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Report, Raymond Branch Experiment Station 1925

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Report Raymond Branch Experiment Station 1925

By

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Report of the Work at the Raymond Branch Experiment Station

By H. F. Wallace
and
C. B. Anders

INTRODUCTION

This report contains a summary of the work conducted on the Raymond Branch Experiment Station for the year of 1925. Two other publications cover the results obtained by this Station since its establishment by an act of the Legislature of 1920. These publications may be secured from the Mississippi Experiment Station, A. & M. College, Mississippi, upon request.

Our results this past year were derived from experiments expressly conducted to determine the kinds and quantities of fertilizers, varieties and cultural methods of cotton, corn, legume and truck crops best suited for the southern section of the Brown Loam soil area of Mississippi. Very unfortunately a change was made in the management of this Station between planting and the harvest and it will be practically impossible to go into detail as to the cultural methods used in producing the 1925 crop.

The Divine will was that Mississippi be blessed with a bountiful cotton crop this past season. Dry growing periods practically controlled the boll weevil in 1924 and when it met the same conditions in 1925, its ranks were greatly depleted, but not to the extent to make us believe that the 1926 crop will be immune to its ravages.

Man's efforts in producing the 1925 harvest were justly rewarded. All credit to the success of the past season's work on this Station is due the former director, Mr. C. B. Anders and his able assistant, Mr. J. C. Peyton.

COTTON

The year of 1925 has been a wonderful cotton year. Mississippi has produced the largest cotton crop in her history. The average yield per acre this year in Mississippi is higher than any cotton growing state except three irrigated states of the west. Cotton has been made more cheaply this year due to the dry growing season and the absence of the boll weevil.

Varieties—A table follows in which twenty-five leading varieties of cotton are listed. Taking into consideration the work of the past year and the data of preceding years, we recommend for good valley land, Miss. Sta. Trice, Lone Star 65, Delfos, D & P L No. 4, Cleveland

54, and Miller; for hill land, Miss. Sta. Trice, Willis, Cleveland 54, Acala, and Miller.

Fertilizers—It is interesting to note in table II that every fertilizer combination used produced a profit. These fertilizers were home mixed and put down at the rate of from 600 to 2400 pounds of a corresponding commercial fertilizer per acre in three different localities. One of the cooperative tests was put on the farm of Mr. J. W. Hayes at Harperville, in Scott County. Mr. A. E. Terry, County Agent, as well as Mr. Hayes contributed every effort to the success of this test. The other was on the farm of Mr. George W. Harris of Rankin County and excellent cooperation was obtained.

These tests, as well as the test on the Station, were conducted in three series each, except the Scott County plots which were in two series. The table contains the results in condensed form.

In making recommendations, we can see a little advantage in increasing the quantity of nitrogen. A fertilizer for general use might be suggested as follows: 300 pounds acid phosphate, 200 pounds nitrate of soda, and 100 pounds of kainit per acre. One hundred pounds of nitrate of soda per acre used as a side dressing after chopping will probably prove beneficial when the boll weevil is present.

TABLE I—VARIETY TEST WITH COTTON—1925—RAYMOND STATION

Variety	Pounds per acre		Lint Data			Total dollars per acre	Rank in value
	Seed	Lint	Per-centage	Length	Cents per lb.		
Trice, Miss. Sta.	1641.0	696.6	29.8	1 1-16	20.83	177.92	14
Trice, Burdette	1529.8	655.6	30.0	1 1-16 f	21.25	169.91	20
Cleveland, Wan.	1436.5	854.5	37.3	7-8	18.00	182.54	9
Cleveland, Pied.	1586.3	770.7	32.7	15-16	18.53	174.54	15
Cleveland, Coker	1442.6	794.0	35.5	15-16 f	18.83	181.24	12
Cleveland 54	1603.6	811.4	33.6	1 f	19.75	192.32	8
Half & Half	1129.5	838.3	42.6	7-8	18.00	173.48	17
Cook 1010	1164.2	741.2	38.9	7-8 f	18.33	159.15	25
Willis	1535.2	739.2	32.5	1	19.33	173.59	16
Miller	1488.7	729.9	32.9	1 1-16	20.83	181.81	10
Acala	1328.4	702.8	34.6	1 1-16	20.83	172.96	19
Mex. Big Boll	1380.1	682.9	33.1	1 1-16	20.83	169.85	21
D. & P. L. No. 4	1456.1	815.5	35.9	1 1-16	20.83	198.99	6
Lone Star 65	1433.7	706.1	33.0	1 1-8 f	23.67	195.81	7
Salsbury	1448.8	678.6	31.9	1 1-16f	21.25	173.18	18
Webber, Deltatype	1450.9	639.7	30.6	1 5-16	32.00	233.72	1
Delfos 631	1535.4	709.4	31.6	1 3-16 f	26.42	218.13	3
Delfos 911	1457.6	698.6	32.4	1 3-16	25.33	206.11	5
Delfos 6102	1481.7	697.3	32.0	1 3-16	25.33	206.26	4
D. & P. L. No. 5	1377.2	654.0	32.2	1 1-4	28.33	218.82	2
Express, Light.	1416.3	604.1	29.9	1 3-16	25.33	181.34	11
Express, 432	1226.0	598.4	32.8	1 1-8 f	23.67	166.16	22
Gary	1340.7	777.3	36.7	1 f	19.75	180.33	13
Mahon's Half & Half	1080.4	776.0	41.8	7-8	18.00	161.29	24
Titche's Imp.	1399.5	756.9	35.1	7-8	18.00	164.23	23

TABLE II—AVERAGE THREE COTTON FERTILIZER TESTS, RAYMOND STATION, 1925.

Pounds of Material Applied to the Acre			Formula	Pounds Seed Cotton Test					Dollars per acre		
Acid Phosphate	Nitrate of soda	Sulphate of Potash	as Mixed Fertilizer	Station	J. W. Hayes	G. C. Harris	Average	Increase	Value	Cost fertilizer	Net Gain
No fertilizer				1465.0	898.6	486.4	950.0				
300	150	100	8-4-8	1838.6	1402.3	536.7	1259.2	309.2	21.64	9.27	12.37
300	150	75	8-4-6	1719.6	1185.4	506.2	1137.1	187.1	13.10	8.65	4.45
300	150	50	8-4-4	1689.3	1234.4	618.1	1180.6	230.6	16.14	8.02	8.12
No fertilizer				1465.0	898.6	486.4	950.0				
300	150	25	8-4-2	1776.2	1208.0	682.0	1222.1	272.1	19.05	7.40	11.65
300	150	None	8-4-0	1816.0	975.7	661.8	1151.2	201.2	14.08	6.77	7.31
300	300	50	8-8-4	1958.4	1164.0	1042.0	1388.1	438.1	30.67	12.14	18.53
No fertilizer				1465.0	898.6	486.4	950.0				
300	225	50	8-6-4	1928.8	1193.2	883.2	1335.1	385.1	26.96	10.08	16.88
225	150	50	6-4-4	1974.8	1071.9	851.6	1299.4	349.4	24.46	7.36	17.10
150	150	50	4-4-4	1767.6	1337.4	875.0	1326.7	376.7	26.37	6.70	19.67
No fertilizer				1465.0	898.6	486.4	950.0				
600	300	100	8-4-4	2102.6	1329.3	1099.1	1510.3	560.3	39.22	16.04	23.18
900	450	150	8-4-4	2292.7	1304.3	1064.7	1553.9	603.9	42.27	24.06	18.21
1200	600	200	8-4-4	2205.5	1552.8	944.6	1567.6	617.6	43.23	32.08	11.15
No fertilizer				1465.0	898.6	486.4	950.0				

Note:— The materials applied to the last three fertilized plots supply as much plant food to the acre as would be supplied by 1200, 1800, and 2400 pounds respectively, of an 8-4-4 mixed fertilizer. All other treatments were based on 600 pounds of mixed fertilizer of the formulas indicated.

TABLE III—NITROGEN SOURCES TEST—1925

Pounds of material applied to the acre	Pounds seed cotton per acre		Percent increase	Dollars Increase in value at 7 cts.
	Yield	Increase		
No Fertilizer	1482.5			
150 Nitrate soda	1801.9	319.4	21.54	22.36
112.5 Ammonium sulphate	1753.1	270.6	18.25	18.94
88 Ammonium nitrate	1845.1	362.6	24.46	25.38
No fertilizer	1482.5			
105 Calcium cyanamid	1827.5	345.0	23.27	24.15
173 Calcium nitrate	1804.5	322.0	21.72	22.54
48.9 Urea	1847.5	365.0	24.62	25.55
No fertilizer	1482.5			

Note: A general application of 300 pounds of acid phosphate and 150 pounds of sulphate of potash per acre was made to each plot, including the checks. Each nitrogen carrier was equivalent to 200 pounds of nitrate of soda, supplying 22.5 pounds of available nitrogen per acre.

Remarks—This is the first year that this test has been conducted at this station so we are unable to make any recommendations. The primary object of this test is to determine the cheapest nitrogenous fertilizer for the cotton grower.

Conclusions—One year's results are not considered final in experimental work. The table is published for your observation.

TABLE IV—SPACING TEST WITH COTTON—1925

Number of stalks		Yield in seed cotton per acre	Rank in production
Plot	Foot		
552	1.08	1736.6	5
902	1.77	1817.1	4
1146	2.25	1906.2	2
1445	2.83	1924.7	1
1511	2.96	1861.7	3

Remarks—The above test was planted in three series of two rows each on May 14, 1925. On March 5, 1925, a mixture of 300 pounds of acid phosphate, 200 pounds of nitrate of soda, and 200 pounds of kainit was applied per acre. Lone Star 65 cotton was used.

It was the intention to leave one, two, three, four, and five stalks respectively, per foot in this test, but an actual count reveals the exact number of stalks left.

Conclusions—From the above table and our results in the past, we do not hesitate to recommend three to five stalks per foot on hill land and two to three stalks per foot on valley land using three foot rows on the hill land and 3½ foot rows on the valley land. During an extreme dry year the best results will be secured from the medium of these recommendations, but an average year it appears they will hold good.

TIME OF APPLICATION OF FERTILIZER WITH COTTON—1925

It seems that some doubt has arisen in the minds of some as to the proper time to apply the various fertilizers. A test was conducted on this station the past year to determine the time of application. Extreme dry weather was a great hindrance to the late applications, but where acid phosphate was held out and applied in the sweep-furrow June 18 and the nitrogen and potash applied before planting, a difference of $28.64 in profit per acre was had in favor of applying the complete fertilizer before planting. Where all the fertilizer was applied at dirting, the profit was decreased $4.29.

Probably due to the dry season, these results are not pronounced as they might have been a normal year. Our results in the past indicate better yields when all fertilizer is applied before planting, except in cases of heavy infestation of coco, Bermuda or Johnson grass and should this situation occur it might be well to apply the nitrogen after the chopping has been completed. It is probable that additional yields might be obtained when from one to two hundred pounds of an available nitrogenous fertilizer per acre is used as a side dressing in addition to the amount put down at planting.

Lone Star 65 cotton was planted in this test, May 14, 1925. Three series were used.

CORN

During the past year quite a bit of attention was given to corn. Various tests including a variety test of seventeen leading varieties, a general fertilizer test, and a source of nitrogen test were conducted. The results of the variety test are given in table V.

In the general fertilizer test, an increase in nitrogen to 6 per cent gave the best results. Some potash seems to be beneficial. To get the best results from the nitrogen it will also be necessary to use some phosphorus. Where corn follows a trucking crop using heavy quantities of phosphorus and potash, it is doubtful as to whether anything but nitrogen is needed. In all cases in this section corn should be planted on the best land on the farm.

A suggested general fertilizer for corn in this section is 100 pounds of acid phosphate, 150 to 200 pounds of nitrate of soda, and about 50 pounds of kainit to the acre.

The source of nitrogen test has not been conducted long enough to make recommendations but lime nitrate gave promising results during the past year.

TABLE V—CORN VARIETY TEST—1925

Variety	Yield bus. shelled corn per acre	Per cent of grain	Rank	Average 1922 to 1925	Average in rank
Mosby, Station	40.66	79.0	5	27.69	8
Mosby, Delta	39.10	78.1	8	28.46	5
Mosby, Lee	38.04	80.0	11	——	——
Mosby, Suttle	37.29	81.4	13	——	——
Cocke's Prol., Sta.	40.86	77.7	4	29.36	3
Cocke's Prol., Delta	39.77	78.4	7	27.95	7
Hastings	37.94	75.7	12	26.56	9
Delta Prolific	36.93	76.2	14	26.39	10
Johnson Prolific	38.25	77.6	10	——	——
Laguna	41.49	74.7	2	31.66	1
Mexican June	38.81	75.8	9	——	——
Paymaster	40.96	81.2	3	28.18	6
Ellis	40.31	76.8	6	28.63	4
Yellow Dent, Ferg.	36.05	77.6	15	——	——
Yellow Dent, Sta.	35.07	76.9	16	——	——
Golden Dent	32.36	76.7	17	——	——
Whatley Prol.	43.57	78.3	1	30.37	2

Remarks—This test is conducted each year to determine the most paying variety of corn. The first planting, April 18, 1925, failed to produce a good stand, owing to dry weather. It was replanted May 16, 1925, in checks three feet apart on three and one-half foot rows. A good stand was secured. Two hundred pounds of acid phosphate mixed with one hundred pounds of nitrate of soda was applied per acre. There were six series.

Conclusions—It would appear from past results and the above table that we are justified in recommending for general planting the following varieties: Whatley Prolific, Mosby, Cocke's Prolific, Hastings, Laguna, and Ellis. Our general plantings for feeding purposes on the Station are made to Whatley Prolific and Mosby.

SOYBEANS

A test was conducted to determine the amount of hay, as well as the amount of grain that the different varieties of soybeans were capable of yielding per acre. Included in this test were the Wilson, Virginia, Laredo, Mammoth Yellow, Biloxi, and Otootan soybeans. The Biloxi and Otootan beans did not mature until October 12 and all results pertaining to them were destroyed by the fall rains. Rains prevented the determination of the grain percentages in each case.

The fertilizer used in this test was a mixture of 300 pounds acid phosphate, 200 pounds nitrate of soda and 200 pounds kainit per acre. The beans were planted on three and one-half foot rows, in hills twelve inches apart, May 16, 1925. It is hardly worth while to mention the extreme dry season that followed. Each plot was 1-24 of an acre.

On September 10, the Wilson and Virginia had matured suffi-

ciently to cut for hay and produced a yield of 1.72 and 1.71 tons of hay per acre respectively. The Laredo and Mammoth Yellow were cut September 23 with corresponding yields of 3.05 and 2.57 tons of hay per acre. While the Wilson and Virginia mature two weeks earlier than the Laredo, we get nearly twice as much hay from the latter. The Otootan is a very desirable bean and will produce as much or probably more hay per acre than the Laredo, but owing to its late maturity, which is three or four weeks later, the harvest will come at a time when cotton is being picked. The Mammoth Yellow and the Biloxi are rank growing beans with very coarse main stems that stock will get very little benefit from unless ground. It has been our pleasure to see the Biloxi bean attain a height of six feet on medium brown loam soil. Soybeans should be planted in every row of corn grown in Mississippi.

TOMATOES

The importance of the tomato to the trucking section has been taken into consideration at this Station. Various tests have been conducted as to varieties, sources of nitrogen, sources of potash, and a test to determine the best formulas to use in producing tomatoes. The most oustanding result of the formula test was that a two year average of 2000 pounds of a 10-3-3 fertilizer per acre produced more tomatoes than any other formula used. This average for two years was 14,773 pounds per acre and 45.9 per cent of this were shippers.

The other tests mentioned follow in table form. A study of these tables will reveal the information contained therein.

TABLE VI—TOMATO VARIETY TEST—1925

Variety	Yield in pounds per acre		Percentage picked early		Percent of total that	Average size of
	Total	Shipping tomatoes	Total	Shipping tomatoes	were shippers	shippers lbs.
Gulf States	10317	4668	75.0	77.7	45.2	.259
Richards	12326	5125	76.0	78.8	41.6	.290
Globe	17489	8385	74.2	76.8	47.7	.294
Detroit	11139	5276	80.2	86.4	47.5	.300
Marglobe	16443	9027	73.6	78.1	54.9	.307
Marvel	16644	9009	84.4	89.0	53.9	.292

Remarks—Seed were planted in hot bed January 24, 1925, moved to cold frame February 18 and 19, and sprayed with 3-3-50 Bordeaux for early blight on March 26. A spray of 1-50 arsenate of lead was also applied at this time. The plants were set in the field March 30. This test was conducted in five series.

Conclusions—The data in the above table indicate that the Marvel and Marglobe are about the best varieties to plant, especially on wilt infested soil. The Globe is also a heavy producer and can be safely grown on soils not infected with wilt. Results in the past show the Gulf States to be a leader in high yields.

TABLE VII—TOMATO TOPPING TEST—1925

Method of topping	Yield in pounds per acre		Percentage picked early		Percent of total that	Average size of
	Total	Shipping tomatoes	Total	Shipping tomatoes	were shippers	shippers lbs.
Topped 1st cluster	6438	2908	62.9	62.4	45.2	.288
Topped 2nd cluster	10458	5109	70.6	75.3	48.9	.282
Topped 3rd cluster and staked	13381	7990	71.8	81.5	59.7	.283
Topped 4th cluster and staked	19841	9207	70.1	74.8	46.4	.307

Remarks—The above constitutes the only data we have along this line. Topping the fourth cluster and staking the plant seems to increase the average size of the shipping tomatoes. These data were obtained from a test on five series.

TABLE VIII—AVERAGE RESULTS OF NITROGEN SOURCES TEST WITH TOMATOES—1924 and 1925

Source of nitrogen	Pounds per acre		Percent shippers	Percent picked early		Total value dollars
	Total	Shippers		Total	Shippers	
1500 pounds of an 8-4-3 per acre						
Nitrate of soda	9614.5	4198.5	44.9	29.1	41.8	265.45
Ammonium sulphate	9659.0	4247.0	43.2	37.0	51.7	268.35
Combination	9503.0	4190.5	43.3	34.8	47.4	264.71
Urea	9725.0	4732.0	48.7	35.9	47.2	296.40
Cottonseed meal	10752.0	4881.0	44.3	33.4	45.2	307.54
2000 pounds of an 8-4-3 per acre						
Nitrate of soda	11054.5	4603.0	42.1	33.5	47.0	292.31
Ammonium sulphate	10318.0	4536.0	45.1	36.4	48.7	286.62
Combination	12899.0	5607.0	44.6	34.6	47.2	354.65
Urea	11155.0	5360.0	48.1	33.2	44.8	336.09
Cottonseed meal	11923.5	5377.0	44.4	31.7	44.4	338.99

Remarks—This test was conducted in two series. Phosphorus was derived from acid phosphate and potash from sulphate of potash. The nitrogen was derived from the sources indicated except in the case of a combination and then equal pounds of nitrogen were derived from nitrate of soda, sulphate of ammonia, and cottonseed meal. A stand was secured in the field, April 1, 1925. An 8-4-3 formula is used for all mixtures.

TABLE IX—AVERAGE RESULTS OF POTASH TESTS WITH TOMATOES, 1924 and 1925

Fertilizer formula	Pounds per acre		Percent shippers	Percent picked early		Dollars per acre		
	Total	Shippers		Total	Shippers	Total value	Cost of fertilizer	Net gain
		1000 pounds per acre						
8-4-0	14437	6135	42.5	30.2	43.8	388.86	10.44	378.42
8-4-3	14952	6249	41.8	34.9	47.6	396.70	12.00	384.70
8-4-6	16041	6792	42.3	34.9	49.1	430.64	13.56	417.08
		1500 pounds per acre						
8-4-0	15133	6207	41.0	35.7	48.7	394.74	15.66	379.08
8-4-3	14086	5913	42.0	32.4	42.5	375.21	18.00	357.21
8-4-6	14239	7866	55.2	28.7	41.3	487.89	20.34	467.55
		2000 pounds per acre						
8-4-0	15103	6333	41.9	33.0	45.2	401.91	20.88	381.03
8-4-3	14642	6566	44.8	35.2	46.7	414.15	24.00	390.15
8-4-6	14924	6631	44.4	31.5	42.3	418.59	27.12	391.47

Remarks—Planted in hot bed January 24, 1925. Moved to cold frame February 18 and 19. Sprayed with 3-3-50 Bordeaux mixture for early blight and 1-50 arsenate of lead for bugs on March 26. Set in field March 30 and a light frost on the morning of March 31 killed seventy per cent of the plants. Reset with plants from Hinds County Agricultural High School April 1, 1925.

In the fertilizer, all phosphorus was derived from acid phosphate; nitrogen from equal parts of nitrogen from nitrate of soda, ammonium sulphate and cottonseed meal; and potash from sulphate of potash.

Conclusions—It would appear from these results and data accumulated in the past that some potash is necessary. We feel absolutely safe in recommending at least three percent in a fertilizer formula.

TABLE X—AVERAGE RESULTS OF ENGLISH PEA FERTILIZER TEST 1924 and 1925

Fertilizer formula	Yield pounds per acre	Dollars per acre		
		Value at 5c	Cost of fertilizer	Net gain
	1000 pounds per acre			
10-3-3	2106	105.30	11.59	93.71
8-3-3	2250	112.50	10.49	102.01
8-4-3	2323	116.15	12.00	104.15
	1500 pounds per acre			
10-3-3	2207	110.35	17.39	92.96
8-3-3	2152	107.60	15.74	91.86
8-4-3	2393	119.65	18.00	101.65

TABLE XI—AVERAGE RESULTS OF NITROGEN SOURCES TEST WITH ENGLISH PEAS—1924 and 1925

Rate per acre of 8-4-3	Yield using nitrate soda	Yield using sulphate
1000 pounds	2240	2132
1500 pounds	2233	1941

Conclusions—From the above tables the average for the past two years indicates that 1000 pounds per acre of an 8-4-3 formula, using

nitrate of soda as the source of nitrogen, gives the best results with English peas.

In the first table the nitrogen for each formula was derived in equal parts of nitrogen from nitrate of soda, ammonium sulphate, and cottonseed meal. In 1925, for this table, the Gradis pea was used and planted March 5, while the Alaska was used and planted March 8 in the lower table. This past year the yield was cut very low on account of no rain from date of planting until the vines were dead, April 9, 1925.

TABLE XII—AVERAGE RESULTS OF SNAP BEAN FERTILIZER TESTS—1924 and 1925

Fertilizer formula	Yield in lbs. per acre	Value at 5c	Cost of Fertilizer	Net Gain
	1000 pounds per acre			
10-3-3	4374	218.70	11.59	207.11
8-3-3	3833	191.65	10.49	181.16
8-4-3	3620	181.00	12.00	169.00
	1500 pounds per acre			
10-3-3	4259	212.95	17.39	195.56
8-3-3	3877	193.85	15.74	178.11
8-4-3	4569	228.45	18.00	210.45

TABLE XIII—AVERAGE RESULTS OF NITROGEN SOURCES TESTS WITH SNAP BEANS—1924 and 1925

Rate per acre of 8-4-3	Yield using nitrate soda	Yield using ammonium sulphate
1000 pounds	3833	4083
1500 pounds	4959	5126

Remarks—The above tables show results from tests conducted to determine the amount of the best fertilizer as well as the source of nitrogen for these fertilizers to use in the growing of snap or green beans. Where the source of nitrogen is not designated, it was derived from equal pounds of nitrogen from nitrate of soda, ammonium sulphate, and cottonseed meal. This test was planted to Red Valentine beans March 5, 1925 and no rain fell until the vines were blooming, May 9, 1925. The drouth was no doubt responsible for low yields.

TABLE XIV—CABBAGE FERTILIZER TEST—1925

Amount of fertilizer used per acre	Average size in lbs.	Yield in pounds per acre	Value at 1c	Increase over check
No fertilizer	1.26	6325	$ 63.25	
1000 lbs. of a 10-4-4	1.71	19601	196.01	$132.76
1500 lbs. of a 10-4-4	2.13	26737	267.37	204.12
2000 lbs. of a 10-4-4	2.31	27993	279.93	216.68

Remarks—This test was conducted to determine the amount of fertilizer per acre that would produce the highest yield of the largest size cabbage. A 10-4-4 fertilizer was used with phosphorus derived from acid phosphate, nitrogen from equal pounds in nitrate of

soda and ammonium sulphate, while the potash was derived from sulphate of potash. Cabbage plants were set March 4, 1925. This test was conducted in three series.

Conclusions—It would appear that from 1500 to 2000 pounds per acre of a 10-4-4 fertilizer made from the ingredients listed above would make an ideal fertilizer for cabbage in this section. Conclusions cannot be based on one year's results however.

Several tests of various natures have been conducted on and around the Station that will be of especial interest to the trucking section. Mr. H. H. Wedgeworth of the State Plant Board, cooperating with the Station, had charge of this work.

A part of Mr. Wedgeworth's report follows:

POISONED-BAIT FOR THE CONTROL OF CUTWORMS

"During the spring of 1925 about 15% of the tomato plants were cut by cutworms in the Crystal Springs trucking section, and many other crops were also attacked. In many fields where no control measures were taken losses of from 75 to 90% were sustained. The writer's attention was called to one field where the grower used over 14,000 plants in attempting to secure a stand of tomatoes on one acre that would require about 5,000 plants to give a perfect stand. The severe injuries usually occurred on land that had formerly been in sod or in poorly cultivated field. The cutworm that caused most of the damage is known as the Dingy Cutworm, *Feltia ducens*, according to Mr. H. W. Allen who has identified many specimens collected in this part of the State.

"Poisoned-bait has been recommended for a number of years for the control of cutworms but the practice has not been generally accepted in this State. The main reason for the bait not being more generally used probably lies in the fact that no carefully controlled experiments have been conducted to test the effectiveness of poisoned-bait on the Dingy Cutworm in this State. In view of this fact some preliminary experiments were conducted during the Spring of 1925 at the Raymond Branch Experiment Station to test the value of poisoned-bait for the control of cutworms attacking tomatoes. The bait used in these experiments was made according to the following formula:

Shorts, wheat	5 lbs.	Molasses	½ pint
Paris Green	1½ ozs.	Water	1 gal.

The shorts and Paris green were thoroughly mixed while dry; and then wet with the mixture of molasses and water until damp enough to be of such a consistency that it would fall in small lumps, about the size of oat grains, when sown.

"1. Experiments were conducted to determine the value of poisoned-bait for the control of cutworms.

"2. In the experiment with cages free of vegetation 88% of the

cutworms were killed where poisoned-bait was applied broadcast and 9% died in the checks (probably from injuries obtained in handling).

"3. In the cage experiment where young tomato plants were growing 7% of the plants were cut in the poisoned cages compared with 96.88% cut in the check cages.

"4. In a simple field test poisoned-bait was applied in small quantities near each plant and one row was left as a check. Less than one per cent of the plants were cut on the treated rows compared with 23.65% in the check.

VALUE OF CERTIFIED IRISH POTATO SEED IN MISSISSIPPI

"During recent years the need of Irish potato seed comparatively free of disease has been felt by several of the Northern and Western states. Through the Agricultural Experiment Station and Colleges of these states, the potato growers have developed or selected this type of seed which are known as certified seed. This has been accomplished through the strict requirements for eligibility for certification which requires two or more field inspections and one or more bin or storage inspections. Seed produced under these requirements have met with great success in some of the Southern states, especially in Louisiana whose experiment station in cooperation with the United States Department of Agriculture began testing the certified seed produced by Northern and Western states some five years ago. The extensive use as well as the relative value under Louisiana conditions may be seen by the amount of seed shipped into the state, which was 22 cars in 1922, 85 cars in 1923, and 255 cars in 1924. It is to be regretted that interests in Mississippi have not purchased a single car lot of certified seed during this period so far as the writer has been able to learn. A few smaller shipments have reached the state and have proven to be satisfactory.

"From the results obtained from other Southern states, recommendations of certified seed have been made during the past three or four years but the use has not been generally adopted in this State. In view of the above facts an experiment was conducted on the Raymond Branch Experiment Station to test the value of the certified potato seed under Mississippi conditions.

"One lot of certified seed was secured from each of Nebraska and Wisconson, and one lot of field run stock (uncertified) from each of seedsmen of Jackson and Vicksburg. In cutting these lots of seed, care was taken to have the seed pieces the same size, in order to eliminate differences that might arise from seed pieces of different weights. The soil used in this experiment was of a medium heavy sandy loam type. One thousand pounds of a 10-4-4 (P-N-K) fertilizer per acre was applied in the drill at the time of planting, March 7. The rows were three and one-half feet wide and 124½ feet long, (1-100 part of an acre). The potatoes were planted one foot apart (checks) in the

drill and 1½ inches deep. The different lots were planted in the order given in table 1, and each was repeated three time.

"On May 1 readings were made to determine the amount of leaf diseases in the different lots. Measurements were also made of the heights of the plants in order to illustrate the relative vigorousness of the plants from each lot of seed. At the time of the reading of the vine diseases only a trace of spindling-tuber could be found and the amount was not recorded. After harvesting the potatoes, however, a somewhat larger percentage of this disease was found in the tubers. The predominating disease and very likely the most important limiting factor in potato production in Mississippi was Mosaic. The amount of this disease for the various lots of seed are given in table 1 and a brief description of the disease is given in the following paragraph.

"Plants infected with Mosaic show a mottling, puckering or corrugating effect upon the leaflets when grown in cool or cloudy parts of the season. The diseased leaflets are mottled with patches of light green or yellowish green spots. When such leaves are held between the eye and the light, the varying degrees of color densities may be observed. This mottling and puckering may be masked in diseased plants grown in the bright sunlight or in high temperatures but are very striking on those plants partly shaded. For the same reasons, Mosaic may not be visible on the upper leaves but may be distinct on the lower leaves that were developed during the cooler and cloudy parts of the season. Although environmental conditions play an important role in the appearance of the symptoms of the disease, they do not seem to have much effect upon the amount or severity of the disease. Badly affected plants may be dwarfed, as shown in table XV. The yield decreased from a trace to fifty or seventy-five per cent, depending upon the amount and severity of the disease, but the size and appearance of the tubers may be as perfect as those from healthy plants, thus making tuber selection for disease-free seed impossible.

"The cause of the disease has not been determined but it is known to be infectious, transmitted by bruising the diseased leaves and then rubbing the sap into the healthy plant, or by certain aphids that have fed upon diseased plants and transferred to healthy plants and possibly by some other insects. Tubers produced on infected plants are usually infected and carry the inoculum over to another season. Certain aphids may also carry the inoculum over the winter to the following season.

"On June 1 the potatoes were harvested and sorted into the various classes. These results are given in table XV. The relatively large yield of tubers from one and a half to two inches in diameter is undoubtedly due to the extended drought in April. When the rains finally came the potatoes set a "second crop" which did not reach full size before the plants matured.

TABLE XV—RELATION OF CERTIFIED AND UNCERTIFIED IRISH POTATO SEED ON PER CENT OF GERMINATION, AVERAGE HEIGHT OF PLANTS, PER CENT OF MOSAIC PLANTS AND YIELD PER ACRE

Kind and source of seed	Percent of germination	Average height of plant inches	Mosaic plants %	Bushels per acre			
				Diameter of tubers inches			
				2 or more	1½ to 2	Culls	Total
Uncertified Lot No. 1 Vicksburg, Miss.	90.56	10.01	68.07	36.81	58.98	14.91	110.70
Certified, Wisconsin Eagle River, Wis.	99.72	13.18	2.78	83.84	86.11	16.42	186.37
Uncertified Lot No. 2 Jackson, Miss.	93.61	9.74	32.24	33.34	80.14	22.85	136.33
Certified, Nebraska Alliance, Nebr.	99.17	14.49	2.52	91.51	96.88	16.23	204.62

SUMMARY

"1. Two lots of certified Irish potato seed were tested in comparison to two lots of uncertified Irish potato seed.

"2. Certified Nebraska gave the highest yield and was closely followed by certified Wisconsin.

"3. Both uncertified lots of seed had a high percentage of Mosaic, lot No. 1 having the highest percentage of disease yielded the least amount of tubers.

"4. Data given in table XV indicate that the higher the percentage of Mosaic the smaller the average size of the plants, thus showing that the disease tends to dwarf the plants.

"5. The certified lots of seed gave a much better stand of potatoes which is probably due to the fact that they were from plants that were sprayed for disease and contained less late-blight and possible other rots."

A NON-FERMENTING METHOD OF SAVING TOMATO SEED

"Tomato seed may be separated from the pulp by the following procedure: Ripe fruits of the tomato are crushed or cut into pieces—this operation is best accomplished by passing the fruits through an ordinary corn-sheller. The crushed product is then washed, by means of a strong stream of water from a hose, through a series of screens in the following order: 1 mesh, 2 mesh, 4 mesh, 4 mesh, 8 mesh, and finally onto a 16 mesh wire. Each of the screens take out portions of the pulp according to the number of mesh. After the seeds and very small pieces of pulp are washed onto the 16 mesh wire, the entire content of this screen is transferred into washing containers; 50 pound lard cans are very convenient. Since the seeds settle to the bottom of the container much faster than the fine pulp after water has been added, the fine pulp is decanted off just at the state when the seeds

have settled. Three or four washings, depending upon the quantity of the seeds being washed, are required to clean the seed. After the seed have been washed clean, they are transferred to a small container (pail) with a perforated bottom and the excess water is thrown off by whirling (centrifugal action) the container a few times. The seeds are now ready to be transferred to the cheesecloth drying racks. If they are spread in a thin layer on the racks they will dry in a very short time under favorable weather conditions.

"This method has the following advantages of some of the fermenting processes in use:

1. Less equipment is required.
2. The work is more agreeable.
3. Requires less labor (with about 25 man days 58 pounds of seed were saved at the Raymond Branch Experiment Station in 1925).
4. Seeds are easier to dry after placing on drying rack.
5. Eliminates the danger of injuring the seed from fermenting too long, thus giving seed that have a very high germination percentage (97% for seed saved in 1925)."

GENERAL WORK

The Station farm has been terraced and surface drainage is practically controlled. Several rotations are under way, whereby legumes play a prominent part. Irregular soil types found in the same field are gradually being eliminated by growing winter cover crops and summer legumes, in order that these fields may be used for more delicate experimental work. At present there are several acres each growing to a nice stand of vetch, bur and crimson clover. Many acres are now green with fall oats.

Our pasture is well seeded to lespedeza, one of our native soil builders, as well as to white clover, bermuda grass, and paspalum. There is also a project wherein lespedeza is grown to determine its value to a cotton crop that may follow.

A young orchard with several varieties of peaches, apples, and grapes is now growing nicely and will be used as a demonstration, besides determining the best spraying materials to use in growing the most adaptable varieties.

In conclusion, it might be well to state that the past growing season has been the driest in many years and in reviewing the data herein contained, constantly keep that fact before you.