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Report, Raymond Branch Experiment Station, 1926

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By

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A. & M. College, Mississippi
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Report of the Work at the Raymond Branch Experiment Station

By H. F. Wallace

INTRODUCTION

This report contains a summary of the work conducted on the Raymond Branch Experiment Station for the year 1926. The work of previous years may be secured in three publications which cover all experiments conducted on this station since its establishment by an act of the Legislature of 1920. These publications may be secured upon request from the Mississippi Experiment Station, A. & M. College, Mississippi.

As in the past, our experiments were 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. Where possible our results will show averages for various yearly periods which will always be in the last column of the tables.

The 1926 crop year was replete with alarming situations. Predictions were made early that the summer would be cold and wet and many farmers planted their cotton on well drained hillsides; then, the cotton flea was found to be the cause of great damage in some sections. Following this the boll weevil and later the army worm made their appearance. Excessive dry weather in nearly all parts of the state overcame all these fears for cotton and a very heavy yield was made. The dry weather favorable for cotton caused a very low yield of corn that had been planted late. It was evident in this section that soybeans suffered materially from drouth. One field that came under our observation fruited when about twelve inches tall. Fruit did unusually well and most early truck crops made good yields.

The past year was a very satisfactory one for this station. Good stands on fields free from grass throughout the year produced excellent yields, and some good experimental data have been secured. Much credit is due our capable farm manager, Mr. J. C. Peyton, who labored unceasingly to make this one of the best years in the short history of the Raymond Branch Experiment Station.

COTTON

Mississippi has experienced another splendid cotton year from the standpoint of production. Such good yields were obtained over the entire cotton belt, that the price received in many cases has been insufficient to cover the cost of production. The time is here to re-

duce the acreage and increase the yield, on land planted to cotton. It is evident that a poor yield is much more expensive to produce per acre than a good yield. Hence, a wise policy seems to be to make more cotton or less acres.

This may be accomplished by using seed of good varieties and the intelligent use of well balanced fertilizers. It is hardly necessary to add close spacing to the above as it seems that nearly all cotton growers have been convinced of the necessity of having a good stand of cotton.

Our experiments have been conducted along these lines for a period of years. Below may be seen the results of the past years work with twenty-five leading varieties of cotton as shown in Table 1.

TABLE 1—COTTON VARIETY TEST—1926

Variety	Pounds per acre		Lint Data			Total value per acre	Rank in value	
	Seed cotton	Lint	Per-centage	Length	Cents per lb.		1926	Six year average 1921-26
Trice, Miss. Sta.	1489	500.3	33.6	1 f	12.95	74.67	16	6
Trice, Burdette	1327	467.1	35.2	15-16f	12.37	66.38	20	
Cleve., Wan.	1163	462.9	39.8	7-8f	11.67	61.01	22	11
Cleve., Coker	1270	491.2	38.7	7-8f	11.67	65.11	21	
Cleve. 54	1606	595.8	37.1	15-16f	12.37	83.80	10	4
Cleve., Wilson	1485	534.6	36.0	15-16	12.03	73.82	17	
Cleve., Pied.	1176	423.4	36.0	7-8f	11.67	56.94	24	9
Half & Half	1113	465.2	41.8	7-8	11.48	59.88	23	10
Cook 1010	700	296.1	42.3	7-8	11.48	38.03	25	12
Willis	1683	607.6	36.1	15-16	12.03	83.85	9	
Miller	1418	506.2	35.7	1 1-16	13.37	76.80	14	7
Acala	1341	517.6	38.6	1 f	12.95	75.26	15	8
Mexican Big Boll	1246	457.3	36.7	1 1-16	13.37	69.03	19	
D. & P. L. No. 4	1399	556.8	39.8	1 1-16	13.37	82.87	11	
D. & P. L No. 8	1475	613.6	41.6	1 1-16	13.37	90.65	6	
Deltatype Webber	1187	402.4	33.9	1 1-4f	22.37	97.86	2	5
D. & P. L. No. 5	1097	375.2	34.2	1 3-16f	17.53	72.99	18	
Delfos 631	1498	524.3	35.0	1 3-16	16.53	96.40	3	3
Delfos 910	1383	475.8	34.4	1 3-16f	17.53	92.48	4	
Delfos 911	1447	509.3	35.2	1 1-8f	15.37	87.66	8	
Delfos 6102	1495	533.7	35.7	1 1-8f	15.37	91.64	5	1
D. & P. L. No. 6	1485	564.3	38.0	1 3-16	16.53	102.49	1	
Lightning Express	1453	489.7	33.7	1 3-16	16.53	90.58	7	
Lone Star 65	1398	520.1	37.2	1 1-16f	13.78	80.45	12	2
Henderson	1467	557.5	38.0	1	12.70	79.90	13	

Recommendations:—For hill land, it has been found that Miss. Sta. Trice, Willis, Miller, D. & P. L. No. 4, Cleveland 54, and Acala are all good.

For valley land, Delfos 631, Delfos 6102, Lone Star 65, Miss. Sta. Trice, and D. & P. L. No. 6 were found to be excellent. Where a good premium is being paid for extra long staple, it may be profit-

able to grow D. & P. L. No.5 or Deltatype Webber. It should be borne in mind that these extra long stapled varieties demand good, strong valley soil. Quite satisfactory returns were secured from these long stapled varieties in this section this past season despite dry weather.

Fertilizers:—Judicious use of fertilizer has almost doubled the yield of cotton in some of our tests conducted on good valley land, and greater increases might be expected on poorer soils.

As high as 2400 pounds of a complete fertilizer per acre have been used on the station from which good profits were obtained. On plots where the nitrogen was increased to six per cent, excellent gains were made. All fertilized plots produced a profit in our test work this year.

As customary in the past, cooperative fertilizer tests were continued in 1926. All of the past years work along this line was confined to Jefferson County, on one of the farms of Judge Jeff Truly, Fayette, Mississippi. We wish to state here that Judge Truly gave every assistance in his power to add to the success of the project. Besides the general fertilizer test, a variety test and six or seven demonstration acre tests were conducted on various types of soil with varieties and fertilizers thought to be best suited to these soil types. Very satisfactory results were obtained along these lines.

Below is to be found the general fertilizer test conducted on the Station and also the cooperative fertilizer tests conducted near Fayette, Mississippi.

TABLE 2—COTTON FERTILIZER TEST, RAYMOND—1926

Pounds of Material Applied per Acre				Pounds of Seed Cotton per Acre			Dollars per Acre		
Acid Phos.	Nitrate of Soda	Sul. of Potash	Analysis	Plot Yield	Check Yield	Increase	Increase at 5c	Cost of Fert.	Net Gain
No fertilizer				1036.0	1036.0				
300	150	100	8-4-8	1570.0	1054.0	516.0	25.80	9.81	15.99
300	150	75	8-4-6	1542.0	1072.0	470.0	23.50	9.14	14.36
300	150	50	8-4-4	1515.0	1090.0	425.0	21.25	8.47	12.78
No fertilizer				1108.0	1108.0				
300	150	25	8-4-2	1541.0	1071.3	469.7	23.49	7.80	15.69
300	150	.....	8-4-0	1417.0	1034.5	382.5	19.13	7.13	12.00
300	300	50	8-8-4	1694.0	997.8	696.2	34.81	12.89	21.92
No fertilizer				961.0	961.0				
300	225	50	8-6-4	1483.0	976.0	507.0	25.35	10.68	14.67
225	150	50	6-4-4	1553.0	991.0	562.0	28.10	7.80	20.30
150	150	50	4-4-4	1430.0	1006.0	424.0	21.20	7.12	14.08
No fertilizer				1021.0	1021.0				
600	300	100	8-4-4	1667.0	1010.5	656.5	32.83	16.93	15.90
900	450	150	8-4-4	2162.0	1000.0	1162.0	58.10	25.40	32.70
1200	600	200	8-4-4	2319.0	989.5	1329.5	66.48	33.86	32.62
No fertilizer				979.0	979.0				

TABLE 3—COTTON FERTILIZER TEST, FAYETTE—1926

Pounds of Material Applied per Acre				Pounds of seed cotton per acre			Dollars per Acre		
Acid Phos.	Nitrate of Soda	Sul. of Potash	Analysis	Plot Yield	Check Yield	Increase	Increase at 5c	Cost of Fert.	Net Gain
No fertilizer				453.0	453.0				
300	150	100	8-4-8	896.0	451.5	444.5	22.23	9.81	12.42
300	150	75	8-4-6	885.0	450.0	435.0	21.75	9.14	12.61
300	150	50	8-4-4	926.0	448.5	477.5	23.88	8.47	15.41
No Fertilizer				447.0	447.0				
300	150	25	8-4-2	915.0	456.5	458.5	22.93	7.80	15.13
300	150	.....	8-4-0	801.0	466.0	335.0	16.75	7.13	9.62
300	300	50	8-8-4	1073.0	475.5	597.5	29.88	12.89	16.99
No Fertilizer				485.0	485.0				
300	225	50	8-6-4	1128.0	537.8	590.2	29.51	10.68	18.83
225	150	50	6-4-4	958.0	590.5	367.5	18.38	7.80	10.58
150	150	50	4-4-4	996.0	643.3	352.7	17.64	7.12	10.52
No Fertilizer				696.0	696.0				
600	300	100	8-4-4	1261.0	682.0	579.0	28.95	16.93	12.02
900	450	150	8-4-4	1616.0	668.0	948.0	47.40	25.40	22.00
1200	600	200	8-4-4	1866.0	654.0	1212.0	60.60	33.86	26.74
No Fertilizer				640.0	640.0				

Remarks—The test on the Station was conducted in three series on good valley soil. Very dry weather prevailed throughout the growing season. The Fayette plots had probably a little more rain than those in the experiment station. It became necessary to poison the local plots twice for the army worm, the second application was also very effective in controlling the boll weevil. The Fayette plots were poisoned once for the army worm.

It is evident in these tests that each application of fertilizer paid cash returns after paying for the fertilizer. The work for the past two years has shown that where the nitrogen was increased to as high as six per cent in a fertilizer analysis, the profits increased accordingly. The results at this station on a two year average indicate that at least six per cent phosphorus is necessary, but we suggest the continued use of eight per cent to more fully get the benefits from nitrogen used during variable seasons. Some potash is also necessary, and for the above reason at least four per cent should be used.

Recommendations—Use five or six hundred pounds of a fertilizer carrying an 8-6-4 analysis. This may be made aproximately by using 200 pounds sixteen per cent acid phosphate, 150 pounds fifteen per cent nitrate of soda, and 100 pounds twelve per cent kainit. Any quantity may be mixed, and used at any rate per acre desired.

If this crop follows highly fertilized truck crops the year before, it may be safe to cut the phosphorus and potash to half and lower

the nitrogen to four per cent. On lands infested with coco or Johnson grass, apply only half the nitrogen and make side applications with the other half after the cotton has been chopped. Where red clay hillsides are to be used it may be advisable to leave the potash off. Fertilizer pays on fertile soil as well as on poor soil and to make "more cotton on less acres", the judicious use of fertilizer will aid to a great extent.

TABLE 4—AVERAGE RESULTS OF NITROGEN SOURCES TEST—1926

Pounds of material applied per acre	Pounds of seed cotton per acre			Per cent Increase	Two year average seed cotton increase—Pounds
	Plot Yield	Check Yield	Increase		
No nitrogen	1569.0	1569.0			
150 Nitrate soda	2005.0	1621.3	383.7	23.67	351.6
112.5 Sulphate ammonia	1942.0	1673.5	268.5	16.04	269.6
86.5 Leunasaltpeter	2116.0	1725.8	390.2	22.61	.....
No nitrogen	1778.0	1778.0			
105 Calcium Cyanamid	1763.0	1721.3	41.7	2.42	193.4
150 Calcium nitrate	1913.0	1664.5	248.5	14.93	285.3
48.9 Urea	1839.0	1607.8	231.2	14.38	298.1
No nitrogen	1551.0	1551.0			

Remarks—Quite a bit of attention has been given to finding the best nitrogen fertilizer to use in mixing fertilizers. In this connection only the results given in Table 4 are submitted. As will be observed, Leunasaltpeter was only used in 1926 and could not be included in the two year average. This work was conducted in three series and all applications were based on twenty-two and one-half pounds of actual nitrogen per acre, or expressing it in nitrate of soda, 150 pounds would be required per acre. It appears that several new sources are promising.

Potash Sources—Some work was also done with sources of potash under cotton this past year. At present only one years work has been conducted with kainit, sulphate of potash, and muriate of potash. Kainit contains twelve pounds of actual potash, while sulphate and muriate of potash contain approximately fifty and forty-eight pounds, respectively, of actual potash to every one hundred pounds. More work must be done with sources of potash before any recommendations can be made.

TABLE 5—COTTON SPACING TEST—1926

Number of stalks		Yield seed cotton pounds per acre	Rank in production
Plot	Foot		
339	.68	1810.0	5
636	1.28	1898.3	4
839	1.68	1975.8	3
1118	2.25	2077.0	2
1141	2.29	2142.5	1

Remarks—It is our opinion that close spacing along with good cotton years and judicious use of fertilizers and varieties has been responsible for the over-production of cotton. The above table, like tables in the past, reveals the fact that where the number of stalks per foot is increased, then follows an increased yield of seed cotton. Quick maturing, medium sized, small leaf varieties will stand closer spacing in the drill than the slow growing, large leaf varieties. The poorer classes of soil will stand closer spacing than the fertile valley soils.

The above test was conducted in four series with Lone Star 65 cotton and fertilized with five hundred pounds of an 8-5-4 fertilizer. Two applications of calcium arsenate were made to combat the army worm and the boll weevil.

Conclusions—This test, along with results in the past, indicate leaving two to three stalks per foot, using three and one-half foot rows on valley land. On hill land, use three foot rows and leave three to five stalks per foot in bunches. More cotton can be made on fewer acres by the proper use of fertilizer, good varieties, practical cultural methods, and close spacing as recommended above.

CORN

Mississippi has reached the point where the "live at home" program must be practiced. We must raise enough food and feed to supply the farm needs, before we can raise cash crops successfully.

The work here has been conducted along these lines by conducting variety, fertilizer, and nitrogen sources tests with corn. Very good results were obtained this past year although practically all of our corn was made with very little rain. All corn plots were located on valley land, however.

Below may be seen the results of the variety work with corn in Table 6.

TABLE 6—CORN VARIETY TEST—1926

Variety	Yield shelled corn Bus. per acre	Per cent of grain	Rank 1926	Average bus, 1922-26	Average rank 1922-26
Mosby, Station	39.27	78.9	5	30.01	7
Mosby, Delta	37.96	77.9	9	30.36	5
Mosby, Lee	32.23	83.2	19		
Mosby, Suttle	36.83	80.7	11		
Cocke's Prol., Station	40.45	80.0	2	31.58	2
Cocke's Prol., Delta	36.75	75.8	12	29.71	9
Hastings	39.00	78.7	7	29.05	10
Johnson's Prol.	40.15	78.7	3		
Delta Prolific	36.59	77.3	13		
Mexican June	39.19	75.6	6	30.67	4
Laguna	42.87	80.9	1	33.91	1
Ellis	37.07	75.7	10	30.32	6
Paymaster, Neal	36.18	78.0	14	29.78	8
Paymaster, Fisher	40.15	78.6	3		
Yellow Dent, Ferg.	32.44	78.3	18		
Yellow Dent, Sta.	37.98	78.2	8		
Golden Dent, Ulla.	35.03	75.1	17		
Golden Dent, Sta.	35.23	76.4	16		
Whatley's Pro., Raym'd.	36.11	74.4	15	31.52	3

Remarks—The above test was planted around the middle of May in six series on a well prepared seed bed. A mixture of 100 pounds of acid phosphate, 200 pounds of nitrate of soda, and 50 pounds of kainit was applied per acre. Good stands were secured but excessive dry weather reduced the yield. It will be observed that the 1926 results are given in full and in the last two columns a five year average has been compiled with ten varieties. Attention is called to the fact that out of nineteen leading varieties, there was a difference of 10.64 bushels per acre in the leader and the last variety. The table speaks for itself, but care should be taken in selecting varieties as to the size of ear as some farmers desire very large eared varieties.

For very late planting, Mexican June and Laguna will probably give the best results.

TABLE 7—CORN FERTILIZER TEST, Raymond—1926

Pounds of material applied per acre			Analysis	Bushels of corn per acre			Dollars per acre		
Acid phos.	Nitrate of soda	Sul. of potash		Plot yield	Check yield	Increase	Increase at $1.00	Cost of fert.	Net gain
No fertilizer				11.90	11.90				
300	150	100	8-4-8	22.00	11.43	10.57	10.57	9.81	.76
300	150	75	8-4-6	22.90	10.95	11.95	11.95	9.14	2.81
300	150	50	8-4-4	21.40	10.48	10.92	10.92	8.47	2.45
No fertilizer				10.00	10.00				
300	150	25	8-4-2	23.80	11.33	12.47	12.47	7.80	4.67
300	150	....	8-4-0	27.00	12.65	14.35	14.35	7.13	7.22
300	300	50	8-8-4	32.80	13.98	18.82	18.82	12.89	5.93
No fertilizer				15.30	15.30				
300	225	50	8-6-4	32.80	15.90	16.90	16.90	10.68	6.22
225	150	50	6-4-4	30.20	16.50	13.70	13.70	7.80	5.90
150	150	50	4-4-4	30.40	17.10	13.30	13.30	7.12	6.18
No fertilizer				17.70	17.70				

TABLE 8—NITROGEN SOURCE TEST WITH CORN, RAYMOND—1926

Pounds of materials	Bushels ear corn per acre			Per cent increase
	Plot yield	Check yield	Increase	
No nitrogen	36.2	36.2		
150 Nitrate soda	52.3	35.8	16.5	46.1
112.5 Sulphate ammonia	42.8	35.4	7.4	20.9
86.5 Leunasaltpeter	43.4	35.0	8.4	24.0
No nitrogen	34.6	34.6		
105 Calcium cyanamid	40.5	33.7	6.8	20.2
150 Calcium nitrate	48.8	32.8	16.0	48.8
48.9 Urea	45.0	31.8	13.2	41.5
No nitrogen	30.9	30.9		

Remarks—In fertilizing corn, one is compelled to be careful not to use more fertilizer than will show a profit. Corn does not require the fertilizer that is often used with cotton. Satisfactory yields are obtained more often from corn without fertilizer than from cotton without fertilizer, due to the fact that a farmer knows that he cannot grow corn on poor land successfully and for that reason puts it on his bottom land. In too many cases it is forgotten after being worked out and all attention given to cotton and it is surprising to see that a fair yield is obtained even though it is left to "grow wild".

General fertilizer work at this station has given good results and promising sources of nitrogen have been tested. A change is to be made in the general fertilizer work to more nearly conform with the fertilizer needs.

Recommendations—For general use, a mixture of 100 pounds of

acid phosphate, 150 pounds of nitrate of soda, and 50 pounds of kainit per acre will probably cover our requirements on corn land. Where good farming and frequent cultivation is to be done, from 50 to 100 pounds of nitrate of soda or sulphate of ammonia, or the equivalent in equal pounds of nitrogen from some other quick acting source might be profitably used as a side dressing. This side dressing should be applied when the corn is about knee high, just after a good rain if possible.

It might be stated here that any equivalent form of potash may also be used in the place of kainit, provided the price justifies.

SOYBEANS

A test was conducted to determine the amount of hay, as well as the yield of grain, per acre of some of the leading varieties of soybeans. These beans followed a crop of crimson clover and were planted around the first of June. Dry weather prevailed and a poor stand resulted. Replanting of skips followed around the last of June and as the dry weather continued, a poor stand was secured.

The results from this test could not be considered accurate, but it might be stated that the Virginia matured two weeks earlier than the Laredo and three weeks earlier than the Mammoth Yellow. The Laredo produced more hay than either of the other two and did not shatter as badly when cut. The Otootan is a very desirable bean and makes a splendid bean to grow with corn. It will produce as much and probably more hay per acre than the Laredo but on account of maturing three or four weeks later it must be harvested at a time when cotton picking should be done. The Biloxi and Mammoth Yellow beans have course main stems and stock will often leave this portion of the plant unless it is made into a ground feed. All these beans are excellent soil builders of the summer legume class and every row of corn in Mississippi should be planted in soybeans also. They work well in a two year rotation with cotton, vetch, corn and soybeans.

TOMATOES

The trucking section of Mississippi has been taken into consideration by this Station and due to the importance of the tomato, it has been given quite a bit of attention. Various tests have been conducted as to varieties, sources of nitrogen, sources of potash, and to determine the best formulae in producing tomatoes. These tests follow in tabular form.

TABLE 9—TOMATO VARIETY TEST—1926

Variety	Yield in pounds per acre		Percentage picked early		Percent of shippers	Average size of shippers lb.
	Total	Shipping tomatoes	Total	Shipping tomatoes		
Globe	6830	3127	47.6	30.0	45.8	.280
Gulf States	9552	5543	37.7	33.3	58.0	.254
Detroit	7830	4608	43.0	39.6	58.8	.258
Marglobe—Red	7870	4443	45.5	45.1	56.5	.286
Marvel	6204	2608	32.2	22.2	42.1	.238
Norton—Pink	7455	3742	40.6	34.9	50.2	.272
Richards	8696	4474	46.4	41.3	51.5	.268
Burpee—1099	6029	2062	52.1	32.9	34.2	.273

Remarks—Seed were planted in the hotbed January 19, 1926. The plants were set in the field March 4 and skips reset March 9. Poisoned bait was used over the entire field and cutworms were controlled practically one hundred per cent. The above test was in three series.

Conclusions—The Gulf States Market on the three year average has been the heaviest yielder but it must be noted that the fruit is smaller than the Globe or Detroit or the wilt resistant Marglobe and Norton-Pink. The latter two, along with Marvel, are good varieties to plant on wilt infested soil. Many growers get good packs by mixing Globe and Gulf States when planting in the hotbed as the Gulf States, being smaller, will fill in the basket and help eliminate "shake". A check of the field showed practically no wilt in Marglobe.

TABLE 10—ANALYSIS TEST WITH TOMATOES—1926

Analysis	Pounds per acre		Percent. shippers	Per cent picked early		Dollars per acre		
	Total	Shippers		Total	Shippers	Total value at 6c	Cost of fert.	Net gain
				(1500 pounds per acre)				
10-3-3	9783	4114	42.0	36.2	31.1	246.81	19.74	227.07
8-3-3	10964	5542	50.5	38.3	27.9	372.49	18.05	314.44
8-4-3	12206	5979	48.9	37.8	26.6	358.74	21.01	337.73
8-5-3	11269	6657	59.0	31.5	15.4	399.39	23.96	375.43
				(2000 pounds per acre)				
10-3-3	11833	6689	56.5	34.4	25.3	401.34	26.32	375.02
8-3-3	12456	7250	58.2	38.2	32.7	434.97	24.07	410.90
8-4-3	10308	5282	51.2	25.5	17.9	301.69	28.01	273.68
8-5-3	12169	6519	53.5	30.0	25.8	391.11	31.95	359.16

Remarks—The analysis test was conducted to determine the fertilizer analysis best suited to producing tomatoes economically. This work has not advanced enough to make any definite conclusions. The test was conducted in two series. All nitrogen was derived from equal pounds of nitrogen from nitrate of soda, sulphate of ammonia, and cottonseed meal. Potash was derived from sulphate of potash.

TABLE 11—AVERAGE RESULTS OF NITROGEN SOURCES TEST WITH TOMATOES—1924, 1925 and 1926

Source of Nitrogen	Pounds per acre		Per cent shippers	Per cent picked early		Total value dollars
	Total	Shippers		Total	Shippers	
	(1500 pounds of an 8-4-3 per acre)					
Nitrate of soda	9536	4417	47.2	41.3	56.2	274.01
Ammonium sulphate	9216	4139	44.5	48.9	58.4	257.34
Combination	8987	4333	48.2	41.6	49.7	268.79
Urea	8916	4385	49.3	44.8	51.3	271.40
Cottonseed meal	9095	4286	47.4	43.5	51.2	266.95
	(2000 pounds of an 8-4-3 per acre)					
Nitrate of soda	9611	4309	46.5	45.7	54.4	269.29
Ammonium sulphate	9085	4163	47.3	48.8	56.5	259.42
Combination	10930	4913	46.5	47.0	55.2	306.95
Urea	10100	5098	51.1	45.8	52.8	315.52
Cottonseed meal	10063	4830	49.2	41.2	48.3	300.69

Remarks—The above test was conducted to determine the best source of nitrogen to use in a fertilizer formula for producing tomatoes commercially. Where a combination is listed it means the nitrogen was derived from equal pounds of nitrogen from nitrate of soda, sulphate of ammonia, and cottonseed meal. The other nitrogen was derived from sources indicated. Phosphorus from acid phosphate and potash from sulphate of potash.

There are several promising sources and, at present, the limiting data seems to slightly favor Urea, with others closely following. More work will have to be done to make any definite recommendations. This work was conducted in three series and was handled as stated in the variety work. The Globe variety was used in this test.

TABLE 12—AVERAGE RESULTS OF POTASH TESTS WITH TOMATOES—1924 1925 and 1926

Analysis	Pounds per acre		Per cent shippers	Per cent picked early		Dollars per acre		
	Total	Shippers		Total	Shippers	Total value	Cost of fert.	Net gain
	(1000 pounds per acre)							
8-4-0	13321	6326	43.5	38.6	47.3	393.10	10.44	382.96
8-4-3	13564	6035	45.2	42.0	45.8	376.61	12.00	364.61
8-4-6	13963	6111	44.3	46.6	47.6	382.07	13.56	368.51
	(1500 pounds per acre)							
8-4-0	14118	6419	46.2	43.5	49.3	400.02	15.66	384.36
8-4-3	12285	5567	46.7	49.5	40.7	347.6	18.00	329.64
8-4-6	13112	6999	52.9	41.1	43.7	439.5	29.31	410.22
	(2000 pounds per acre)							
8-4-0	13625	6279	47.2	39.1	44.2	391.34	20.88	370.46
8-4-3	13548	6355	47.3	47.6	47.1	394.74	24.00	370.74
8-4-6	13387	6069	45.6	39.9	42.6	377.96	27.12	350.84

Remarks—Like the preceding table, the above data represents a three year average. The motive in this test is to determine the most economical amount of potash to use in growing tomatoes. Sulphate of potash was used in all formulas, nitrogen was derived from the above mentioned combination and phosphorus from acid phosphate. This test covered four series this past year.

From varying amounts and indications, it is felt safe to state that some potash is necessary and three per cent is suggested, as the availability of the nitrogen and phosphorus to get best results might depend on some potash. From observation, a more stockily built plant results from the use of some potash.

TABLE 13—AVERAGE RESULTS OF ENGLISH PEA FERTILIZER TEST—1924, 1925 and 1926

Fertilizer analysis	Yield per acre, pounds	Value at 5c	Cost of fertilizer	Net gain
	(1000 pounds per acre)			
10-3-3	3693	179.65	11.59	168.06
8-3-3	2811	140.55	10.49	130.06
8-4-3	2774	138.70	12.00	126.70
	(1500 pounds per acre)			
10-3-3	3185	159.25	17.39	141.86
8-3-3	3367	168.35	15.74	152.61
8-4-3	3100	155.00	18.00	137.00

TABLE 14—AVERAGE RESULTS OF NITROGEN SOURCES TEST WITH ENGLISH PEAS—1924-25-26

Rate per acre of 8-4-3, pounds	Yield using nitrate soda, pounds	Yield using ammonium sulphate, pounds
1000	4182	4106
1500	4028	4290

Remarks—Tables 13 and 14 represent a fertilizer test to determine the best analysis and the source of nitrogen to use in growing English or green peas for the market. These tests were conducted in two series and the Alaska and Gradis peas were used. All nitrogen was derived from the above mentioned combination. The tables show a three year average and indications point toward 1000 pounds per acre of a 10-3-3 and in the nitrogen test slightly in favor of sulphate of ammonia, however, this seems slightly immaterial. Further information along these lines will be published in the future.

TABLE 15—AVERAGE RESULTS OF SNAP BEAN FERTILIZER TEST—1924, 1925 and 1926

Fertilizer analysis	Yield per acre, lb.	Value at 5c	Cost of fertilizer	Net gain
		(1000 pounds per acre)		
10-3-3	4131	206.55	11.59	194.96
8-3-3	3663	183.15	10.49	172.66
8-4-3	3564	178.20	12.00	166.20
		(1500 pounds per acre)		
10-3-3	3745	187.25	17.39	169.86
8-3-3	3597	179.85	15.74	164.11
8-4-3	3880	194.00	18.00	176.00

TABLE 16—AVERAGE RESULTS OF NITROGEN SOURCES TEST WITH SNAP BEANS—1924-25-26

Rate per acre of an 8-4-3 pounds	Yield using nitrate soda, pounds	Yield using Ammonium sulphate, pounds
1000	3632	3714
1500	4186	4441

Remarks—The above tables represent three years work with snap or green beans. The combination was used in securing nitrogen in Table 15, while in Table 16 the nitrogen was derived as indicated. The Red Valentine variety was used.

Indications point toward 1000 pounds of a 10-3-3 and the three year average is in favor of using sulphate of ammonia. This work will be continued in the future.

GENERAL WORK

Rotations—It is our policy to grow a legume on all lands at least once a year. Several rotations are under way and outstanding among these is the two year rotation with cotton, vetch, corn and soybeans. This gives a legume on the land summer and winter and does not interfere materially with either crop.

To start this, at the last cultivation of cotton, sow seventeen to twenty pounds of vetch seed to the acre. This germinates in the fall and matures seed around the middle of May and the first year must be turned under to insure a volunteer crop the following fall. After turning under, plant the land to corn and soybeans. As stated, the vetch volunteers and in the spring may be turned under or cut for hay as desired and then planted to cotton. Permit vetch to mature seed every other year and be insured of a volunteer stand every year.

In this connection, bur clover will also reseed itself and may be used in a similar rotation.

Legumes—Much benefit has been derived from using bur clover, vetch, and crimson clover as winter legumes. Crimson clover is an annual and must be planted each year. As stated above, vetch and bur clover will reseed themselves if permitted to mature seed once every two years.

Soybeans, velvet beans, peas, and lespedeza comprise the best summer legumes for this section. Lespedeza reseeds, while the others must be planted each year. These legumes fit into rotations nicely and are recognized as excellent soil builders.

Orchards—A nice young orchard has been started and results show that with a little attention given to prunning, spraying and cultivation, anyone can produce excellent fruit in this section. Vetch grows profusely in our orchard and contributes liberally toward the fertilizing program for the trees. This vetch was started four years ago and volunteers each year.

Boll Weevil Work—Hibernation and emergence work along this line has been done in connection with the State Plant Board. There are at present five cages of six hundred weevil each located on the station. These cages are watched daily throughout the emergence period and records are kept to determine the percentage of emergence during the season. Several cotton states are doing this work.

Irish Potatoes—Much work has been done with certified seed against uncertified seed in Irish potato work. Some very promising results were obtained by the State Plant Board in cooperation with the Station along these lines in 1925. Dry weather and poor stands caused such irregularity in 1926 that the results were not worth publishing. This work will be continued in 1927.

Improvements—Many improvements have been made on the Station during the past year. A new bungalow has been erected for the farm manager and also a new tenant house constructed. The barn has been covered with a new galvanized roof. Extensive repairs have been made on fences and an electric line extended to the Station residence. Landscaping has come in for its share of attention.

Conclusion—A successful years work has come to a close. We wish to express appreciation to Dr. B. M. Walker, President of A. & M. College, and to Director J. R. Ricks of the Experiment Station for the kind and business-like manner in which they have directed the work of the Raymond Branch Experiment Station.