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Report of the South Mississippi Branch Experiment Station for 1931

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REPORT

OF THE

SOUTH MISSISSIPPI BRANCH EXPERIMENT STATION FOR 1931

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MISSISSIPPI AGRICULTURAL EXPERIMENT STATION
A. & M. COLLEGE, MISSISSIPPI

W. R. PERKINS, Director.

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The plans and policies of the South Mississippi Branch Station in former years have been adhered to fairly closely for 1931. Since the station is designed to serve the people, it cannot be expected to be a money making or even a self-supporting enterprise, because money is required to run any business. That business which expends all its energies in serving the people must necessarily have a source of income elsewhere. The station is doing research on the best methods for the production and utilization of farm products, a system of permanent agriculture through crop rotation, legume cover crops and the control of soil erosion, and the distribution of agricultural information to the farmers of all or a part of 27 counties of South Mississippi embracing approximately 10 millions of acres. This region is sufficienly different from the other regions of the state to justify special attention to crop adaptability, methods of cultivation, and general management of the soil.

COVER CROPS

Winter cover crops have been grown on almost all the cultivated land of the station. Those showing special merit are: hairy vetch, monantha vetch, pearl vetch, Austrian winter pea, Canadian winter pea, bur clover, black medic, and crimson clover. Oats, wheat, barley, and abruzzi rye have also done well. Cover crops are very valuable in reducing erosion. Since most of the soils of the Longleaf Pine region contain 20 to 30 per cent of fine sand and silt, the cultivation of the rolling areas makes conditions favorable for severe erosion. Nature's method of preventing erosion and restoring fertility to the land is to cover it with a carpet of grass and clover which also greatly increases the water holding capacity of the soil. According to Dr. H. H. Bennett of the Bureau of Chemistry and Soils, the plant food removed annually from the soils of cultivated fields of the United States is 21 times that removed by crops. Most of this loss is prevented by keeping the land covered with sod.

In order to determine whether certain winter cover crops and fertilizer treatments have a controlling influence on cotton wilt, an experiment was made and the results recorded in Table 1.

Table 1—Effect of Cover Crops with and without Commercial Fertilizers on Cotton Wilt

	Without Commercial Fertilizer		With 600 lbs. 6-8-4 Fertilizer	
Cover Crops	Lbs. seed cotton per acre	Per cent wilt infection	Lbs. seed cotton per acre	Per cent wilt infection
Check	297	35.7	793	34.4
Austrian winter pea	358	46.6	883	37.4
Vetch	409	48.9	861	40.6
Rye	394	41.8	861	40.0
Check plus 4 tons manure	861	42.5	1108	37.7
Oats	337	48.0	867	42.7
Check plus 8 tons manure	1018	40.1	1201	29.5

These results indicate a slight increase in wilt infection for both the winter cover crops and stable manure but a decrease in wilt for the 6-8-4 fertilizer. There is no direct relationship between the wilt infection however, and the yield of cotton, though the manured plots give the highest yields and when supplemented with a mixed fertilizer they show lowest wilt infection.

NITROGEN SOURCES TEST WITH COTTON

This test has been conducted on the same land for four consecutive years. The basic fertilizer used was 0-8-4 at the rate of 600 pounds per acre. The plots to which nitrogen was applied received it at the rate of 36 pounds of nitrogen per acre. The results are given in table 2. The results are averages of triplicate plots with the exception of nitrate of soda, ammonium sulphate, and calcium cyanamid, which were replicated four times.

Table 2—Nitrogen Sources Test with Cotton—B. S. Field

Source of Nitrogen	Lbs. of seed cotton per acre	Check yield	Increase
Check	430	.....	.....
Nitrate soda	950	437	513
Ammonium Splphate	866	445	421
Cal. Cyanamid	960	452	508
Check	460		
Cal Nitrate	810	465	345
Urea	796	470	326
Cal Urea	830	475	355
Leunasalpeter	885	480	403
Check	486	.....	.....

ORGANIC NITROGEN SOURCES TEST WITH COTTON

The object of this test is to determine the comparative efficiency of organic and inorganic nitrogen from different sources under cotton. A uniform fertilizer treatment consisting of 600 pounds per acre of an 0-8-4 fertilizer was made to all plots. Nitrogen from the different sources was applied at the rate of 24 pounds per acre. This test has been conducted on twenty-five 1-20 acre plots for six successive years. The results are given in table 3 and show no decided advantage for one source of nitrogen over another in the five year average.

Table 3—Organic Nitrogen Sources with Cotton—Kendrick Smith Field

Source	Lbs. seed cotton per acre	Check yield	Increase 1931	Increase Average 1927-31
Check	483	.....	.....	.....
Dried blood	941	533	408	379*
Fish scrap	855	583	272	213
Tankage	893	633	260	201
Check	683	.....	.....	.....
½ Fish scrap plus ½ Nitrate soda	1032	705	327	222
½ Tankage plus ½ Nitrate of soda	1151	728	423	263
Cal. nitrate	1161	750	411	261
Check	772	.....	.....	.....

*Results from dried blood are for 3 years only.

NITROGEN ANALYSIS AS SIDE DRESSING WITH COTTON

This is the second consecutive year of the test. The basic fertilizer used was 0-8-4 analysis at the rate of 800 pounds per acre. The plots on which the nitrogen was applied before planting received it at the rate of 16 pounds of nitrogen per acre. The rates used in side dressing were 16, 32, and 48 pounds of nitrogen per acre. Triplicate plots were used for each treatment and the results are given in table 4.

Table 4—Nitrogen Analysis Side Dressing with Cotton—B. S. Field

Treatment before planting	Side dressing lbs. nitrogen	Lbs. seed cotton per acre	Check yield	Increase	Increase 2-year average
0-8-4	....	517	.....	.....	.....
2-8-4	16	1111	497	614	407
2-8-4	32	1288	477	811	498
2-8-4	48	1354	457	897	576
2-8-8	48	1445	437	1008	578
0-8-4	....	417	.....	.....	.....

COOPERATIVE NITROGEN AND POTASH ANALYSIS TEST WITH COTTON

This station has conducted cooperative fertilizer tests for several years in different counties on different types of soil using 1-30 acre plots with three replications. The purpose of the tests is to determine what fertilizer to apply to the different soils to obtain best results. The work this year was conducted on eight farms located in the counties of Jones, Forrest, Stone, Harrison, Hancock, and George and the fertilizer applied at the rate of 800 pounds per acre. In Jones county the test was conducted in cooperation with C. N. Dabbs, Smith-Hughes teacher of the Shady Grove Consolidated School, and on the farm of E. N. Lee. In Forrest county two tests were conducted; one in cooperation with W. R. Knight, Smith-Hughes teacher of the Eatonville Consolidated School, on the farm of O. H. Bedsole. and the other with F. O. Cork. In Stone county two tests were conducted in cooperation with G. W. Hughes and S. E. Snowden, Principal of the Home Consolidated School. In Hancock county one test was conducted on the farm of J. E. Smith in cooperation with C. P. Baker, Principal of the Sellers Consolidated School. In George county one test was conducted in cooperation with L. L. Cowart, Smith-Hughes teacher of the Agricola Vocational High School, and on the farm of Harry Bryant. A corn nitrogen sources test was conducted on the farm of Ernest Ladner.

Table 5—Cooperative Nitrogen and Potash Analysis Tests for Cotton

Analysis:	Lbs. seed cotton per acre	Increase over 0-8-4	Lbs. seed cotton per acre	Increase over 0-8-4
	(1) O. H. Bedsole—Forrest County		(2) Home Vocational School—Stone County	
0-8-4	860	.....	710	.....
4-8-4	942	82	780	70
6-8-4	980	120	668	—42
8-8-4	894	34	634	—76
8-8-8	938	78	768	58
	(3) G. W. Hughes—Stone County		(4) F. O. Cork—Forrest County	
0-8-4	754	.....	604	.....
4-8-4	1142	388	866	262
6-8-4	1174	420	740	136
8-8-4	1056	302	770	166
8-8-8	1112	358	626	22
	(5) Harry Bryant—George County		(6) E. N. Lee—Jones County	
0-8-4	812	.....	982	.....
4-8-4	1106	294	1008	26
6-8-4	1070	258	892	—90
8-8-4	1014	202	942	—40
8-8-8	922	110	882	—100
	(7) J. E. Smith—Hancock County		Average of the 7 cooperative tests	
0-8-4	1182	.....	843	.....
4-8-4	1186	4	1004	161
6-8-4	1142	—40	952	109
8-8-4	1230	48	934	91
8-8-8	1126	—56	910	67

NITROGEN AND POTASH ANALYSIS TEST WITH COTTON—POPLARVILLE

Two of these tests were carried out on the station farm, one on the Anderson field and the other on the Boyd Smith field. Table 6 gives the results from Anderson field. It will be observed that there was a gradual increase from both nitrogen and potash as the quantity of these fertilizers is increased. The field is highly infested with wilt and, hence, gives a good opportunity to observe the effect of the fertilizer treatments on the control of cotton wilt. While the increase of potash above 32 pounds per acre reduced the wilt some in each case, some beneficial effect resulted also from nitrogen, the source of which is Arcadian nitrate of soda. But complete control was not obtained by any one of the treatments, as the infection counts show. Tables 6 and 7 show only slight increases for either nitrogen or potash in amount above 32 pounds per acre.

Table 6—Potash and Nitrogen Analysis Test with Cotton—A. Field

Analysis 800 lbs. per acre	Lbs. seed cotton per acre	Increase for Nitrogen	Increase for Potash	Per cent wilt infection
6-8-0	500	.....	.....	37.3
6-8-4	565	.....	65	31.7
6-8-8	677	.....	177	24.7
6-8-12	725	.....	225	22.0
0-8-4	262	.....	.....	31.1
4-8-4	552	290	.....	31.4
8-8-4	642	380	.....	27.2

Table 7—Potash and Nitrogen Analysis Test with Cotton—B. S. Field

Analysis 800 lbs. per acre	Lbs. seed cotton per acre	Check yield	Increase 1931	Average 1928-31 Lbs. seed cotton per acre	Average 1928-31 Increase
0-8-4	365	.....	.....	617	.....
4-8-4	1026	383	643	976	349
6-8-4	1224	401	823	1118	481
8-8-4	1338	419	919	1195	548
8-8-8	1406	437	969	1220	563
0-8-4	454	.....	.....	668	.....

POTASH ANALYSIS TEST WITH COTTON

The rates of application of potash ranges from none to 112 pounds of potash per acre. As a basic treatment, all plots received fertilizer at the rate of 800 pounds of a 6-8-0 mixture per acre. Table 8 gives the results which are averages of three replications.

Table 8—Potash Analysis Test with Cotton—B. S. Field

Lbs. potash per acre	Lbs. seed cotton per acre	Check yield	Increase 1931	Increase Av. 1928-31	Per cent wilt infection
None	898	.....	.....	.....	13.3
32	1096	913	183	84	7.0
64	1114	928	186	66	6.9
80	1060	944	116	71	6.2
96	1087	959	128	64	3.9
112	1146	974	172	162	5.0
None	990	.....	.....	.....	30.8

This test has been conducted on the same land for four successive years. A basic mixture of 6-8-0 fertilizer was applied to all plots at the rate of 800 pounds per acre and 32 pounds of potash applied from the different sources. The data are given in Table 9 and are averages of three replications.

Table 9—Potash Sources Test with Cotton—B. S. Field

Source	Lbs. seed cotton per acre	Check yield	Increase	Per cent wilt infection
	1068	.....	.....	14.6
Muriate	1343	1064	179	5.0
Pot. Sulphate	1142	1060	82	8.5
Kainit	1195	1057	138	1.3
D. M. S.	1102	1054	48	4.8
Check	1051	.....	.....	11.3

POTASH SOURCES TEST WITH COTTON

The potash sources test was started this year and includes five different sources of potash. Last year the soybean variety test was conducted on this land which had received an application of 400 pounds of a 4-8-4 fertilizer per acre. For this test all plots received an application of 800 pounds of an 8-8-0 fertilizer per acre. The potash plots received 64 pounds of potash from the different sources which makes the final application an 8-8-8 fertilizer. The soil is very badly infested with cotton wilt. Table 10 gives the average results from triplicate plots.

Table 10—Potash Sources Test with Cotton

Source	Lbs. seed cotton per acre	Check yield	Increase	Per cent wilt infection
Check	894	.....	.....	11.3
Trona	954	862	92	5.4
Muriate	914	830	84	7.2
Sulphate	872	799	73	11.1
Kainit	888	767	121	13.7
D. M. S.	752	736	16	19.4
Check	704	.....	.....	21.2

Table 11—Potash Sources and Rates Tests with Cotton—Neal Field

Source	Lbs. potash per acre	No. 1		No. 2	
		Lbs. seed cotton per acre	Per cent wilt infection	Lbs. seed cotton per acre	Per cent wilt infection
Check	None	1038	11.8	1207	22.8
Muriate of potash	48	1231	7.7	1155	4.8
Sulphate of potash	48	1150	4.0	1273	4.6
D. M. Salts	48	1262	13.1	1325	6.6
Kainit	48	1293	7.6	1250	4.2
Muriate of potash	24	1204	11.6	1221	10.3
Muriate of potash	60	1017	7.2	1207	14.5
Muriate of potash	72	1255	8.8	1221	6.2

The land on which the potash sources and rates tests were conducted received a uniform treatment of 600 pounds of a 6-8-0 fertilizer per acre. Although the wilt infestation counts indicate some beneficial effect from the potash, the yield shows no such effect.

POTASH SIDE DRESSING WITH COTTON

For the years 1928, 1929, and 1930 a basic mixture of 6-8-4 fertilizer was applied before the planting at the rate of 800 pounds per acre. For this year this same fertilizer analysis was applied at the rate of 600 pounds per acre and muriate of potash applied as a side dressing. The results are given in table 12 and represent the averages of triplicate plots.

Table 12—Potash Side Dressing with Cotton—B. S. Field

Side dressing per acre	Lbs. seed cotton per acre	Check yield	Increase		Per cent wilt infection
			1931	Average 1928-31	
Check	982	.....	.....	....	11.2
50	931	981	—50	—46	8.2
100	1005	979	26	—20	7.1
150	1061	977	84	18	5.0
200	962	975	—13	—9	6.3
250	1094	973	121	70	6.8
Check	971	.....	.....	....	11.0

SUPERPHOSPHATE VS. RHUM'S PHOSPHATE

A basic mixture of a 4-0-4 fertilizer was applied to all plots at the rate of 600 pounds per acre. Superphosphate was applied at the rate of 300 pounds per acre and Rhum's phosphate at the rate of 300, 400, and 600 pounds per acre. Table 13 gives the results, and they indicate little or no response to phosphate treatment.

Table 13—Ruhm's Phosphate vs. Superphosphate with Cotton—B. S. Field

Materials	Lbs. per acre	Seed cotton per acre	Check yields	Increase
Superphosphate	300	795	.....	....
Ruhm's phosphate	600	742	783	—41
Ruhm's phosphate	400	746	770	—24
Ruhm's phosphate	300	762	757	5
Superphosphate	300	744	.....	....

FACTORY VS. HOME-MIXED FERTILIZERS WITH COTTON

The fertilizers used in this test were: Meridian factory mixed 4-8-4; Plant Food 4-6-4; and home-mixed 4-8-4. In the home-mixed 4-8-4 fertilizer, nitrate of soda, superphosphate, and muriate of potash were used. The results were obtained from six replications and are reported in Table 14. A five-year average shows no significant difference in these fertilizers.

Table 14—A Comparison of Factory-Mixed and Home-Mixed Fertilizer with Cotton—K. S. Field

Material applied per acre	Analysis	Lbs. seed cotton per acre	Check yield	Increase 1931	Average increase 1927-31
Check		321	.....	.....	.....
600 Meridian	4-8-4	1204	357	847	531
600 Home-mixed	4-8-4	1267	393	874	544
600 Plant Food	4-8-4	1193	429	764	501
Check		465	.....	.....	.....

HIGH ANALYSIS VS. LOW ANALYSIS FERTILIZERS WITH COTTON

The comparison of high analysis fertilizers with low analysis fertilizers is being made on 20 one-twentieth acre plots. On this test there are two high analyses and two low analyses of fertilizers used. The 4-8-4 is compared with 12-24-12 and 3-9-3 with 9-27-9. The same amount of plant nutrients is applied to low and high members of each group. The results are given in Table 15. A four-year average shows no difference in crop response between these fertilizers.

Table 15—A Comparison of High Analysis and Low Analysis Fertilizers with Cotton—K. S. Field

Analysis	Lbs. fertilizer applied per acre	Lbs. seed cotton per acre 1931	Lbs. seed cotton per acre Average 1928-31
4-8-4	600	964	946
12-24-12	200	894	920
9-27-9	200	976	949
3-9-3	600	1007	928

WILT VARIETY TEST WITH COTTON

For the past several years this station has been conducting a wilt variety test to determine the varieties of cotton most resistant to wilt or that produce the highest yield of cotton on wilt infested soil. This year's test included twenty varieties and strains. Each of these varieties was planted in single row plots and in four replications. A uniform application of 800 pounds per acre of a 6-8-4 fertilizer was made to the plots. Table 16 gives the results.

Table 16—Wilt Resistant Varieties of Cotton Compared—A. Field

Variety	Lbs. lint per acre	per cent lint	Length	Cents per lb.	Dollars per acre	Rank	Per cent wilt infection
Cleveland 54	412.5	34.9	29/32	5.60	26.95	4	10.1
Wilson Type	364.9	32.3	27/32	4.00	18.42	15	17.7
Clev. Piedmont	228.2	32.1	13/16	3.50	10.40	19	20.5
Clev. Coker 884-4	250.6	34.1	31/32	5.90	17.21	16	23.0
Half and Half	291.2	42.4	25/32	3.00	10.72	18	28.9
Acala 37	314.8	32.8	1	6.10	22.43	10	14.5
Stoneville 2	371.7	35.1	1	6.10	26.11	7	23.9
Stoneville 3	440.7	37.1	31/32	5.90	29.74	2	33.6
Delfos 468	343.5	33.0	1	6.10	24.44	8	19.2
Delfos 531	250.0	34.3	1 1/8	7.35	20.76	12	65.6
D. & P. L. 10	393.1	36.0	31/32	5.90	26.68	5	20.7
Lightning Exp. 8	370.8	30.1	1 1/16	6.65	28.97	3	3.1
Express 41077	258.4	34.0	1 1/16	6.65	19.69	14	21.9
Express 17	395.6	34.1	1 1/16	6.65	30.12	1	8.3
Missdel 1	186.8	32.9	1 1/32	6.40	13.87	17	55.3
Miller 610	310.7	33.2	15/16	5.75	21.60	11	18.9
Deltatype Webber	120.7	34.3	1 3/32	6.90	9.49	20	68.9
Rowden	391.6	34.0	15/16	5.75	26.32	6	17.1
Farm Relief	285.3	34.8	1	6.10	20.07	13	51.5
Lone Star 561	356.0	37.4	29/32	5.60	22.92	9	44.2

Table 17—Five year Average—Cotton Varieties—Poplarville—1927-31

	Lint per acre	Total value	Rank in value	Per cent lint	Length
Wilson Type	382.3	59.05	4	33.2	7/8
Cleveland 54	380.9	61.17	3	35.1	15/16
Missrel 2	360.5	63.21	1	33.4	1 1/16
Half and Half	354.0	49.13	10	41.0	25/32
Express	351.9	62.52	2	33.1	1 3/32
D. & P. L. 4-8	346.3	55.29	5	37.3	31/32
Piedmont Cleveland	332.2	52.30	9	33.9	27/32
Lone Star	326.8	54.22	6	35.1	1
Miller	316.5	53.53	7	35.1	1
Acala	311.4	52.57	8	33.8	1
Webber	239.0	46.64	11	31.7	1 5/32

The main cotton variety test includes 22 varieties replicated five times. Cleveland 54 was repeated at intervals to serve as a measure of soil variation. A uniform application of 800 pounds per acre of a 6-8-4 fertilizer was made to all plots. The results are recorded in Table 19.

Table 18—Miscellaneous Cotton Variety Test—A. Field

Variety	Lbs. lint per acre	Per cent lint	Length	Cents per lb.	Dollars per acre	Rank
Cleveland 54	384.7	34.2	29/32	5.60	25.24	11
Clev. 5, Strain 3	340.6	33.9	31/32	5.90	23.42	13
Wanamaker Clev. (Extra Early)	340.0	34.0	1	6.10	24.04	12
Wanamaker Clev. Strain 3	359.3	35.4	29/32	5.60	23.40	14
Wanamaker, Dixie Triumph	476.3	34.9	1	6.10	33.49	2
Rowden 40	331.2	31.4	15/16	5.75	22.66	15
Foster 7	435.2	34.0	1 5/32	7.85	38.38	1
Missdel 1	344.5	31.9	1 3/32	6.90	27.45	9
Missdel 2	392.7	34.0	1 1/16	6.65	29.92	5
Missdel 3	352.0	32.0	1 1/8	7.35	29.61	6
Missdel 4	420.6	35.5	1 1/16	6.65	31.79	3
Lone Star 562	465.5	37.7	31/32	5.90	31.31	4
Miller 613	433.5	54.0	15/16	5.75	29.14	8
Miller 656	398.4	34.2	15/16	5.75	26.74	10
Miller 682	428.5	34.7	31/32	5.90	29.31	7

Table 19—The Main Cotton Variety Test—A. Field

Variety	Lint	Per cent lint	Length	Cents per pound	Total value per acre	Rank in value
Cleveland 54	505.1	33.1	15/16	5.75	34.14	14
Cleveland 884-4	536.0	34.1	1 1/32	6.40	39.48	7
Wilson Type	569.2	32.4	7/8	5.50	37.25	10
Cleveland Piedmont	363.1	33.1	27/32	4.00	18.20	24
Half and Half	449.9	38.1	13/16	3.50	19.41	23
Acala 37	384.2	31.7	1	6.10	27.58	22
D. & P. L. 4-8	456.6	36.1	15/16	5.75	30.29	20
Miller 589	401.1	33.4	1	6.10	28.62	21
Cleveland 54	516.3	33.4	31/32	5.90	35.61	13
Miller 610	459.5	33.3	1	6.10	32.63	15
Rowden 2088	530.6	32.9	15/16	5.75	35.92	12
Deltatype Webber	338.9	30.7	1 3/16	8.30	31.95	18
Farm Relief	512.8	34.7	1 3/32	6.90	40.21	6
Lightning Exp. 8	547.6	30.8	1 3/32	6.90	43.93	3
Express 17	484.5	31.9	1 3/32	6.90	38.60	8
D. & P. L. 10	572.1	34.3	1	6.10	40.38	5
Cleveland 54	547.1	32.9	29/32	5.60	36.22	11
Missdel 1	405.6	32.4	1 3/32	6.90	32.22	16
Delfos 531	551.6	32.8	1 1/8	7.35	46.19	2
Missdel 2	495.1	31.7	1 1/16	6.65	38.25	9
Stoneville 2	565.7	32.7	1 1/32	6.40	42.02	4
Stoneville 3	592.0	34.5	1	6.10	46.73	1
Lone Star 561	465.8	34.1	31/32	5.90	31.98	17
Lone Star 562	465.2	34.8	31/32	5.90	31.81	19

CORN VARIETIES

The Main Station at A. and M. College furnished the seed for the 18 varieties of corn which were used in the test. The varieties were planted in single row plots and replicated nine times. Fertilizer of a 4-8-4 analysis was applied before planting at the rate of 400 pounds per acre. Table 20 gives the results.

Table 20—Corn Varieties—Boyd Smith Field

Variety	Bushels corn per acre	Per cent grain	Rank
Mosby Station	31.6	85.0	9
Mosby Delta	32.2	85.0	4
Mosby, Suttle	32.2	87.5	3
Cocke's Pro. Sta.	32.1	85.0	6
Cockes' Pro. Wood	32.1	80.0	5
Hastings	31.9	87.5	7
Jellicorse	32.5	87.0	1
College 47	32.5	85.0	2
Laguna	30.2	81.0	11
Mexican June	31.6	84.7	10
Reese Drouth Resistant	30.2	76.1	12
Paymaster	28.9	87.5	16
Dixie White Dent	31.7	85.0	8
Yellow Dent, Ferg.	30.0	82.0	13
Golden Dent R-H	27.4	85.0	18
College G-4	27.5	85.0	17
Imp. Golden Dent	29.9	85.0	14
Jarvis	29.3	85.0	15

Table 21—Corn Varieties—Poplarville—5 Year Average—1927-31

	Total bushels per acre						
	1927	1928	1929	1930	1931	Average	Rank
Mosby, Station	50.6	36.6	41.0	9.0	31.6	33.8	3
Mosby, Delta	51.0	23.7	36.5	8.8	32.2	30.4	8
Mosby, Suttle	43.9	27.7	31.0	9.6	32.2	28.9	9
Cocke's Prolific	53.7	39.9	34.5	10.0	32.1	34.0	2
Hastings	55.1	34.7	35.5	10.0	31.9	33.4	4
Laguna	49.4	38.2	37.0	11.9	30.2	33.3	5
Mexican June	46.9	37.8	35.0	20.3	31.6	34.3	1
Paymaster	47.1	31.7	35.5	14.3	28.9	31.5	6
Yellow Dent, Ferguson	42.7	28.6	27.5	13.3	30.0	28.4	10
Golden Dent	46.3	31.4	32.0	16.6	27.4	30.7	7

FACTORY-MIXED VERSUS HOME-MIXED FERTILIZERS WITH CORN

The test consists of 25 one-twentieth acre plots and is planned to compare a 4-8-4 home-mixed fertilizer with two popular brands of factory-mixed fertilizers of the same analysis. The home-mixed fertilizer was prepared from nitrate of soda, superphosphate, and muriate of potash. The results are given in Table 22 and show a slight advantage for the home-mixed fertilizer.

Table 22—A Comparison of Factory and Home-Mixed Fertilizers With Corn—K. S. Field

Material applied per acre	Analysis	Bushels per acre	Check yield	Increase over check
Check		19.5	.....	.....
600 Meridian	4-8-4	38.4	19.6	18.8
600 Home-mixed	4-8-4	40.4	19.7	20.7
600 Plant Food	4-8-4	38.9	19.8	19.1
Check		19.9	.....	.....

SUGAR CANE

For several years this Station has done cooperative experimental work with the United States Department of Agriculture in an effort to find varieties of sugar cane resistant to the Mosaic and root diseases. The Federal Department has supplied us with numerous varieties, some of which are grown at the United States Sugar Plant Field Station, Canal Point, Florida, where sugar cane flowers and seeds and others have been collected by the Department from various parts of the world. Last year we planted and cultivated 48 varieties of cane; this year we kept only 14 varieties. Three of these—P. O. J. 213, Cayana, and C. P. 807—have been considered of superior merit warranting release for planting. This year we have distributed cane of these three varieties to about 350 farmers in South Mississippi and to some as far north as Lauderdale County. The P. O. J. 213 and Cayana varieties are Mosaic-tolerant, and C. P. 807 is resistant to both the Mosaic and root-rot diseases. The C. P. 807 has proved to be a vigorous grower, exceedingly hardy, and produces

syrup of good flavor. A good crop of C. P. 807 produces from 550 to 650 gallons of syrup per acre. In pounds of sugar per acre, it has out-yielded varieties of P. O. J. by 900 to 1500 pounds per acre. From the data in Table 23 it will be observed that C. O. 290 out-yielded the other varieties in percentage juice and second to Cayana in tonnage per acre.

Table 23—Sugar Cane Variety Test

Variety	Tonage per acre	Per cent juice	Stand percentage
C. P. 807	25.54	60.0	98
P. O. J. 213	13.09	56.89	72
36 M	12.24	61.78	65
P. O. J. 234	14.97	60.18	85
C. O. 290	27.73	62.33	98
Cayana	29.59	59.79	100

SOYBEANS

Soybeans will grow on any soil that produces cowpeas, and have some advantages over them. Soybeans stand up better under extreme weather conditions of temperature and moisture than cowpeas. They are well adapted to grazing and are as rich in protein as alfalfa. The viney types, as Laredo and Otootan, make a splendid hay. The plant is a good soiling crop, a valuable green manure, and a grazing crop of high value.

The average amount of oil and protein found in seed of 16 varieties by the writers was 17.48 per cent oil, and 38.92 per cent protein. Of 6 varieties showing the highest percentage of oil and protein, the average was 18.89 and 42.37 per cent respectively. Soybeans planted in every third row of corn can be harvested by means of soybean harvester. Ours is of the type drawn by two mules and operated by two men. This harvester threshes the beans and scatters the stems and leaves over the ground. Of the 32 varieties grown in our plots this year, the following showed superior merit: Illini, Manchu, Morse, Mansey, Virginia, Delta 5401, and Biloxi Station.

PEANUTS

As a money crop, peanuts bid fair to occupy an important place in our section of the state. The crop is inexpensive to plant, easy to cultivate, and is harvested with little difficulty. The United States Department of Agriculture has established five grades of peanuts, varying with their purity, development, and freedom from trash, which fact makes peanuts a standard product on the market. The Station grew 75 varieties of peanuts this year, but the major portion of the crop, about two acres, was planted to White Spanish, Jumbo Spanish, Virginia Runner and the Virginia Bunch varieties. We have yet to determine the best fertilizer for yield, and for the prevention of "pops", and the best machine for picking.

TUNG-OIL PLANT

The tung-oil plant has been grown on our Station for five years and has borne fruit three years. Approximately 6000 acres of it is grown in Pearl River County and 2000 acres in adjacent counties. The nuts of this tree furnish an oil valuable for painting, making oil cloth, linoleum, etc. The meal residue left after extracting the oil is a valuable nitrogenous fertilizer, but is said to be poisonous to live stock. The construction of a tung-oil mill in this county is now under consideration. In 1929 alone, 60,000 tons of tung oil was imported and sold at from 12 to 14 cents per pound.

HORTICULTURE

The horticultural investigations include experiments with varieties, cultural methods, propagation, pruning, fertilizers and insect and disease control of most of the horticultural crops that are grown in South Mississippi. More than 700 individual plots, trees, and plants are included in these investigations.

FRUITS

Peaches—Variety, fertilizer, and pruning experiments are being conducted. Varietal recommendations were made in 1930 Station report, Bulletin 285, based upon ten years' results. The old trees have been removed, but the test is being continued with 48 varieties varying in age from 1 to 8 years. The object of this work is to determine the most desirable varieties for home use, markets, and canning. Special attention is being given to finding desirable varieties that will prolong the fruiting season of the home orchard.

The rejuvenation of a 10-year old Early Rose peach orchard has been in progress for one year. The treatments used are light, moderate, and heavy pruning plus 12 pounds per tree of 4-8-4 fertilizer. While conclusions should not be reached after a single year's observation, it is evident that fewer and larger fruits and greater tree growth resulted from trees receiving the heavier pruning.

Pecans—The variety test, which includes 12 varieties, has not produced sufficient crops to warrant definite recommendations. The trees are only 11 years old. Growers should continue to plant the 3 standard varieties, Stuart, Success, and Schley, until other varieties can be recommended.

Grapes—The fact that the better dessert varieties of grapes do not thrive so well as the native varieties necessitates considerable investigational work. Forty varieties of grapes are being grown to determine those which are best adapted to our conditions. Varieties which have produced crops since 1920 are: Delaware, Delicious, Herbemont, Lenoir, and Muench, of the bunch grape group, and Flowers, James, Scuppernong, and Thomas, of the muscadine group. While the Delaware is the most desirable for table use, the others are promising for juice and jelly making. A one-acre vineyard of Thomas was planted in 1929 to demonstrate proper training, pruning, and cultural methods. It produced a light crop of fruit in 1931.

Figs—The studies on seven varieties of figs grown under clean cultivations and straw mulch have been continued. Under clean cultivation Green Ischia is the only variety that produces satisfactory crops. Both Lemon and Seleste produce fruits almost twice as large under mulch culture as under clean culture. Moreover, it has been observed that the trees on mulched areas not only make more growth but also shed their leaves later in the season than do the trees grown under clean cultivation.

Brambles—Observations on the behavior of several varieties of dewberries and raspberries are being continued. The Van Fleet raspberry and Young dewberry are the only varieties found to be apparently suitable for this section.

Citrus Fruits—The experimental plantings include more of the satsuma orange than any other, because it is the most hardy and is most likely to become an important commercial citrus fruit crop in this section. In the winter of 1929-30, some of these trees were killed to the soil embankment while others were not so badly injured. The minimum temperature was 16°F. Three of these cold-resistant trees produced an average of 261 fruits this year, while fourteen of the cold-susceptible trees produced an average of only 48 fruits per tree.

Other citrus fruits in the test are: lemon, Tomasville citrangequat, tangerine, kumquat, orange, grapefruit, calamondin, citrange, tangelo, and lime. While all of these have made vigorous growths since the injury from cold two years ago and produced some fruits this year, one lemon tree produced 52 fruits and one citrangequat tree 445 fruits.

VEGETABLES

Sweet Potatoes—The varietal tests, started in 1927 have been continued. The yields for 1931 were unusually low, which, if combined with those of previous years, would make very low averages. However, the growers should continue to plant the standard varieties, Porto Rico and Nancy Hall.

Irish Potatoes—The results of the test comparing the yielding ability of northern and local grown seed are given in Station Circular No. 85 and show beyond question the superiority of northern grown seed. Copies of this circular may be obtained by writing to the Director, Agricultural Experiment Station, A. and M. College, Mississippi, or to the South Mississippi Substation, Poplarville, Mississippi.

Melons—The test of several varieties of watermelons, started a few years ago, has been continued this year. The results show that the varieties Wonder and Stone Mountain produced the greatest total yield. Furthermore, these varieties possess high quality and good shipping ability. They enjoy great popularity where known. They can be recommended without hesitation to growers in South Mississippi.

Table 24—Yields of Various Watermelon Varieties—1930-31

Name	No. melons per acre	Weight largest melon	Av. wt. per melon	First melons shipped 1931	Remarks Rind	Flesh
Halbert Honey	1195	30.5	17.3	July 18	Thin	Sweet, tender
Stone Mountain	1803	25.5	21.5	July 10	Medium	Tender, good quality
Kleckley Sweet	1563	32.5	17.3	July 10	Thin	Tender, medium qality
New Schochler	711	48.5	29.0	July 23	Thick	Tender, medium qality
Thurmond Gray	1108	41.0	23.4	July 23	Thick	Firm, medium quality
Tom Watson	1449	43.0	18.1	July 23	Medium	Tender, firm, poor
Wonder	2047	39.0	19.9	July 10	Medium	Tender, good quality
"Monroe"	1118	47.0	32.2	July 10	Medium	Tender, good quality
Augusta Rattlesnake	1711	23.5	18.2	July 23	Thick	Tough, poor quality.
"Floribama" 1	941	40.0	18.6			
"Boyd Stewart" 2	832	37.0	21.3			

NOTE:

1. 1931 only—raised from seed secured from melon bought in Monroe, Louisiana.
2. 1930 only—locally grown sort.

WORK ON COMMERCIAL FERTILIZERS WITH SNAP BEANS, IRISH POTATOES, AND TOMATOES

As in past years, various fertilizer combinations were compared with the standard 4-8-4 mixture. The land was prepared for planting February 19 and the fertilizer application of 1600 pounds per acre, unless otherwise stated, made the following day. Certified Wisconsin Triumph potatoes were planted twelve inches apart in three-foot rows February 20. Giant Stringless snap beans were planted in eighteen-inch rows March 16, and Marglobe tomatoes were planted in four-foot rows eighteen inches in the drill April 16. The tomatoes were pruned according to the single stem system and staked. No topping was practiced.

Table 25—Effect of various fertilizer treatments on yields of beans, potatoes and tomatoes compared with that of a standard 4-8-4 treatment measured in net gain or loss in dollars per acre—1931

Treatment	Dollars Gain or Loss Per Acre Beans	Irish Potatoes	Tomatoes
4-8-0	4.37	—9.00	117.69
4-8-2	.....	11.29	.....
4-8-6	.....	1.23	.....
4 8-8	24.13	3.39	15.45
4-8-12	—12.00	.....	79.26
.....	—46.90	—6.79	—303.56
6-8-4	10.38	—7.26	—167.90
8-8-4	—17.34	—5.96	—72.04
10-8-4	—59.78	—11.66	—94.50
12-8-4	—99.24	.....	—48.54
4-4 4	.....	—8.99	.....
4-6-4	.....	12.25	.....
4-8-4 *1	.....	12.89	.....
Manure *2	—100.10	.....	.....
15-30-15 *3	—85.88	.....	—122.06

*1—1600 pounds per acre
*2—10 tons per acre
*3—375 pounds per acre

The results presented in Table 25 show the net gain or loss in dollars per acre of the various treatments compared to the standard 4-8-4 fertilizer. With increased applications of nitrogen above six per cent the yield of beans decreased. Furthermore, differences were observed in growth characteristics. Plants receiving high nitrogen possessed deep green thick foliage and short pods of poor quality. Growers should learn to correlate type of growth with size and quality of yield. Vigorous vegetative growth should be avoided. Growers should continue to use the standard 4-8-4 mixture or fertilizer with a 1-2-1 ratio until other ratios are found to be superior to it for South Mississippi.

Roses—Continued observations have been made of the twenty-four varieties of bush roses planted three years ago. Since these roses are growing on their own roots, many of them lack the necessary vigor of growth to produce satisfactory crops. Apparently these varieties should be established on one of the strong-rooted stocks if best results are to be obtained. Table 26 summarizes the results for 1930 and 1931.

Table 26—Yields of Various Rose Varieties—1930-31

Name	Average Number of Blooms Per Bush								
	April	May	June	July	August	Sept.	Oct.	Nov.	Total
Wellesley	17	9	7	8	3	7	4	5	60
Wm. Shean	4	7	4	7	3	8	6	2	41
Antoine Revoire	8	4	4	8	1	4	5	2	29
White Killarney	1	1	1	1	1	1	4	2	12
Etoile De France	5	5	6	1	3	6	3	4	33
White Cochet	4	12	4	3	2	4	4	4	36
Duchess De Brabant	3	12	14	4	3	7	9	2	54
Bridesmaid	6	9	9	6	7	8	5	5	55
Mrs. Chas. Bell	13	14	6	3	1	3	1	1	42
American Beauty	12	11	7	1	1	3	6	3	44
Souvenir De Malmaison	3	6	4	3	2	3	2	5	28
Segong Weber	11	5	2	1	0	3	3	2	27
Columbia	14	5	4	1	1	2	3	2	32
F. W. Dunlop	6	6	2	1	0	3	1	3	22
Madame Butterfly	10	4	4	1	2	5	3	4	33
La France	12	8	8	3	1	5	2	3	43
Mrs. B. R. Cant	11	17	15	4	4	10	14	7	82
J. L. Mock	6	5	4	2	1	5	4	4	31
Golden Ophelia	2	7	4	1	1	3	2	3	23
Paul Heyron	11	13	7	4	1	3	2	3	44
Souvenir De Claudius Pernet	1	3	3	1	1	1	1	0	11
Ophelia	7	5	5	2	3	8	4	9	43
Marie Van Houtte	13	24	12	8	8	6	5	7	73
Wm. R. Smith	3	8	3	3	1	2	2	2	24

Ornamentals—The fifty different ornamental shrubs and trees growing in the landscape planting on the station grounds are being closely observed to obtain information on which recommendations may be made. Although this station does not furnish the services of a landscape architect, advice is given on the adaptability and general uses of, as well as on methods of pruning for, most ornamentals which should be planted about homes and public grounds in Mississippi.

SUMMARY

The winter cover crops which have shown special merit are: hairy vetch, Austrian winter pea, monantha vetch, pearl vetch, black medic, and crimson clover. Experiments were conducted on the effect of winter cover crops and commercial fertilizer on cotton wilt. Wilt infestation was higher on the plots which grew the cover crops than it was on the other plots.

A balanced commercial fertilizer seemed to have a depressing effect on cotton wilt; but there is not a direct relationship between wilt infestation and the total yield of cotton. Apparently boll-weevil injury is partially responsible for the results.

In the results given, dried blood, fish scrap, tankage, and calcium nitrate are of approximately equal value as a source of nitrogen under cotton. An average of seven cooperative nitrogen and potash analysis tests shows no advantage of increasing the nitrogen and potash above 32 pounds per acre. Potash applied as a side dressing at the rates of 16, 32, and 48 pounds of potash per acre shows a slight increase in one test on the Boyd Smith field, but another test on the same field showed no increase from side dressing with potash.

The data submitted show home-mixed and factory-mixed fertilizers are of approximately equal value. The same is true of high analysis and low analysis fertilizers when compared on basis of actual plant food carried.

In the Main Cotton Variety Test, Stonevill 3, Delfos 531, Lightning Express 8, Stoneville 2, and D. & P. L. 10 are the five highest yielding varieties in the order named. In five-year average, the five leading varieties are Missdel 2, Express, Cleveland 54, Wilson Type, and D. & P. L. 4-8 respectively.

A five-year average of corn varieties gives highest yields for Mexican June, Cocke's Prolific, Station Mosby Hastings, and Laguna in the order named. Four varieties of sugar cane, P. O. J. 213, Cayana, C. P. 807, and C. O. 290, show outstanding value.

As money crops in South Mississippi, peanuts and the tung oil tree show considerable promise.

Heavy pruning gave better results than light pruning in rejuvenating a 10-year old Early Rose peach orchard when 12 pounds of 4-8-4 fertilizer was used per tree.

The Stuart, the Success, and the Schley are the three leading varieties in a test of 12 varieties of pecans.

While the Delaware grape, is the most desirable for table use, the Delicious, Herbemont, Lenoir, Muench, Flowers, Scuppernong, and Thomas are promising for juice and jelly making.

Under mulch culture, the Lemon and Celeste varieties of fig produced fruit almost twice the size that they did under clean culture.

Three cold-resistant satsuma orange trees produced an average of 261 fruits, while 14 of the cold-susceptible trees produced an average of 48 fruits after a minimum temperature of 16°F. in the winter of 1929-30. One lemon and one citrangequat tree withstood the cold favorably and produced 52 and 445 fruits respectively.

In a variety test, the Wonder and Stone Mountain waterlemons not only produced the greatest yield but also possessed high quality and good shipping ability.

The results of a fertilizer test with snap beans, Irish potatoes, and tomatoes show the standard 4-8-4 mixture or a 1-2-1 ratio to be the best fertilizer for vegetables for general use in South Mississippi.

In a test of 24 varieties of bush roses, Mrs. B. R. Cant, Marie Van Houtte, and Wellesley are the leading varieties judged by the number of roses per bush.