen inches apart in the row. It was necessary to do some replanting each year to secure a good stand.

Fertilizers—An average of 200 pounds of cotton seed meal and 200 pounds of acid phosphate per acre was used each year. A larger quantity may be advisable.

TABLE No. 5—Four-Year Variety Test—Sweet Potatoes.

VARIETY.	Yield in bushels per acre in 1913	Yield in bushels per acre in 1915	Yield in bushels per acre in 1916	Yield in bushels per acre for 1920	Four y'r average per acre in bush.
Triumph	224	336.9	229	384.5	293.6
Dooly Yam	144	301.4	148	193.4	196.7
Gold Coin	170	300.6	250		240
Porto Rican Yam		299.5	206	338.6	281.4
Nancy Hall	173	290.5	188.4	309.8	240.4
Southern Queen	109	283.3	167.2		186.5
Bunch Yam	166	237.5	128		
Common Running Yam	66	133.6	148.4		
Spanish				173.8	

The sweet potato is one of the best money crops in the loam and sandy soil of the State. It is one of the few plants that will make fair yields on thin land. With a proper knowledge of the diseases that attack the plant, and how to grow and handle the potato, it should be a rival with cotton on many farms in the State. Every farmer should grow at least enough for the farm. The demand for the sweet potato is growing rapidly as it is becoming better known in the northern markets. It should be an easy matter to have sweet potatoes for the table at least eight months in the year, and it is not out of the question to have them every day in the year.

Culture—While the sweet potato will make a fair yield on thin soil, a much larger yield can be had from a better grade of soil. From three to three-and-one-half foot rows may be used according to the soil's fertility, and plants from twelve to eighteen inches apart in the row according to the variety grown. Such varieties as the Triumph that grow very large potatoes, should be planted close together in the row.

Diseases—Black Rot is the most serious disease that attacks the sweet potato in the State, and, no doubt, is the cause of the greatest loss sustained by the grower each year. It appears in dark patches on the surface of the potato; and may also be seen upon the base of the young slips before they are set out.

The Potato Wilt or Stem Rot is also a serious disease attacking the sweet potato, but is not very prevalent in the State. This disease is caused by a fungus that lives in the soil and enters the plant through the roots. Soils once infected remain so for several years.

Dry Rot is a storage rot and not a field disease, as is thought by many. The storage house should be thoroughly disinfected while empty.

Remedies—Secure, if possible, seed potatoes grown on land free from the above diseases. Crop rotation is necessary in both cases. Seed treatment cannot be advocated as a remedial measure for stem rot, since the disease is internal and cannot be reached by any disinfectant From sets planted on non-infected soil, make vine cuttings and plant these cuttings on soil where potatoes have not recently been grown.

In case you cannot secure potatoes you know are free from disease, select only those that are sound Take vine cuttings early and plant as above. To prevent disease from entering the farm bed the potatoes and grow the crop on land where no plants have been grown for several years. Infection is easily obtained from the potato bed.

HARVESTING THE SWEET POTATO.

The potato should be dug before the vines are killed by frost. Remove the vines by the use of a common hay rake. A common method is to bar off both sides of a row with a turning plow and throw the balance of the row out with a middle buster. The potatoes should be assorted in the field using great care to prevent bruising. They should be gathered in hampers or boxes and assorted as gathered and stored in frost proof potato houses, arranged for proper ventilation, or placed in properly ventilated bins.

Several weeks before potatoes are dug the potato houses should be cleaned and sprayed with a solution of formaldehyde and water, 1 pound to 30 gallons of water, and allowed to dry out thoroughly, before using.

Curing the Potato—A fire should be started in the stove of the potato house the day before harvesting begins, and the stove kept hot each day with all ventilators open, while digging is in process. The house may be closed at night unless the weather is dry and warm. After the potatoes are harvested the stove should be heated so the thermometer will register 80 degrees to 85 degrees F., with as much ventilation as possible to get the desired heat. In two to three weeks the potatoes should be sufficiently dried out. The time required will depend upon the weather to some extent. The house should be kept around 55 degrees all the winter, and would be best for it not to vary more than 10 degrees either way.

Many growers have no trouble in keeping potatoes in the old style, potato bank, or house.

Securing seed potatoes free from diseases, harvesting before the frost kills the vines, handling carefully without bruising, and getting rid of the excessive moist-

ure as soon as possible after digging and preventing them from freezing in winter, is the entire secret in keeping the potato almost any length of time.

PASTURES.

The best pasture combination for this region is lespedeza, bermuda grass, white and southern bur clover. After the soil has grown this combination for a few years, blue grass can be easily introduced. On the lime soils red and alsike clover may also be used. On fertile soils bermuda grass can be easily grown from seed. Five pounds of seed per acre, sown on a well prepared, firm seed bed about the middle of May, will give good results, if the weeds are kept down by mowing, and the stock kept off until the plants get a good start. On thin soils it is much safer to sod the bermuda. This can be done at almost any season of the year. The most satisfactory time is during the open weather in mid winter. The only precaution necessary, is to prevent the sod from freezing after it has been dug. This can easily be accomplished by digging the sod and planting the same day, being careful to cover it so it will not freeze. During this season pastures are idle, farm work is not rushing. When the pasture season arrives, the productiveness is reduced very little.

Fifty Acres Sodded to Bermuda Grass in Mid-Winter—During the winter of 1915-1916, a fifty-acre pasture of lespedeza on the Station farm was sodded to bermuda grass. The land was not broken broadcast, only furrows were opened six feet apart. The bermuda sod was turned shallow with a double horse plow and chopped into blocks about two to three inches square, hauled in wagons and dropped in the open furrows about two feet apart, and covered deep with a double horse plow. No more furrows should be opened, or sods dug, than can be covered the same day. Where this plan is followed, it is easy to begin work a few hours after a rain, or even when the soil is slightly frozen, with but little damage to the soil. During the latter part of February or early March, after danger of a heavy frost was over, these ridges or rows were cut down with a small disk harrow, and the land smoothed with a section harrow. This method brings the bermuda sod near the surface, and also exposes the lespedeza seed so they will germinate at the proper time. The cost of doing this work, estimating the labor at $1.00 per day, was four dollars per acre for labor alone. This method has proven very satisfactory in securing a bermuda pasture. Land thus sodded four years ago is now about solid in bermuda grass, and will easily carry double the amount of livestock, per acre.

Seeding Pasture to Bur Clover—The most satisfactory method we have found for seeding pastures to bur clover, is as follows: During the latter part of August run furrows six feet apart with a shovel plow, lap two furrow slices on this furrow with a small turning plow and harrow the ridge flat. During the latter part of September, after a rain, place seed in a sack, and rinse in clean water, thus inoculating the water, then put sack containing seed in boiling water one minute, and then return to the first water used, to re-inoculate the seed. A small quantity of soil from a bur clover field, or from an alfalfa or melilotus field can be mixed with the seed to make sure of perfect inoculation. The seed may be planted with a common cotton planter, set as for planting cotton. In our experiment the seed germinated in a few days, and in two years the pasture was solid in bur

clover. If the land is thin it is advisable to use an equal mixture of cotton seed meal and acid phosphate, at the rate of 200 lbs. per acre, in the first furrow opened in preparing the seed bed. This will give the clover a good start, so it will be better able to stand the winter freezes. Land planted to grasses and clovers mentioned above will easily care for four times as much stock, per acre, for a much longer grazing season each year, than the common pastures found in this section. On account of dry weather in the fall, some years, bur clover on poor pasture land may not germinate early enough to withstand the winter. Where the land is cultivated no trouble of this kind may be expected if the clover was grown on the land the year before.

Black Medic experiments are giving promise. Indications are that this plant will grow best where additions of lime are made. If it can be successfully grown without very much expense, it will prove a most valuable plant for this section, as it is easily scattered over lands by stock and furnishes late fall, early spring and summer grazing.

Crimson Clover—Crimson clover is a most valuable winter legume for the non-lime section of the State. While the plant responds readily to the use of lime, it grows well without lime. With the exception of wet land, it adapts itself to almost any character of soil in the State, not deficient in vegetable matter. Many farmers have failed with this plant on account of seeding very thin and poorly cultivated clay land late in the season, land so thin it will not make a paying crop of any kind, and as a result, the plants are lost the first freeze. The chances for growing this clover on thin land are very much increased by early planting, say by the middle of September if there is sufficient moisture in the soil, by heavy inoculation, and by the use of fertilizers. An application of ten tons of stable manure per acre, on the spring crop, has enabled this Station to succeed in growing clover the following fall on land that failed the year before. The growing of velvet beans, cow peas, soy beans, or lespedeza will have a similar effect. A firm seed bed that has been well cultivated during the summer, regardless of the kind of crop grown on the land is ideal. Cow pea stubble disked and harrowed thoroughly, and planted after a rain, gives very satisfactory results. It is a mistake to turn under a heavy amount of vegetable matter in the fall and then attempt to seed to crimson clover. If the vegetable matter is turned under the latter part of July and disked, harrowed and rolled, and then harrowed after the roller and after each rain until the seed are planted, results should be satisfactory.

Cut No. 2 shows crimson clover growing between cotton rows. This clover was planted the latter part of September in the cotton middles, and was covered by a shallow cultivation of the cotton. About 50 lbs. per acre of home grown seed in the hull was sown. The cotton made an average yield of 2150 pounds of seed cotton per acre. This photo was taken April 12th, 1916. The clover was turned April 16th, and prepared for planting in cotton. It is advisable to either turn clover sod earlier, or to follow with corn or some other crop besides cotton. Cotton must get an early start to be profitable.

Cut No. 2. CRIMSON CLOVER

Time for Planting—After a rain from the middle of September to the middle of October, in this latitude. We have had the best results planting about the 25th of September. Home grown seed have proven more satisfactory than any we have been able to buy Where only the middles between the rows are to be planted, 12 to 15 pounds of clean seed per acre should be used. Where the land is to be seeded broadcast 18 to 20 pounds is sufficient. Where seed in the hull are used about double the number of pounds given for clean seed are needed.

Inoculating—Excepting lime soils, any land seeded to clover for the first time, should by all means be inoculated. The cost in time and money amounts to almost nothing. Dissolve one quarter of a pound of common glue in hot water, moisten the seed with the glue water, then add about one half pound of soil from a well inoculated field of clover to each pound of seed and mix well. The seed should be covered promptly after sowing.

Harvesting the Seed—When the heads have turned brown and the seed are easily removed, they should be harvested. As the seed shatter off very easily, much care should be exercised to prevent a loss. Cutting with a mowing machine and using a common oat thrasher run at low speed gives fair results, but does not remove all of the hulls, nor can all the seed be saved. In a small way the seed can be saved by hand stripping, or by the use of what is known as a seed stripper. It will be hard to save more than 50 per cent of the seed with the strippers, but even with this loss enough seed can be saved from one acre, with very little expense, to plant ten or more acres.

Crimson clover makes as good a quality of hay as can be found, if cut just before full bloom and cured properly. In this latitude, it is usually ready to cut about the middle of May, a very busy season with most farmers. We look upon the plant from a grazing and soil building standpoint alone, and feel that it has few equals as a winter legume if properly grown.

Why We Should Grow Crimson Clover—It grows in the fall and early spring, occupying the soil when not needed for the ordinary farm crops. It prevents soil washing, to a certain extent, during the winter months, if the land is properly terraced. When sufficient early fall growth is secured, it furnishes late fall and early spring grazing for all kinds of livestock. It utilizes nitrogen from the air, and gathers some from the soil, that would otherwise be lost by leaching. When turned under it adds organic matter equal in value to ten or more tons of stable manure, depending upon the growth obtained. The cost of seeding is very small in comparison with the results obtained.

Velvet Beans—The Velvet Bean is one of the greatest summer legumes. The plant will adapt itself to almost any character of soil in the State, and can be especially recommended for building up thin soils. In this section of the State it should not be grown for seed, but as a soil restorative crop, as but few seed will mature unless planted very early. The seed may be planted after grain or some other crop, or in corn. Better results will be had if planted with some crop that will support the vines. To get the best results the seed should be planted as soon as danger of frost is over, and the soil has begun to warm up, which will be about cotton planting time. A common method is to plant two rows of corn and one of beans. It is far better to make heavy planting of beans, and to secure the best of seed that can be had, as poor results are too often had from the planting of poor seed. Use not less than one peck of good seed per acre After frost the velvet bean and vines furnishes fine grazing for livestock.

Two-Year Rotation.

First Year—Cotton, with vetch planted in middles at last working.

Second Year—Corn, after the vetch has been harvested which is about June first.

About one-fourth bushel per acre of either Hairy or Spring Vetch, may be sown, prior to last cultivation of cotton. After proper season begins in the fall, the vetch will germinate and make some growth before cold weather. It makes its heaviest growth in April and May, maturing the latter part of May. The first year the vetch should be allowed to mature fully, the vines turned under, and the land seeded to corn. The following spring when this land is being prepared for cotton the vetch seed will be turned to the surface. In September when cultivation is finished, these seed will germinate. After the first year the vetch may be harvested for hay as soon as a few seed have matured. The seed shatter out easily and will leave plenty of seed on the land to furnish volunteer vetch every other year. Such a method will furnish three crops in two years, and will greatly assist in building up the soil. Hairy Vetch is hardy and if it gets an early start will stand our coldest winters. Vetch is the surest winter legume we have found. The cotton stalks should not be cut, as they furnish support for the vines, which is very desirable.

In the non-lime soils vetch is a little hard to get established. A small quantity of stable manure works like magic. Two tons of crushed limestone per acre will more than double the yield.

TABLE No. 6—Lime and Fertilizer Test with Cow-Peas.

Plots 1-20 acre each. Planted May 27, 1915.

Peas were picked by hand before the vines were cut. Some of the leaves were lost before the vines were cut. Vines were cut October 15.

Rows 30 inches apart, with one row skipped between plots.

Variety of peas used was Brown Whipporwill.

No.	VARIETY OF FERTILIZER.	Bushels peas per acre	Pounds of hay per acre
1	No Fertilizer	11.6	2380
2	500 lbs. Air slaked lime	16.9	3480
3	200 lbs. Basic slag	16.6	3200
4	200 lbs. Phosphate rock	18.8	2380
5	200 lbs. Acid phosphate	20	2680
6	No Fertilizer	15.3	2000
7	500 lbs. Crushed lime stone	18.6	2560
8	2000 lbs. Air slaked lime	23.6	3040
9	500 lbs. Rotten lime stone (lump) not crushed fine	17.7	2720
	A second planting made June 1915, with same size plots as above. No peas were picked from this planting.		
1	4000 lbs. Uncrushed rotten lime stone		4280
2	No lime		3740
3	Crushed lime stone rock		4740

TABLE No. 7—Lime.

Soil—Valley land of ordinary fertility.

Plots—1-20 acre each, 24x92 feet.

Lime—Applied to land before seeding in 1912.

Planted—September 15, 1912. The 1916 planting of oats and vetch did not germinate until very late and was winter killed.

Crops Planted—Oats and vetch mixed, at the rate of two bushels per acre. The 1912 planting of oats and vetch was harvested the latter part of May, the land turned and seeded to corn.

The 1916 planting of oats and vetch that was killed was followed with corn planted May 10, 1917.

Number	KIND OF LIME.	Yield in Pounds of oats and vetch hay 1912	Yield of corn in bushels 1912	Yield of corn in bushels 1917
1	No Lime	2140 lbs.	18.3	28.4
2	4000 lbs. Crushed lime stone	2860 lbs.	24.7	63.8
3	2000 Air slaked lime	3560 lbs.	29.7	55.5
4	No Lime	2560 lbs.	21.4	38.8

Remarks—Lime is not a fertilizer. It sweetens the soil and encourages the growth of bacteria that forms the nodules on the roots of leguminous plants, thus enabling the plant to take nitrogen from the air. It also assists in floculating the soil and liberating some of the mineral plant foods.

Conclusions—It appears that the air slaked lime was more active at the start, and that the crushed stone gave better results later. In the limed plots the vetch settled down on the ground more than on the unlimed plots, as the growth was more than double, and in harvesting the crop much more vetch was left on the soil. This, to a large extent, accounts for the increased yields of the plots that were limed. More of the legume was turned under each year.

Alfalfa.

Alfalfa will grow on almost any character of soil in this section of the State, if four or five tons of crushed lime stone is applied per acre. Only fertile, well drained soils will give satisfactory results. Fall planting is more satisfactory if the season for planting is favorable; if not, the planting should be made in the spring. Twenty-five pounds of the best seed that can be had should be planted per acre. The soil should be inoculated (see method under crimson clover) by using soil from an alfalfa field. If fall planting is to be made, the soil should be prepared about the first of August, limed and fertilized if desired, harrowed and rolled, with harrow following the roller. A firm seed bed is necessary and the soil should not be turned again before planting which should be made after a good rain in the latter part of September. The disk and smoothing harrow should be used on the land after preparation is made as soon as possible after each rain to preserve the moisture and destroy the weeds and grass. Only the section harrow will be necessary for covering the seed when planted.

Alfalfa is one of the most profitable legumes that can be grown. It will furnish a most excellent hog pasture if mowed every thirty days during the summer, and not grazed too closely by the hogs. Very close grazing will destroy the plant, No farmer would make a mistake to plant a small acreage, say about one acre, for the hogs and poultry of his farm.

A variety test is now being made to ascertain the variety best adapted to this section. Seven varieties are employed in this test. The planting was made last spring and but little data has been secured at this writing. The extremely hot weather the past season was unfavorable for the growth of alfalfa, and favorable for the growth of weeds and grass.

DAIRYING.

This section of the State is especially adapted to dairying. There is a large amount of waste land on almost every farm, that, if utilized for pasture for good dairy cattle, could, in all probability, be made more profitable than if used in any other kind of farming. Marketing facilities are good; creameries and milk markets are within forty miles in any direction.

These lands are especially adapted to the growth of grasses and forage crops.

Labor is plentiful and cotton cheap.

Legumes grown to keep up soil fertility can be fed to the dairy cow and the manure returned to the farm; the dairy cow being used to market all surplus feed grown on the farm.

Winter cover crops that should be grown on all cultivated land in the hill section of the State can be grazed in the fall and spring to an advantage.

On account of mild winters, inexpensive barns can be used.

The grazing seasons are longer and greater tonnage of forage, on fertile land, can be grown than are now grown in the more favored dairy sections of the United States

The best dairy market of the country at present is in the South. Dairying furnishes employment the whole year around.

Then why not more dairy farms in this section? The South has been too loyal to "King Cotton," and her loyalty has resulted in poor lands, and, of a necessity, a poor people.

The Station dairy was installed in August, 1909, with cows selected from this county. The dairy has been used as a demonstration purely, and not for experimental purposes. The Central Station dairy is engaged in such work.

For four years, as reported in Bulletin No. 165, an average of $110.00 gross, and $65.00 net was made for every cow in the dairy. These results were obtained before the war and were more than doubled during the abnormally high prices that have prevailed the last few years. Such prices cannot be expected to continue for an extended period of time.

Three money crops are considered the maximum number for profitable farming. This does not include crops to be utilized on the farm. Cotton growing should be one farm industry, and we think dairying and sweet potato growing could easily be made two other profitable ones where marketing facilities are good. Four things are necessary for profitable dairying: good cows, plenty of the right kind of feed, a good market, and the man. We are inclined to think the last named should be first—"the Man." A good man will get the cows, and grow the feed, and find the market.

An inexperienced man should grow into the dairy business. Start with the cows on hand, and weed out and secure more profitable cows as means will justify.

It will be just as hard to make a success dairying, and buying all the feed, as it is to make a success growing cotton and buying all the supplies for the farm.

The Station averages about twenty cows in the milk barn at all times. One darkey uses the milking machine and strips all the cows, cleans the barn and milking utensils; in fact, does all the work of the dairy. The dairy does not in any way interfere with farm work, but on the other hand, furnishes a market on the farm for all surplus food and keeps up the fertility on the farm.

More cotton and sweet potatoes could be grown on a dairy farm properly managed than the same farm would grow without the dairy. In fact, the growing of livestock is one of the essentials of successful agriculture, and the dairy cow should head the list in this section.