Summary of Some

AGRONOMIC EXPERIMENTS

on the Substations, Experiment Fields, and Main Station, 1930-1955

Department of Agronomy and Soils

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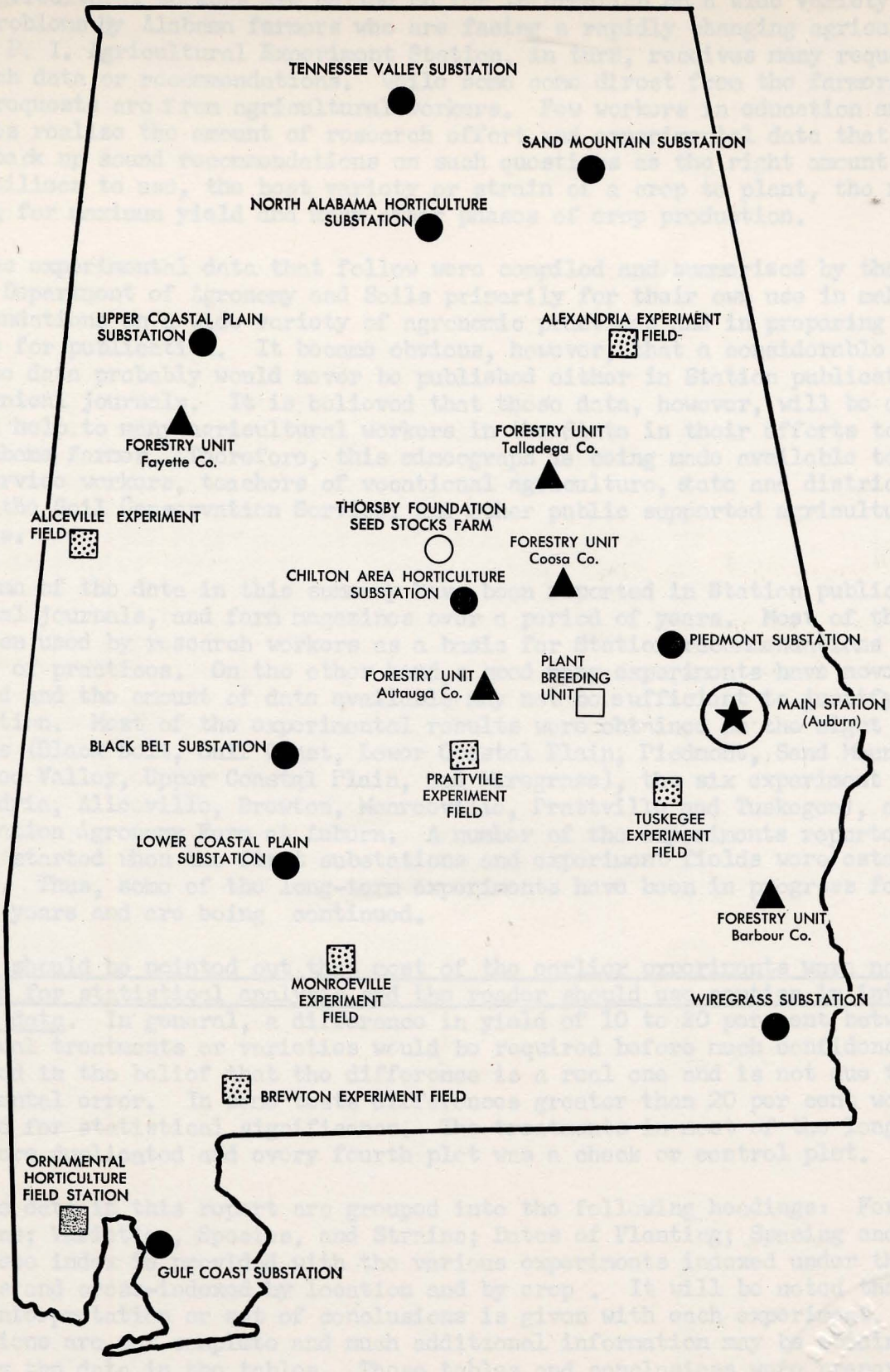
Agricultural Experiment Station
of the Alabama Polytechnic Institute
Auburn, Alabama

The AGRICULTURAL EXPERIMENT STATION SYSTEM of the ALABAMA POLYTECHNIC INSTITUTE



To: The Agricultural Workers of Alabama

Subject: A Compilation of Data from Agronomic Experiments Conducted in Alabama 1930-55

Agricultural workers are called on for information on a wide variety of agronomic problems by Alabama farmers who are facing a rapidly changing agriculture. The A. P. I. Agricultural Experiment Station, in turn, receives many requests for research data or recommendations. While some come direct from the farmers many of these requests are from agricultural workers. Few workers in education and action agencies realize the amount of research effort and experimental data that is needed to back up sound recommendations on such questions as the right amount and kind of fertilizer to use, the best variety or strain of a crop to plant, the right spacing for maximum yield and many other phases of crop production.

The experimental data that follow were compiled and summarized by the staff of the Department of Agronomy and Soils primarily for their own use in making recommendations on a wide variety of agronomic practices and in preparing manuscripts for publication. It became obvious, however, that a considerable amount of these data probably would never be published either in Station publications or technical journals. It is believed that these data, however, will be of interest and help to many agricultural workers in the State in their efforts to serve the Alabama farmer. Therefore, this mimeograph is being made available to extension service workers, teachers of vocational agriculture, state and district personnel of the Soil Conservation Service, and other public supported agricultural agencies.

Some of the data in this summary have been reported in Station publications, technical journals, and farm magazines over a period of years. Most of the data have been used by research workers as a basis for Station recommendations on a variety of practices. On the other hand, a good many experiments have never been reported and the amount of data available may not be sufficient to justify formal publication. Most of the experimental results were obtained on the eight substations (Black Belt, Gulf Coast, Lower Coastal Plain, Piedmont, Sand Mountain, Tennessee Valley, Upper Coastal Plain, and Wiregrass), the six experiment fields (Alexandria, Aliceville, Brewton, Monroeville, Prattville and Tuskegee), and the Main Station Agronomy Farm at Auburn. A number of the experiments reported herein were started when the first substations and experiment fields were established in 1929. Thus, some of the long-term experiments have been in progress for more than 25 years and are being continued.

<u>It should be pointed out that most of the earlier experiments were not designed for statistical analysis and the reader should use caution in interpreting the data</u>. In general, a difference in yield of 10 to 20 per cent between the individual treatments or varieties would be required before much confidence can be placed in the belief that the difference is a real one and is not due to experimental error. In some tests differences greater than 20 per cent would be required for statistical significance. The treatments in most of the long-term tests were duplicated and every fourth plot was a check or control plot.

The data in this report are grouped into the following headings: Fertility; Rotations; Varieties, Species, and Strains; Dates of Planting; Spacing and Culture. A complete index is provided with the various experiments indexed under these headings and cross-indexed by location and by crop . It will be noted that a brief interpretation or set of conclusions is given with each experiment. These conclusions are not complete and much additional information may be obtained by studying the data in the tables. These tables and conclusions were prepared by members of the staff and questions about any particular experiment can be directed to the research worker whose name is given.

It is impossible to give due recognition to a long list of research workers on the Substations, Experiment Fields, and Main Station who have contributed to the planning, conducting, recording and analyzing the data of these experiments. Many of the research workers who made major contributions to these results are no longer members of the experiment station staff due to resignation, retirement, or death. It is to all of these workers that much of the credit should go for their long hours of careful and painstaking work in the actual conduct of these field tests.

Howard T. Rogers

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Agronomy and Soils Department

SUMMARY OF THE INDEX

EXPERIMENTS ON FERTILITY

FERTILITY (Cont'd)

(Cont'd)

(Cont'd)

(Cont'd)

(Cont'd)

(Cont'd)

(Cont'd)

EXPERIMENTS ON COTTON

C O T T O N (Cont'd)

C O R N (Cont'd)

L E G U M E S

ANNUALS

Summer (Cont'd)

ANNUALS

L E G U M E S

L E G U M E S

Introduction to the Two-Year Rotation Fertilizer Experiment on Cotton, Corn, and Winter Legumes

This experiment was started in the fall of 1929 at eight locations in Alabama. It is a study of the effects of fertilizers and legumes on yields of cotton and corn in a two-year rotation with winter legumes being grown for green manure preceeding the corn crop. Summer legumes were planted in the corn through the 1945 crop. These experiments were conducted uniformly at all locations through 1948. Some changes were made in 1949 and the rates of potash at the different locations vary some since that time. The rate of phosphate at the Wiregrass Substation is also different from the other locations since 1949. Rates of nitrogen were increased at all locations beginning in 1949.

Results of these experiments have been summarized in the tables which follow. Yields from all plots are reported in pounds of seed cotton, bushels of corn, and pounds of green weight of winter legume produced per acre. Tables 1E through 1L give summaries of yields at each location by periods from 1930 through 1954. Tables 1C and 1D give summaries for all locations for the periods 1930-48 and 1949-54, respectively.

Tables 1A, 1B, and 1M give summaries of the response to the various treatments at all locations for cotton, corn, and winter legumes, respectively. These tables show results of the primary comparisons which can be made of yields from these experiments. Since these data are so extensive and results vary so much between locations, these summary tables are presented instead of a discussion of the results. When applying data from these summary tables to the individual locations, one should carefully check the treatments with the table for the location concerned.

Soil types on which these experiments are located at the various substations and experiment fields are as follows:

Alexandria - Decatur silt loam

Aliceville - Prentiss very fine sandy loam

Browton - Kalmia fine sandy loam

Monroeville - Magnolia fine sandy loam

Prattville - Greenville sandy clay loam

Sand Mountain - Hartselle fine sandy loam

Tennessee Valley- Decatur clay loam

Wiregrass - Norfolk fine sandy loam

Table 1A Summary of Response of Cotton to Treatments in the Two-Year Rotation Fertilizer Experiment at Eight Locations 1930-54 (Summary of Tables 1C to 1L)

Response to:	With	Treatment:	Increase in Lbs. Seed Cotton per Acre																	
			Alex.		Alice.		Brew.		Monroe.		Pratt.		Sand Mt.		Tenn.V.		Wiregrass		Average	
			30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54
P	-	2 Minus 1	333	351	331	407	62	362	277	434	178	249	231	266	408	522	282	424	263	377
K	P	3-2	93	61	229	172	453	387	254	430	195	439	431	457	55	88	107	329	227	295
2N	PK & Leg.	4-3	134	92	237	184	298	555	217	259	250	155	399	467	27	124	243	122	226	245
L	P	6-2	-51	21	-251	-78	-73	32	29	141	45	-61	-4	-6	-102	-59	58	67	-44	7
L	PK	7-3	-31	88	-32	31	123	238	171	257	103	39	258	305	-69	-50	46	10	71	115
L	2NPK	8-4	-56	36	-39	20	102	323	155	253	50	10	129	25	-16	-40	38	-62	45	71
K	PL	7-6	113	128	448	280	649	593	396	546	253	539	693	768	88	97	95	272	342	403
2N	PKL&Leg.	8-7	109	40	230	174	277	640	201	255	197	126	273	187	80	134	235	50	200	201
Legume	NPKL	11-10	333	224	381	197	214	55	340	256	526	121	468	156	240	217	274	332	347	195
2K-K	N2PL	15-14	47	53	6	-24	318	437	68	32	16	-2	99	60	-6	-20	-7	-124	68	51
2P	N2KL	15-16	429	---	383	---	264	---	325	---	174	---	616	---	337	---	220	---	344	---
2NPKL	Legume	8-9	700	768	788	743	934	1525	822	1205	556	715	847	1038	485	629	605	755	717	922

Rate of Fertilizer Materials

1930-48

P = 600# Superphosphate per rotation - 200 to cotton, 400 to vetch
K = 75# Muriate per rotation - 25 to cotton, 50 to vetch
2N = 200# Sodium nitrate per rotation - 100 to cotton, 100 to corn
L = 2000# lime applied in 1930

1949-54

P = 800# Superphosphate per rotation - 400 to cotton, 400 to vetch (Wiregrass 600# superphosphate per rotation)
K = 100# Muriate per rotation - 50 to cotton, 50 to vetch (Aliceville, Prattville and Tennessee Valley 75# Muriate per rotation)
(Brewton 150# muriate per rotation)
2N = 400# sodium nitrate per rotation - 200 to cotton, 200 to vetch

J.T. Cope

Table 1B Summary of Response of Corn to Treatments in the Two Year Rotation Fertilizer Experiment at Eight Locations 1930-54
(Summary of Tables 1C-1L)

Response to:	With	Treatments	Increase in Bushels of Corn per acre																	
			Alex.		Alice.		Brewton		Monroe.		Pratt.		Sand Mt.		Tenn. V.		Wiregrass		Average	
			30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54
P	---	2 Minus 1	10.4	13.1	16.6	16.5	4.3	16.2	9.4	14.9	10.6	5.4	17.4	19.3	9.6	23.4	4.5	-1.3	10.4	13.4
K	P	3-2	0.4	-0.4	0.8	1.6	4.1	5.1	2.5	5.0	1.1	2.1	4.2	8.8	-0.1	-.4	1.8	3.2	1.8	3.1
2N	PK & Legume	4-3	1.7	1.7	1.8	0.4	3.7	8.4	2.0	-1.0	1.1	-0.5	8.8	26.1	-0.3	-1.2	2.4	-0.3	2.7	4.2
L	P	6-2	-1.4	-1.7	-0.3	-1.7	-1.3	-0.6	0.3	4.7	-1.9	-2.1	8.4	17.1	-0.7	-1.5	0.9	1.2	0.5	1.9
L	PK	7-3	-1.1	-1.5	1.9	0.1	4.8	7.1	2.5	2.0	-1.7	-1.4	8.8	27.3	-0.5	-2.3	-0.8	-1.8	1.7	3.7
L	2NPK	8-4	-2.8	-2.8	1.0	0.1	3.5	3.5	0.2	4.2	-1.8	-2.2	1.7	1.0	1.5	1.4	-0.6	0.0	0.3	.6
K	PL	7-6	0.7	-0.2	3.0	3.4	10.2	12.8	4.7	2.3	1.3	2.8	4.6	19.0	.1	-1.2	0.1	0.2	3.1	4.9
2N	PKL & Leg.	8-7	0.0	0.4	0.9	0.4	2.4	4.8	-0.3	1.2	1.0	-1.3	1.7	-.2	1.7	2.5	2.6	1.5	1.2	1.2
Legume	NPKL	11-10	16.2	13.8	26.4	10.4	19.7	13.8	22.6	10.8	29.1	12.4	29.9	27.0	15.5	12.9	14.3	1.0	21.7	12.8
2K-K	N2PL	15-14	1.3	1.3	-1.0	-1.2	1.9	1.5	0.0	4.8	-0.3	-0.2	-0.1	0.1	-0.4	0.7	0.2	3.4	0.2	1.3
2P	N2KL	15-16	5.8	---	10.5	---	5.9	---	5.2	---	2.8	---	20.9	---	7.4	---	3.2	---	7.7	---
2NPKL	Legume	8-9	14.0	18.4	21.3	17.6	15.1	27.8	10.3	12.0	6.9	3.5	24.2	50.0	13.3	18.8	8.1	5.8	14.2	19.2

Rates of Fertilizer Materials

1930-48

P = 600# superphosphate per rotation - 200 to cotton, 400 to vetch
K = 75# Muriate per rotation - 25 to cotton, 50 to vetch
2N = 200# Sodium nitrate per rotation - 100 to cotton, 100 to corn
L = 2000# lime applied in 1930

1949-54

P = 800# superphosphate per rotation - 400 to cotton, 400 to vetch (Wiregrass 600# superphosphate per rotation)
K = 100# muriate per rotation - 50 to cotton, 50 to vetch (Aliceville, Prattville and Tennessee Valley 75# muriate per rotation)
(Brewton 150# muriate per rotation).
2N = 400# sodium nitrate per rotation- 200 to cotton, 200 to vetch

J. T. Cope

Table 1M Summary of Response of Winter Legumes to Treatments in the Two Year Rotation Fertilizer Experiment at Eight Locations 1930-54 (Summary of Tables 1C to 1L)

Response to:	With	Treatment	Increase in Pounds Green Weight of Winter Legume																	
			Alex.		Alice.		Brewton		Monroe.		Pratt.		Sand Mt.		Tenn. V		Wiregrass		Average	
			30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54	30-48	49-54
P	---	2-1	7817	8821	7669	8638	2080	4826	5878	6941	5342	9100	4102	2987	8279	11235	2714	849	5485	6675
K	P	3-2	340	600	1473	3762	1100	-133	1190	2481	2160	5121	1329	2800	380	1643	765	1121	1092	2174
2N	PK & Leg.	4-3	217	2533	-14	946	960	2002	413	1109	-154	1129	1393	5996	483	762	1220	-724	565	1719
L	P	6-2	516	3092	-83	-917	1202	2019	769	4917	486	2067	1775	3565	1358	1517	1468	38	936	2037
L	PK	7-3	1270	3717	379	488	3109	4208	3319	3982	20	671	3637	10308	1836	908	2253	-11	1978	3034
L	2NPK	8-4	593	371	220	-33	3433	4460	2483	1864	-404	-1267	2257	4833	1502	626	1663	-1257	1468	1200
K	PK	7-6	1094	1225	1935	5167	3007	2056	3740	1546	1694	3725	3191	9543	858	1034	1550	1072	2134	3171
2N	PKL & Leg.	8-7	-460	-813	-173	425	1284	2254	-423	-1009	-578	-809	13	521	149	480	630	-1970	55	-115
Legume	NPKL	11-10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2K-K	N2PL	15-14	185	-34	557	263	161	3379	711	1302	9	854	292	2355	124	-591	662	-1134	338	799
2P	N2KL	15-16	9820	---	9918	---	5108	---	9038	---	5579	---	8968	---	12325	---	4509	---	8158	---
2NPKL	Legume	8-9	9310	12204	8953	12846	7403	9141	9190	11216	5821	11933	7400	16078	10977	13975	5771	-1230	8103	10770

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Rates of Fertilizer Materials

1930-48

P = 600# superphosphate per rotation - 200 to cotton, 400 to vetch

K = 75# muriate per rotation - 25 to cotton, 50 to vetch

2N = 200# sodium nitrate per rotation - 100 to cotton, 100 to corn

L = 2000# lime applied in 1930

1949-54

P = 800# superphosphate per rotation - 400 to cotton, 400 to vetch (Wiregrass 600# superphosphate per rotation)

K = 100# Muriate per rotation - 50 to cotton, 50 to vetch (Alicevville, Prattville and Tennessee Valley 75# muriate per rotation) (Brewton 150# Muriate per rotation).

2N = 400# sodium nitrate per rotation - 200 to cotton, 200 to vetch.

J. T. Cope

Table 10 Summary of Yields of Cotton, Corn, and Winter Legumes in The Two Year Rotation Fertilizer Experiment At Eight Locations 1930-1954

Plot No.	Treatment1/	Alexandria	Aliceville	Dreuton	Monroeville	Prattville	Sand Mt.	Tenn Valley	Wiregrass	Average
		644(6)	678	326	472	774	689	1072	780	679
1	None	24.3(7)	22.7	26.7	28.4	33.8	24.0	31.3	25.7	27.1
		1731(8)	2481	2699	4177	5601	2532	2632	5862	3461
		977	1009	388	749	952	920	1480	1062	948
2	P	34.7	39.3	31.0	37.8	44.4	41.4	40.9	30.2	37.5
		9548	10150	4779	10055	10943	6634	10911	8576	8950
		1070	1238	841	1003	1147	1351	1535	1169	1169
3	PK	35.1	40.1	35.1	40.3	45.5	45.6	40.8	32.0	39.3
		9888	11623	5879	11245	13103	7963	11291	9341	10048
	2/	1204	1475	1139	1220	1397	1750	1562	1412	1395
4	2NPK	36.8	41.9	38.8	42.3	46.6	54.4	40.5	34.4	42.0
		10105	11609	6839	11658	12949	9356	11774	10561	10600
		530	690	271	546	832	775	1122	841	700
5	None	22.7	23.5	22.0	30.7	36.8	27.5	31.8	26.5	27.7
		1467	2899	2286	4450	6296	2941	2601	6049	3623
		926	758	315	778	997	916	1378	1120	899
6	PL	33.3	39.0	29.7	38.1	42.5	49.8	40.2	31.1	38.0
		10064	10067	5981	10824	11429	8409	12269	10044	9880
		1039	1206	964	1174	1250	1609	1466	1215	1240
7	PKL	34.0	42.0	39.9	42.8	43.8	54.4	40.3	31.2	41.3
		11158	12002	8988	14564	13123	11600	13127	11594	12020
	2/	1148	1436	1241	1375	1447	1879	1546	1450	1440
8	2NPKL	34.0	42.9	42.3	42.5	44.8	56.1	42.0	33.8	42.3
		10698	11829	10272	14141	12545	11613	13276	12224	12075
		448	648	307	553	891	1032	1061	845	723
9	None	20.0	21.6	27.2	32.2	37.9	31.9	28.7	25.7	28.2
		1388	2876	2869	4951	6724	4213	2299	6453	3972
	3/ 5/	859	1050	1023	1085	925	1445	1226	1133	1093
10	NPKL	15.2	13.4	19.0	19.7	13.1	20.4	22.5	16.9	17.5
	4/	1192	1431	1237	1425	1451	1913	1466	1407	1440
11	NPKL	31.4	39.8	38.7	42.3	42.2	50.3	38.0	31.2	39.2
		8771	10027	8196	12524	11751	9126	8382	10679	9932
		1114	1351	1073	1286	1411	1721	1408	1421	1348
12	N½PKL	33.6	40.8	37.4	41.9	44.0	49.8	38.0	32.6	39.8
		8544	9957	7529	12214	11852	9511	9480	11039	10016
		539	691	275	578	837	892	1135	876	728
13	None	22.3	24.8	21.4	31.7	37.0	29.9	33.1	26.8	28.4
		1720	3017	2001	4855	6391	3513	2888	6354	3842
		1284	1528	1134	1412	1450	1909	1610	1563	1486
14	N2PKL	34.1	41.9	39.0	42.7	42.6	54.9	41.7	34.4	41.4
		12005	12813	9519	15164	13679	12534	15154	12295	12895
		1331	1534	1452	1480	1466	2008	1604	1556	1554
15	N2P2KL	35.4	40.9	40.9	42.7	42.3	54.8	41.3	34.6	41.6
		12190	13370	9680	15875	13688	12826	15278	12957	13233
		902	1151	1188	1155	1292	1392	1267	1336	1210
16	N2KL	29.6	30.4	35.0	37.5	39.5	33.9	33.9	31.4	33.9
		2370	3452	4572	6837	8109	3858	2953	8448	5075
		605	654	303	525	744	707	982	780	663
17	None	23.5	21.1	24.6	29.8	31.7	24.9	27.1	26.9	26.2
		1612	2501	2138	4259	5296	2483	1723	6030	3255

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Table 1D Summary of Yields of Cotton, Corn, and Winter Legumes in The Two Year Rotation Fertilizer Experiment at Eight Locations 1949-54

Plot No	Treatment 1/	Alexandria	Alice-ville	Brewton	Monroeville	Prattville	Sand Mt.	Tenn Valley	Wiregrass 8/	Average
		830 (9)	402	127	433	742	334	700	833	550
1	None	21.0(10)	19.0	20.9	31.1	40.1	16.0	29.1	31.6	26.1
		2804(11)	2229	4372	4567	6275	1736	3212	3398	3574
		1181	809	489	867	991	600	1222	1257	927
2	P	34.1	35.5	37.1	46.0	45.5	35.3	52.5	30.3	39.5
		11625	10867	9198	11508	15375	4723	14447	4247	10249
		1242	981	876	1297	1430	1057	1310	1586	1222
3	PK	33.7	37.1	42.2	51.0	47.6	44.1	52.1	33.5	42.7
		12225	14629	9065	13989	20496	7523	16090	5368	12423
		1334	1165	1431	1556	1585	1524	1434	1708	1467
4	NPK	35.4	37.5	50.6	50.0	47.1	70.2	50.9	33.2	46.9
		14758	15575	11067	15098	21625	13519	16852	4644	14142
		1255	1118	1318	1472	1432	1416	1367	1407	1348
5	1½ NPK	31.9	36.1	41.6	50.4	42.9	66.1	49.1	31.2	43.7
		12682	13287	10125	14225	18217	10540	15954	4149	12397
		1202	731	521	1008	930	594	1163	1324	923
6	PL	32.4	33.8	36.5	50.7	43.4	52.4	51.0	31.5	41.5
		14717	9950	11217	16425	17442	8288	15964	4285	12286
		1330	1011	1114	1554	1469	1362	1260	1596	1337
7	PKL	32.2	37.2	49.3	53.0	46.2	71.4	49.8	31.7	46.4
		15942	15117	13273	17971	21167	17831	16998	5357	15457
		1370	1185	1754	1809	1595	1549	1394	1646	1538
8	NPKL	32.6	37.6	54.1	54.2	44.9	71.2	52.3	33.2	47.5
		15129	15542	15527	16962	20358	18352	17478	3387	15342
		602	442	229	604	880	511	765	891	616
9	None	14.2	20.0	26.3	42.2	41.4	21.2	33.5	27.4	28.3
		2925	2696	6386	5746	8425	2274	3503	4617	4572
	2/ 9/	1210	971	1572	1584	1428	1416	1183	1363	1341
10	NPKL	21.0	26.4	38.4	43.0	32.1	42.7	33.8	31.5	33.6
	3/	1434	1168	1627	1840	1549	1572	1400	1695	1536
11	NPKL	34.8	36.8	52.2	53.8	44.5	69.7	46.7	32.5	46.4
		14479	14454	12993	17997	19575	16135	14067	5347	14381
		1342	1129	1559	1708	1540	1473	1344	1673	1471
12	N½PKL	35.4	37.3	50.8	52.5	45.1	69.0	45.9	35.1	46.4
		13254	13600	11854	16212	18617	12851	13812	5532	13217
	4/ 9/	1257	1058	1252	1614	1411	1493	1352	1435	1359
13	2NPK	29.4	32.2	45.2	51.3	42.4	58.0	44.2	30.0	41.6
	5/	1278	1192	1448	1818	1540	1560	1497	1647	1498
14	N1½P3/4KL	35.7	36.1	53.9	52.2	43.7	75.4	45.8	32.0	46.9
		18146	16362	14539	19288	21842	18893	20374	6649	17012
	6/	1331	1168	1885	1850	1538	1620	1477	1523	1549
15	N1½P1½KL	37.0	34.9	55.4	57.0	43.5	75.5	46.5	35.4	48.2
		18112	16625	17918	20590	22696	21248	19783	5515	17811
	7/	1376	1094	1876	1713	1541	1515	1347	1516	1497
16	N1½P1½KL	36.7	36.6	53.7	57.4	44.0	74.5	45.3	35.0	47.9
		14250	15950	13876	17244	19825	16073	16435	4285	14742
		674	371	197	535	724	420	712	808	555
17	None	18.4	15.2	21.9	34.9	37.3	20.3	24.5	30.0	25.3
		2900	1900	5769	4490	4783	1793	3049	3605	3536

(Footnotes on Back)

1/ Basic Treatment is 400# nitrate of soda, 800# superphosphate and 100# of muriate of potash per acre per rotation. In general ½ of NPK is applied to cotton (all P & K at planting; ¼ N at planting and 3/4 as a sidedressing) and ½ of P & K is applied to Vetch in fall before corn and ½ N is applied to corn (¼ at planting and 3/4 as a sidedressing.) Ratesof K vary with location as noted in the tables for individual locations.

2/ All P & K to cotton - no legumes. N- ½ to corn and ½ to cotton.

3/ All P & K to cotton . N - ½ to corn and ½ to cotton.

4/ Cotton on plot 13 receives 600# super and 75# muriate and ½ N.
Corn on plot 13 receives 200# super and 25# muriate and ½ N.
No legume on this plot after 1948.

5/ Cotton receives 400# super and 25# muriate, Vetch receives 800# super and 50# muriate.

6/ Cotton receives 400# super and 50# muriate, Vetch receives 800# super and 100# muriate.

7/ Cotton receives 800# super and 100# muriate, Vetch receives 400# super and 50# muriate.

8/ Cotton and corn at Wiregrass are 5 year averages (1949-53.) while Blue Lupine is a 4 year average of 2 crops.

9/ No legumes on plots 10 and 13.

10/ Pound seed cotton per acre - First figure in each case.

11/ Bushels corn per acre - Second figure in each case.

12/ Pounds green weight of winter legume per acre - Third figure in each case.

Table 1E Yields of Cotton, Corn, and Winter Legumes in The Two-Year Rotation Fertilizer Experiment Alexandria Field 1930-54

Plot No.	Treatment [7]	Lbs/Acre to: Cotton	Corn [6]	Vetch	Corn 1930-36 [8]	Corn 1937-42	Corn 1943-48	Corn 1930-48	Cotton [4]	Corn or [3]	Vetch	Corn 1949-54
	$NaNO_3$				607 [10]	666	665	644				830
1	Super				23.5 [11]	24.5	25.1	24.3				21.0
	Muriate				2683 [12]	1394	1208	1731				2804
	$NaNO_3$				812	1104	1044	977				1181
2	Super	200	400		27.7	38.0	39.8	34.7	400	400		34.1
	Muriate				11721	8044	8879	9548				11625
	$NaNO_3$				856	1278	1111	1070				1242
3	Super	200	400		28.0	37.7	41.1	35.1	400	400		33.7
	Muriate	25	50		12806	8397	8463	9888	50	50		12225
	$NaNO_3$	100	100		931	1429	1297	1204	200	200		1334
4	Super	200	400		28.3	41.2	42.5	36.8	400	400		35.4
	Muriate	25	50		13030	8497	8789	10105	50	50		14758
	$NaNO_3$				493	547	556	530	400	200		1255
5	Super				21.6	22.7	24.2	22.7	400	400		31.9
	Muriate				2263	1015	1122	1467	50	50		12682
	$NaNO_3$ [1]				687	1081	1051	926				1202
6	Super	200	400		25.4	35.0	40.8	33.3	400	400		32.4
	Muriate				11292	8736	10163	10064				14717
	$NaNO_3$ [1]				730	1213	1228	1039				1330
7	Super	200	400		25.7	36.5	41.0	34.0	400	400		32.2
	Muriate	25	50		13265	9525	10679	11158	50	50		15942
	$NaNO_3$ [1]	100	100		805	1418	1280	1148	200	200		1370
8	Super	200	400		24.9	37.5	41.3	34.0	400	400		32.6
	Muriate	25	50		12970	9338	9786	10698	50	50		15129
	$NaNO_3$				415	448	485	448				602
9	Super				18.1	18.9	23.1	20.0				14.2
	Muriate				2021	993	1148	1388				2925
	$NaNO_3$ [1]	100	[5]		716	950	937	859	200	200		1210
10	Super	600			17.2	13.0	15.1	15.2	800			21.0
	Muriate	75			- [9]	- [9]	- [9]	- [9]	100			- [9]
	$NaNO_3$ [1]	100	[5]		840	1413	1379	1192	200	200		1434
11	Super	600			23.4	32.9	39.6	31.4	800			34.8
	Muriate	75			8599	7416	10298	8771	100			14479
	$NaNO_3$ [1]	100			809	1361	1223	1114	200	200		1342
12	Super	100	200		25.1	36.5	41.0	33.6	200	200		35.4
	Muriate	25	50		9475	7370	8787	8544	50	50		13254
	$NaNO_3$				513	527	579	539	400	400		1257
13	Super				19.6	22.8	25.3	22.3	600	[2]		29.4
	Muriate				2726	1152	1283	1720	75			- [9]
	$NaNO_3$ [1]	100			952	1580	1373	1284	200	200		1278
14	Super	400	800		26.7	37.0	38.6	34.1	400	800		35.7
	Muriate	25	50		14861	9925	11227	12005	25	50		18146
	$NaNO_3$ [1]	100			1002	1624	1423	1331	200	200		1331
15	Super	400	800		27.7	38.3	41.8	35.4	400	800		37.0
	Muriate	50	100		15128	10302	11138	12190	50	100		18112
	$NaNO_3$ [1]	100			738	1004	993	902	200	200		1376
16	Super				25.5	30.8	33.0	29.6	800	400		36.7
	Muriate	50	100		2788	1790	2531	2370	100	50		14250
	$NaNO_3$				569	609	646	605				674
17	Super				22.7	23.0	25.1	23.5				18.4
	Muriate				2578	1072	1186	1612				2900

FOOTNOTES:

1/ Plus one ton marble dust per acre March 1930 and one ton again in 1933. Limed in 1954.

2/ Corn on this plot also receives 200# super and 25# Muriate per acre.

3/ All P & K to legumes; all N to corn, 1/4 at planting and 3/4 as a sidedressing.

4/ All P & K and 1/4 N applied at planting and 3/4 N applied as a sidedressing at second cultivation of cotton.

5/ All minerals to cotton on these two plots.

6/ All P & K applied to vetch preceeding corn. All N to corn.

7/ 2/3 of P & K applied to vetch preceeding corn and 1/3 of P & K is applied directly to cotton.

8/ Six year average of vetch 1931-36.

9/ No legumes on plots 10 and 13 during this period.

10/ Pounds seed cotton per acre - First figure in each case.

11/ Bushels corn per acre - Second figure in each case.

12/ Pounds green weight of winter legume - Third figure in each case.

J. T. Cope, Jr.

Table 1F Yields of Cotton, Corn, and Winter Legumes in The Two-Year Rotation Fertilizer Experiment Aliceville Field 1930-54

Plot No.	Treatment	Lbs./Acre To Cotton	Lbs./Acre To Vetch	Yield Per Acre 1930-36	1937-42	1943-48	1930-48	Lbs./Acre To Cotton or Corn[6]	Lbs./Acre To Vetch[4]	Yield Per Acre 1949-54
1	$NaNO_3$			700 [8]	630	701	678			402
	Super			26.1 [9]	22.6	18.9	22.7			19.0
	Muriate			3871 [10]	1802	1538	2481			2229
2	$NaNO_3$			974	1079	981	1009			809
	Super	200	400	35.2	40.5	42.9	39.3	400	400	35.5
	Muriate			10760	8913	10675	10150			10867
3	$NaNO_3$			984	1312	1462	1238			981
	Super	200	400	35.2	41.7	44.3	40.1	400	400	37.1
	Muriate	25	50	12520	10221	11979	11623	50	25	14629
4	$NaNO_3$	100	100	1181	1606	1688	1475	200	200	1165
	Super	200	400	34.8	45.6	46.4	41.9	400	400	37.5
	Muriate	25	50	12201	10192	12338	11609	50	25	15575
5	$NaNO_3$			732	642	687	690	400	200	1118
	Super			26.6	22.9	20.3	23.5	400	400	36.1
	Muriate			4708	1979	1708	2899	50	25	13287
6	$NaNO_3$ [2]			698	821	777	758			731
	Super	200	400	33.0	42.2	43.1	39.1	400	400	33.8
	Muriate			10346	8671	11142	10067			9950
7	$NaNO_3$ [2]			945	1330	1386	1206			1011
	Super	200	400	35.3	45.2	47.0	42.0	400	400	37.2
	Muriate	25	50	12645	10531	12683	12002	50	25	15117
8	$NaNO_3$ [2]	100	100	1136	1607	1613	1436	200	200	1185
	Super	200	400	35.1	45.8	49.3	42.9	400	400	37.6
	Muriate	25	50	12608	10063	12688	11829	50	25	15542
9	$NaNO_3$			726	601	604	648			442
	Super			26.2	19.9	18.1	21.6			20.0
	Muriate			4769	2019	1525	2876			2696
10	$NaNO_3$ [2]	100		931	1029	1208	1050	200	200	971
	Super	600		17.6	13.0	8.9	13.4	800		26.4
	Muriate	75		- [7]	- [7]	- [7]	- [7]	75		- [7]
11	$NaNO_3$ [2]	100		1122	1589	1635	1431	200	200	1168
	Super	600		33.9	41.6	44.9	39.8	800		36.8
	Muriate	75		9788	8558	11779	10027	75		14454
12	$NaNO_3$ [2]	100		1069	1527	1351	200	200	200	1129
	Super	100	200	34.8	42.9	44.1	40.8	200	200	37.3
	Muriate	25	50	10318	8423	11071	9957	50	25	13600
13	$NaNO_3$			715	677	677	691	400	400	1058
	Super			28.2	24.7	21.2	24.8	600	[1]	32.3
	Muriate			4596	2371	1842	3017	50		- [7]
14	$NaNO_3$ [2]	100		1178	1739	1725	1528	200	200	1192
	Super	400	800	35.6	45.0	46.2	41.9	400	800	36.1
	Muriate	25	50	13337	11840	13175	12813	25	50	16362
15	$NaNO_3$ [2]	100		1188	1701	1769	1534	200	200	1168
	Super	400	800	36.6	44.2	43.5	40.9	400	800	34.9
	Muriate	50	100	14555	11573	13783	13370	50	100	16625
16	$NaNO_3$ [2]	100		1070	1192	1201	1151	200	200	1094
	Super			32.0	31.8	27.5	30.4	800	400	36.6
	Muriate	50	100	5768	2573	1633	3452	100	50	15950
17	$NaNO_3$			721	585	644	654			371
	Super			26.3	20.5	16.4	21.1			15.2
	Muriate			4154	1748	1325	2501			1900

FOOTNOTES:

1/ Corn on this plot also receives 200# Super and 25# Muriate in addition to the 400# $NaNO_3$ shown.

2/ Plus 1 Ton oyster shell dust April 1930, 1 Ton Dolomite 1954.

3/ All P & K and 1/4 N applied to cotton at planting and 3/4 N applied as a sidedressing at second cultivation of cotton.

4/ All P & K to legumes preceeding corn. All N applied to corn, 1/4 at planting and 3/4 as a sidedressing.

5/ 2/3 of P & K applied to vetch in fall preceeding corn, other 1/3 applied directly to cotton.

6/ All P & K applied to vetch preceeding corn, all N applied to corn.

7/ No legume on plots 10 and 13 during this period.

8/ Pounds seed cotton per acre - First figure in each case.

9/ Bushels corn per acre -- Second figure in each case.

10/ Pounds green weight of winter legumes - Third figure in each case.

J. T. Cope, Jr.

Table 16 Yields of Cotton, Corn and Winter Legumes in the two-Year Rotation Fertilizer Experiment, Brewton 1930-54

Plot No.	Treatment	Lbs. per Acre to: Cotton	Vetch or Corn	Yield per Acre 1930-36	1937-42	1943-48	1930-48	Lbs/Acre to Cotton	Vetch or Corn	1949-54
	$NaNO_3$		6/	437 10/	336	185	326	2/	3/	127
1	Super			30.0 11/	23.6	25.7	26.7			20.9
	Muriate			3389 12/	1467	3125	2699			4372
	$NaNO_3$			393	418	352	388			489
2	Super	200	400	31.7	28.3	33.3	31.0	400	400	37.1
	Muriate			4153	3739	6552	4779	50		9198
	$NaNO_3$			667	843	1038	841			876
3	Super	200	400	33.6	30.6	41.0	35.1	400	400	42.2
	Muriate	25	50	4532	4441	8890	5879	100	50	9065
	$NaNO_3$	100	100	956	1170	1318	1139	200	200	1431
4	Super	200	400	37.8	33.9	44.9	38.8	400	400	50.6
	Muriate	25	50	5523	5537	9683	6839	100	50	11067
	$NaNO_3$			275	315	227	271	400	200	1318
5	Super			21.5	20.0	25.0	22.0	400	400	41.6
	Muriate			1977	1571	3365	2286	100	50	10125
	$NaNO_3$ 1/			323	368	254	315			521
6	Super	200	400	29.7	28.5	31.4	29.7	400	400	36.5
	Muriate			7074	4743	5942	5981	50		11217
	$NaNO_3$ 1/			696	988	1255	964			1114
7	Super	200	400	41.5	35.0	43.2	39.9	400	400	49.3
	Muriate	25	50	10533	7552	8625	8988	100	50	13273
	$NaNO_3$ 1/	100	100	955	1339	1480	1241	200	200	1754
8	Super	200	400	42.3	38.2	46.3	42.3	400	400	54.1
	Muriate	25	50	11670	8890	10025	10272	100	50	15527
	$NaNO_3$			315	335	269	307			229
9	Super			29.4	22.9	28.7	27.2			26.3
	Muriate			2957	1733	3902	2869			6386
	$NaNO_3$ 1/	100		996	956	1120	1023	200	200	1572
10	Super 7/	600		23.4	16.2	17.0	19.0	800		38.4
	Muriate	75		--9/	--9/	--9/	--9/	150		--9/
	$NaNO_3$ 1/	100		1017	1256	1477	1237	200	200	1627
11	Super 8/	600		38.2	34.5	43.3	38.7	800		52.2
	Muriate	75		8843	7070	8567	8196	150		12993
	$NaNO_3$ 1/	100		782	1115	1370	1073	200	200	1559
12	Super	100	200	36.7	32.4	43.1	37.4	200	200	50.8
	Muriate	25	50	8827	5782	7754	7529	100	50	11854
	$NaNO_3$ 4/			237	313	279	275	400	400	1252
13	Super			21.5	18.0	24.5	21.4	600		45.2
	Muriate			1749	1236	3061	2001	100		--9
	$NaNO_3$ 1/	100		858	1186	1405	1134	200	200	1448
14	Super	400	800	40.0	36.0	40.9	39.0	400	800	53.9
	Muriate	25	50	9544	9492	9515	9519	25	50	14539
	$NaNO_3$ 1/	100		1200	1422	1781	1452	200	200	1885
15	Super	400	800	43.0	36.2	43.3	40.9	400	800	55.4
	Muriate	50	100	10966	9063	8798	9680	50	100	17918
	$NaNO_3$ 1/	100		1058	1162	1371	1188	200	200	1876
16	Super			38.1	30.3	36.2	35.0	800	400	53.7
	Muriate	50	100	6616	3455	3300	4572	100	50	13876
	$NaNO_3$			337	328	242	303			197
17	Super			28.2	22.2	23.1	24.6			21.9
	Muriate			2317	1635	2427	2138			5769

FOOTNOTES:

1/ 1 Ton oyster shell Oct. 1929 and 1 T. Dolomite 1939, 1 Ton dolomite in 1954.

2/ All P. & K applied at planting; 1/4 N at planting and 3/4 N as sidedressing.

3/ All P & K applied to legumes; N all to corn, 1/4 at planting and 3/4 as sidedressing.

4/ Corn on this plot (13) received 200# super and 25# Muriate at planting.

5/ Winter legumes is a 6-year average of 5 crops - failed in 1951.

6/ All P & K applied to legumes, all N to corn.

7/ No legumes on plot 10, all minerals for 2 years applied to cotton.

8/ All minerals applied to cotton - none to vetch preceeding corn.

9/ No legumes on plots 10 and 13 during this period.

10/ Pounds seed cotton per acre ----First figure in each case.

11/ Bushels corn per acre ----------Second figure in each case.

12/ Pounds green weight of winter legumes ---Third figure in each case.

J. T. Cope, Jr.

Table 1H Yields of Cotton, Corn, and Winter Legumes in The Two-Year Rotation Fertilizer Experiment - Monroeville Field 1930-50- 1954

Plot No.	Treatment 5/	Lbs. per Acre to: Cotton 6/	Vetch or Corn 7/	Yield Per Acre: 1930-36	1937-42	1943-48	1930-48	Lbs/Acre to Cotton 2/	Vetch or Corn 3/	1949-54
	$NaNO_3$			556 9/	480	365	472			433
1	Super			27.9 10/	24.0	33.3	28.4			31.1
	Muriate			4736 11/	2276	5427	4177			4567
	$NaNO_3$			793	712	736	749			867
2	Super	200	400	35.2	35.7	42.8	37.8	400	400	46.0
	Muriate			9415	7555	13299	10055			11508
	$NaNO_3$			1002	911	1098	1003			1297
3	Super	200	400	36.7	37.6	47.3	40.3	400	400	51.0
	Muriate	25	50	10075	7742	16112	11245	50	50	13989
	$NaNO_3$	100	100	1218	1136	1308	1220	200	200	1556
4	Super	200	400	38.4	40.6	48.5	42.3	400	400	50.0
	Muriate	25	50	10412	9197	15574	11658	50	50	15098
	$NaNO_3$			594	518	518	546	400	200	1472
5	Super			27.9	27.5	37.2	30.7	400	400	50.4
	Muriate			4891	2807	5577	4450	50	50	14225
	$NaNO_3$ 1/			804	766	759	778			1008
6	Super	200	400	35.6	36.2	43.0	38.1	400	400	50.7
	Muriate			9819	9426	13395	10824			16425
	$NaNO_3$ 1/			1082	1087	1367	1174			1554
7	Super	200	400	37.8	41.3	50.1	42.8	400	400	53.0
	Muriate	25	50	12419	12925	18704	14564	50	50	17971
	$NaNO_3$ 1/	100	100	1299	1295	1546	1375	200	200	1809
8	Super	200	400	37.6	40.5	50.3	42.5	400	400	54.2
	Muriate	25	50	12339	12542	17843	14141	50	50	16962
	$NaNO_3$			573	547	537	553			604
9	Super			30.0	29.0	38.1	32.2			42.2
	Muriate			5334	3500	5958	4951			5746
	$NaNO_3$ 1/	100		1147	937	1156	1085	200	200	1584
10	Super	600		20.2	16.7	20.5	19.7	800		43.0
	Muriate	75		8/	8/	8/	8/	100		8/
	$NaNO_3$ 1/	100		1387	1332	1514	1425	200	200	1840
11	Super	600		37.6	39.1	51.0	42.3	800		53.8
	Muriate	75		10855	10841	16157	12524	100		17997
	$NaNO_3$ 1/	100		1214	1218	1438	1286	200	200	1708
12	Super	100	200	37.5	40.1	48.9	41.9	200	200	52.5
	Muriate	25	50	10698	10864	15333	12214	50	50	16212
	$NaNO_3$			616	540	576	578	400	400	1614
13	Super			29.2	28.9	37.5	31.7	600	4/	51.3
	Muriate			4977	3132	6440	4855	75		8/
	$NaNO_3$ 1/	100		1312	1345	1593	1412	200	200	1818
14	Super	400	800	37.5	39.7	51.8	42.7	400	800	52.2
	Muriate	25	50	13137	14265	18429	15164	25	50	19288
	$NaNO_3$ 1/	100		1409	1363	1683	1480	200	200	1750
15	Super	400	800	38.2	38.6	52.3	42.7	400	800	57.0
	Muriate	50	100	14022	14756	19154	15875	50	100	20590
	$NaNO_3$ 1/	100		1234	1013	1206	1155	200	200	1713
16	Super			35.2	33.0	44.7	37.5	800	400	57.4
	Muriate	50	100	7681	4812	7876	6837	100	50	17244
	$NaNO_3$			555	532	480	525			535
17	Super			28.5	25.8	35.1	29.8			34.9
	Muriate			4375	10A 2695	5586	4259			4490

1/ All Super and Muriate applied to winter legumes. All $NaNO_3$ applied to corn.

2/ Plus 400 #/A calcium lime October 15, 1929, Limed in 1954.

3/ Soybeans in Corn from 1930-34.

4/ Two-thirds of P&K applied to vetch in fall preceeding cotton-other 1/3 applied directly to cotton.

5/ All minerals to cotton on plots 10 & 11

6/ Rate of muriate changed from 25 to 75 # in 1940.

7/ All minerals & 1/4 N applied at planting, 3/4 N as side dressing 2nd cultivation.

8/ No legumes on plots 10 and 13 during this period

9/ Pounds seed cotton per acre - First figure in each case.

10/ Bushels corn per acre -- Second figure in each case.

11/ Pounds green weight of winter legume -- Third figure in each case.

J. T. Cope, Jr.

Table 11 Yields of Cotton, Corn and Winter Legumes in The Two-Year Rotation Fertilizer Experiment - Prattville Field 1930-54

Plot No.	Treatment	Lbs/A to Cotton [5]	Lbs/A to Vetch or Corn [7]	Yield per acre 1930-36	Yield per acre 1937-42	Yield per acre 1943-48	Yield per acre 1930-48	Lbs/A to Cotton [2]	Lbs/A to Vetch or Corn [3]	Yield per acre 1949-54
1	$NaNO_3$			785[9]	746	789	774			742
	Super			27.3[10]	32.7	42.4	33.8			40.1
	Muriate			7018[11]	3896	5654	5601			6275
2	$NaNO_3$			906	1006	952	952			991
	Super	200	400	33.7	47.8	53.6	44.4	400	400	45.5
	Muriate			10138	10688	12138	10943			15375
3	$NaNO_3$			1018	1140	1305	1147			1430
	Super	200	400	34.7	48.6	54.8	45.5	400	400	47.6
	Muriate	25	50	11451	13625	14508	13103	50	25	20496
4	$NaNO_3$	100	100	1199	1427	1598	1397	200	200	1585
	Super	200	400	35.1	51.8	54.7	46.6	400	400	47.1
	Muriate	25	50	11323	13700	14096	12949	50	25	21625
5	$NaNO_3$			790	822	893	832	400	200	1432
	Super			29.6	36.6	45.3	36.8	400	400	42.9
	Muriate			7318	4725	6675	6296	50	25	18217
6	$NaNO_3$[1]			941	1101	958	997			930
	Super	200	400	31.9	46.2	51.0	42.5	400	400	43.4
	Muriate			10249	11473	12763	11429			17442
7	$NaNO_3$[1]			1072	1277	1431	1250			1469
	Super	200	400	32.1	47.2	54.0	43.8	400	400	46.2
	Muriate	25	50	11421	13279	14954	13123	50	25	21167
8	$NaNO_3$[1]	100	100	1229	1529	1619	1447	200	200	1595
	Super	200	400	33.7	48.5	54.2	44.8	400	400	44.9
	Muriate	25	50	11031	12338	14517	12545	50	25	20358
9	$NaNO_3$			838	841	1005	891			880
	Super			29.9	37.9	47.5	37.9			41.4
	Muriate			6939	5521	7675	6724			8425
10	$NaNO_3$[1]	100[6]		910	932	935	925	200[2]	200[3]	1428
	Super	600		15.2	12.2	12.0	13.1	800		32.1
	Muriate	75		[8]	[8]	[8]	[8]	75		[8]
11	$NaNO_3$[1]	100[6]		1220	1518	1657	1451	200	200	1549
	Super	100		32.3	43.6	52.8	42.2	800		44.5
	Muriate	75		10458	11613	13396	11751	75		19575
12	$NaNO_3$[1]	100		1204	1503	1562	1411	200	200	1540
	Super	100	200	33.2	45.5	54.9	44.0	200	200	45.1
	Muriate	25	50	10287	11688	13842	11852	50	25	18617
13	$NaNO_3$			788	831	902	837	400	400	1411
	Super			30.0	36.4	46.0	37.0	600[4]		42.4
	Muriate			7307	4800	6913	6391	50		[8]
14	$NaNO_3$[1]	100		1242	1542	1601	1450	200	200	1540
	Super	400	800	31.5	45.6	52.7	42.6	400	800	43.7
	Muriate	25	50	11972	14329	15021	13679	25	50	21842
15	$NaNO_3$[1]	100		1267	1540	1623	1466	200	200	1538
	Super	400	800	31.2	45.2	52.5	42.3	400	800	43.5
	Muriate	50	100	11590	13913	15912	13688	50	100	22696
16	$NaNO_3$[1]	100		1160	1283	1454	1292	200	200	1541
	Super			31.0	39.3	49.7	39.5	800	400	44.0
	Muriate	50	100	7799	7350	9229	8109	100	50	19825
17	$NaNO_3$			732	754	748	744			724
	Super			26.2	30.4	39.6	31.7			37.3
	Muriate			6700	3717	11A 5236	5296			4783

1/ Plus 1 ton oyster shells in fall 1929 and 1 ton dolomite in spring of 1933. 1 ton dolomite in 1954.

2/ All P & K and 1/4 N applied to cotton at planting and 3/4 N applied as a side-dressing at 2nd cultivation of cotton.

3/ All P & K to legumes. All N to corn, 1/4 at planting and 3/4 as a side-dressing.

4/ Corn on this plot receives 200# Super and 25# muriate at planting.

5/ 2/3 of P & K applied to vetch preceeding cotton and other 1/3 and all N applied to cotton at planting.

6/ All P, K, & N applied directly to cotton.

7/ All P & K applied to vetch preceeding corn and all N applied to corn.

8/ No legume on plots 10 and 13 during this period.

9/ Pounds per acre of seed cotton--First figure in each case.

10/ Bushels per acre of corn - Second figure in each case.

11/ Pounds green weight of winter legumes - Third figure in each case.

J. T. Cope, Jr.

Table 1J Yields of Cotton, Corn and Winter Legumes in the Two-Year Rotation Fertilizer Experiment - Sand Mountain Field 1940-1954

Plot No.	Treatment 4/	#/A to Cotton	#/A to Vetch or Corn 1/	Yield per Acre 1930-1936	1937-1942	1943-1948	1930-1948	Treatment	#/A to Cotton	#/A to Vetch or Corn	Yield per Acre 1949-1954
	$NaNO_3$			8052/	675	566	689	$NaNO_3$			334
1	Super			23.8 10/	23.2	25.5	24.0	Super			16.0
	Muriate			3542 11/	2127	1760	2532	Muriate			1736
	$NaNO_3$			1071	893	770	920	$NaNO_3$			600
	Super	200	400	37.2	39.8	47.7	41.4	Super	400	400	35.3
	Muriate			7442	6842	5486	6634	Muriate			4723
	$NaNO_3$			1292	1428	1345	1351	$NaNO_3$			1057
3	Super	200	400	38.6	40.8	58.2	45.6	Super	400	400	44.1
	Muriate	25	50	8805	7884	7059	7963	Muriate	50	50	7523
	$NaNO_3$	100	100	1635	1831	1802	1750	$NaNO_3$	200	200	1524
4	Super	200	400	46.1	51.6	67.0	54.4	Super	400	400	70.2
	Muriate	25	50	10110	9069	8747	9356	Muriate	50	50	13519
	$NaNO_3$			903	839	561	775	$NaNO_3$	400	200	1416
5	Super			27.9	27.7	26.9	27.5	Super	400	400	66.1
	Muriate			4079	2447	2106	2941	Muriate	50	50	10540
	$NaNO_3$ 2/			1150	887	681	916	$NaNO_3$			504
6	Super	200	400	42.2	49.6	58.7	49.8	Super	400	400	52.4
	Muriate			7693	9868	7787	8409	Muriate			8288
	$NaNO_3$ 2/			1541	1695	1602	1609	$NaNO_3$			1362
7	Super	200	400	45.0	52.8	67.2	54.4	Super	400	400	71.4
	Muriate	25	50	11743	12313	10720	11600	Muriate	50	50	17831
	$NaNO_3$ 2/	100	100	1831	1978	1843	1879	$NaNO_3$	200	200	1549
8	Super	200	400	47.7	55.2	67.3	56.1	Super	400	400	71.2
	Muriate	25	50	12189	11582	10973	11613	Muriate	50	50	18352
	$NaNO_3$			1166	1140	770	1032	$NaNO_3$			511
9	Super			33.4	29.8	32.2	31.9	Super			21.2
	Muriate			5823	3801	2748	4213	Muriate			2274
	$NaNO_3$ 2/	100 5/		1420	1465	1448	1445	$NaNO_3$	200	200	1416
10	Super	600		23.4	17.0	20.4	20.4	Super	800		42.7
	Muriate 6/	25		8/	8/	8/	8/	Muriate	100		8/
	$NaNO_3$ 2/	100 5/		1836	2002	1915	1913	$NaNO_3$	200	200	1572
11	Super	600		42.4	49.0	60.8	50.3	Super	800		69.7
	Muriate	75		8512	9068	9904	9126	Muriate	100		16135
	$NaNO_3$ 2/	100		1665	1320	1683	1721	$NaNO_3$	200	200	1473
12	Super	100	200	42.3	47.4	60.7	49.8	Super	200	200	69.0
	Muriate	25	50	9498	9312	9726	9511	Muriate	50	50	12851
	$NaNO_3$			1063	950	639	892	$NaNO_3$	400	400	1493
13	Super			30.7	29.3	29.7	29.9	Super	600		58.0
	Muriate			4960	3359	1981	3513	Muriate	75		8/
	$NaNO_3$ 2/	100		1834	1976	1932	1909	$NaNO_3$	200	200	1560
14	Super	400	800	47.1	54.3	64.5	54.9	Super	400	800	75.4
	Muriate	25	50	12626	13939	11024	12534	Muriate	25	50	18893
	$NaNO_3$ 2/	100		1917	2124	1999	2008	$NaNO_3$	200	200	1620
15	Super	400	800	46.7	54.5	64.8	54.8	Super	400	800	75.5
	Muriate	50	100	12252	14522	11801	12826	Muriate	50	100	21248
	$NaNO_3$ 2/	100		1576	1416	1150	1392	$NaNO_3$	200	200	1515
16	Super			33.7	33.6	34.9	33.9	Super	800	400	74.5
	Muriate	50	100	4979	3654	2754	3858	Muriate	100	50	16073
	$NaNO_3$			827	686	588	707	$NaNO_3$			420
17	Super			23.2	24.5	27.6	24.9	Super			20.3
	Muriate			3175	2337	1820	2483	Muriate			1793

FOOTNOTES:

1/ Plus one ton oyster shell dust October 1929 and one ton dolomite May 1933. One ton dolomite 1954.

2/ All P & K and 1/4 N applied to cotton at planting and 3/4 N as a sidedressing at second cultivation.

3/ All P & K to legumes in fall preceeding corn. All N to corn, 1/4 at planting and 3/4 as a sidedressing.

4/ Corn on Plot 13 receives 200# super and 25# Muriate/A at planting.

5/ 2/3 P & K applied to vetch in fall preceeding corn and other 1/3 P & K applied directly to cotton.

6/ All P, K, & N applied directly to cotton.

7/ All P & K applied to vetch in fall preceeding corn and all N applied directly to corn.

8/ No legumes on plots 10 and 13 during this period.

9/ Pounds seed cotton per acre --- First figure in each case

10/ Bushels corn per acre ---- Second figure in each case.

11/ Pounds green weight of winter legumes.---- Third figure in each case.

Table 2. Yields of Cotton, Corn, and Winter Legumes in The Two-Year Rotation Fertilizer Experiment - Tennessee Valley, 1930-54

Plot No.	Treatment	Cotton 6/	Vetch or Corn 7/	Yield per Acre: Cotton or Corn 1930-36 8/	Cotton or Corn 1937-42	Cotton or Corn 1943-48	Cotton or Corn 1930-48	Cotton 3/	Vetch or Corn 4/	Vetch or Corn 1949-54 5/
		Lbs/Acre						Lbs/Acre		
1	$NaNO_3$			1076 10/	1170	971	1072			700
	Super			29.0 11/	32.0	33.1	31.3			29.1
	Muriate			2936 12/	2568	2351	2632			3212
2	$NaNO_3$			1364	1555	1537	1480			1222
	Super	200	400	30.5	44.5	49.4	40.9	400	400	52.5
	Muriate			11502	11308	9828	10911			14447
3	$NaNO_3$			1369	1648	1617	1535			1310
	Super	200	400	29.4	43.5	51.7	40.8	400	400	52.1
	Muriate	25	50	11743	11426	10627	11291	50	25	16090
4	$NaNO_3$	100	100	1425	1708	1578	1562	200	200	1434
	Super	200	400	30.5	42.8	50.0	40.5	400	400	50.9
	Muriate	25	50	12918	12224	9992	11774	50	25	16852
5	$NaNO_3$			1060	1158	1158	1122	400	200	1367
	Super			27.5	33.5	36.3	31.8	400	400	49.1
	Muriate			3039	2087	2605	2601	50	50	15954
6	$NaNO_3$ 1/			1216	1522	1422	1378			1163
	Super	200	400	30.4	43.4	48.6	40.2	400	400	51.0
	Muriate			12330	13794	10672	12269			15964
7	$NaNO_3$ 1/			1304	1602	1523	1466			1260
	Super	200	400	30.5	44.0	48.3	40.3	400	400	49.8
	Muriate	25	50	12737	15219	11489	13127	50	225	16998
8	$NaNO_3$ 1/	100	100	1410	1671	1579	1546	200	200	1394
	Super	200	400	31.7	46.4	49.7	42.0	400	400	52.3
	Muriate	25	50	13260	16045	10527	13276	50	25	17478
9	$NaNO_3$			1020	1141	1026	1061			765
	Super			26.1	29.0	30.9	28.7			33.5
	Muriate			2718	1924	2187	2299			3503
10	$NaNO_3$ 1/	100		1139	1280	1268	1226	200	200	1183
	Super	600		28.3	19.6	19.0	22.5	800		33.8
	Muriate	75		9/	9/	9/	9/	75		9/
11	$NaNO_3$ 1/	100		1313	1623	1483	1466	200	200	1400
	Super	600		30.1	40.8	44.2	38.0	800		46.7
	Muriate	75		7731	9411	8113	8382	75		14067
12	$NaNO_3$ 1/	100		1241	1559	1452	1408	200	200	1344
	Super	100	200	28.7	41.4	46.3	38.0	200	200	45.9
	Muriate	25	50	8177	11843	8639	9480	50	25	13812
13	$NaNO_3$			1015	1221	1192	1135	300	400	1352
	Super			28.4	32.9	38.8	33.1	400		44.2
	Muriate			2773	2650	3258	2888	50		9/
14	$NaNO_3$ 1/	100		1412	1782	1667	1610	200	200	1497
	Super	400	800	31.6	46.5	48.9	41.7	400	800	45.8
	Muriate	25	50	15847	17551	11952	15154	25	50	20374
15	$NaNO_3$ 1/	100		1410	1788	1648	1604	200	200	1477
	Super	400	800	31.2	45.5	49.1	41.3	400	800	46.5
	Muriate	50	100	16384	17088	12179	15278	50	100	19783
16	$NaNO_3$ 1/	100		1184	1388	1239	1267	200	200	1347
	Super			28.7	34.9	39.3	33.9	800	400	45.3
	Muriate	50	100	3600	2396	2750	2953	100	50	16435
17	$NaNO_3$			1008	1058	873	982			712
	Super			26.4	26.8	28.7	27.1			24.5
	Muriate			2225	1334	1525	1723			3049

Plot No.	Treatment	6/ #/A to Cotton 7/	Vetch or Corn 8/	Yield per acre 1930-36	1937-42	1943-48	1930-48	#/A to Cotton 3/	Vetch or Corn 4/	1949-54 5/
18	Corn and cotton rotate every other year			764 2/ 22.8 2/ 2069 2/						476 2/ 18.4 2/ 2704 2/

1/ Plus two tons of calcium limestone applied October 1, 1929 and again in 1954.

2/ Three year average - corn and cotton rotate on Plot 18.

3/ All P & K applied to cotton before planting, 1/4 N at planting and 3/4 at 2nd cultivation.

4/ All P & K applied to winter legumes except Plot 13 which receives 200# super and 25# muriate to corn at planting. All N to corn, 1/4 at planting and 3/4 as a sidedressing.

5/ Corn is a 5-year average of 5 crops - not harvested in 1954.

6/ 2/3 of P & K applied to vetch in fall and other 1/3 applied to cotton.

7/ All minerals applied to cotton (P, K & N)

8/ All P & K applied to vetch preceeding corn. All N applied to corn.

9/ No legumes on plots 10 and 13 during this period

10/ Pounds seed cotton per acre -- First figure in each case.

11/ Bushels corn per acre --- Second figure in each case.

12/ Pounds green weight of winter legumes -- Third figure in each case.

J. T. Cope, Jr.

Table 1L Yields of Cotton, Corn and Winter Legumes in The Two-Year Rotation Fertilizer Experiment - Wiregrass Substation 1930-54

Plot No.	Treatment[8]	Lbs/A to Cotton[9]	Lbs/A to Lupine or Corn[10]	Yield Per Acre 1930-1936	1937-1942	1943-1948	1930-1948	Lbs/A to Cotton[1]	Lbs/A to Lupine or Corn[2]	1949-1953[6]
1	$NaNO_3$			918[13]	708	692	780			833
	Super			20.9[14]	23.2	33.7	25.7			31.6
	Muriate			3183[15]	3899	10948	5862			3398
2	$NaNO_3$			1066	1084	1034	1062			1257
	Super	200	400	22.5	33.7	35.8	30.2	300	300	30.3
	Muriate			5462	10389	10396	8576			4247
3	$NaNO_3$			1112	1213	1190	1169			1586
	Super	200	400	23.0	36.3	38.3	32.0	300	300	33.5
	Muriate	25	50	5032	10651	13057	9341	75		5368
4	$NaNO_3$	100	100	1358	1451	1435	1412	200	200	1708
	Super	200	400	25.7	40.3	38.8	34.4	300	300	33.2
	Muriate	25	50	6208	12131	14870	10561	75		4644
5	$NaNO_3$			954	826	724	841	12# N[3]	12# N[3]	1407
	Super			20.0	27.4	32.8	26.5	300	300	31.2
	Muriate			3448	4933	10200	6049	75	75	4149
6	$NaNO_3$[7]			1111	1204	1046	1120			1324
	Super	200	400	21.6	38.3	35.3	31.1	300	300	31.5
	Muriate			6571	14023	10117	10044			4285
7	$NaNO_3$[7]			1105	1277	1330	1215			1596
	Super	200	400	21.5	36.5	37.1	31.2	300	300	31.7
	Muriate	25	50	6910	16350	12302	11594	75		5357
8	$NaNO_3$[7]	100	100	1360	1526	1479	1450	200	200	1646
	Super	200	400	23.5	40.4	39.0	33.8	300	300	33.2
	Muriate	25	50	7996	15831	13551	12224	75		3387
9	$NaNO_3$			915	814	794	845			3891
	Super			19.1	25.3	33.6	25.7			27.4
	Muriate			4067	5307	10382	6453			4617
10	$NaNO_3$[7]	100	[11]	1208	1136	1044	1133	200	200	1363
	Super	600		17.5	15.3	18.0	16.9	300	300	31.5
	Muriate	75		[12]	[12]	[12]	[12]	75		[12]
11	$NaNO_3$[7]	100	[11]	1340	1471	1421	1407	200	200	1695
	Super	600		21.0	36.9	37.5	31.2	300	[5]	32.5
	Muriate	75		7095	13584	11957	10679	75		5347
12	$NaNO_3$[7]	100		1342	1515	1420	1421	200	200	1673
	Super	100	200	21.8	39.9	38.1	32.6	150	150	35.1
	Muriate	25	50	6695	14604	12542	11039	75		5532
13	$NaNO_3$			957	882	777	876	48# N[4]	48# N[4]	1435
	Super			19.7	28.2	33.7	26.8	300	300	30.0
	Muriate			3584	5693	10247	6354	75	75	[12]
14	$NaNO_3$[7]	100		1407	1669	1640	1563	200	200	1647
	Super	400	800	24.1	41.3	39.5	34.4	600	600	32.0
	Muriate	25	50	8287	16698	12567	12295	75		6649
15	$NaNO_3$[7]	100		1444	1645	1598	1556	200	200	1523
	Super	400	800	24.4	41.5	39.6	34.6	600	600	35.4
	Muriate	50	100	8242	18005	13409	12957	75	75	5515
16	$NaNO_3$[7]	100		1329	1378	1301	1336	200	200	1516
	Super			23.8	34.5	37.3	31.4	600	600	35.0
	Muriate	50	100	5653	8904	11253	8448	75	75	4285
17	$NaNO_3$			885	718	719	780			808
	Super			21.3	25.3	35.3	26.9			30.0
	Muriate			3220	4944	10393	6030			3605

1/ All P & K applied to cotton at planting - 1/4 N at planting and 3/4 sidedressing

2/ All P & K applied to legumes. N applied to corn. 1/4 at planting and 3/4 as a sidedressing.

3/ 12# of N from Sulfate of Ammonia (58.5#/A.) applied with P & K on plot 5.

4/ 12# of N from Sulfate of Ammonia (58.5#/A.) applied with P & K on plot t and 36# N from Nitrate of Soda (225#/A) applied as a sidedressing on plot 13.

5/ Lupine preceeding corn fertilized with 300# super/A.

6/ Cotton and corn are 5-year averages while lupine is a 4-year average of two crops

7/ One ton dolomite/Acre applied October 1929 and again in 1953.

8/ Basic treatment is 600# of superphosphate, 75# of muriate and 100# of nitrate of soda per acre. In general, 2/3 of P & K applied to vetch in fall on cotton plots and the 1/3 applied directly to cotton.

9/ All P & K applied to cotton at planting, all N to cotton also.

10/ All P & K applied to winter legumes, all N to corn.

11/ All NPK for 2 years applied to cotton.

12/ No legume on plots 10 and 13 during this period.

13/ Pounds seed cotton per acre - First figure in each case.

14/ Bushels corn per acre -- Second figure in each case.

15/ Pounds green weight of winter legumes -- Third figure in each case.

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Table 2A Response of Cotton and Corn in a two-Year Rotation to N, P_2O_5, and K_2O in Fertilizer

Formula Experiment No I at Eight Locations 1930-43

Treatment	Plots	14 Year Average Increase: Alexandria	Alice-ville	Brow-ton	Monroe-ville	Pratt-ville	Sand Mt.	Tenn. Valley	Wire-grass	Pounds Seed Cotton and Bu. Corn/A: Average 1930-43
1st 12# N	3-2	260	252	284	275	304	307	165	285	267
		7.6	7.3	8.4	8.8	9.1	8.3	5.6	7.3	7.8
2nd 12# N	4-3	161	185	184	177	205	315	176	175	197
		6.7	8.5	7.6	7.5	9.7	10.9	6.1	5.8	7.9
3rd 12# N	5-4	115	192	110	174	203	274	55	148	159
		4.9	7.3	4.7	5.4	7.6	10.1	3.8	3.6	5.9
4th 12# P_2O_5	10-11	84	25	118	15	3	24	27	42	42
		0.7	0.7	0.6	0.2	0.0	0.1	0.4	1.2	0.5
5th 12# P_2O_5	9-10	3	16	74	85	11	17	4	-25	23
		0.3	0.1	0.7	-0.5	-0.2	0.2	-0.5	1.7	0.2
2nd 12# K_2O	5-6	11	81	146	78	14	162	-2	52	68
		-0.1	-0.8	1.1	0.4	-0.4	0.5	-0.7	1.1	0.1
3rd 12# K_2O	8-9	17	15	-11	-11	9	7	-22	57	8
		1.0	0.4	-1.6	0.1	-0.1	0.1	-0.8	1.2	0.0
		Increase per Pound of N By Increments								
1st 12#N		21.7	21.0	23.7	22.9	25.3	25.6	13.8	23.8	22.3
		0.63	0.61	0.70	0.73	0.76	0.69	0.47	0.61	0.65
2nd 12#N		13.4	15.4	15.3	14.8	17.1	26.3	14.7	14.6	16.4
		0.56	0.71	0.63	0.63	0.81	0.91	0.51	0.48	0.66
3rd 12#N		9.6	16.0	9.2	14.5	16.9	22.8	4.6	12.3	13.3
		0.41	0.61	0.39	0.45	0.63	0.84	0.32	0.30	0.49
36# N		14.9	17.5	16.1	17.4	19.8	24.9	11.0	16.9	17.3
		0.53	0.64	0.58	0.60	0.73	0.81	0.43	0.46	0.60

Summary: All 8 locations produced a response to 36 over 24 pounds of nitrogen on both cotton and corn. The average response from this third 12 pounds of nitrogen was 159 pounds of seed cotton and 5.9 bushels of corn.

The average response per pound of N for 36 pounds was 17.3 pounds of seed cotton and 0.6 bushels of corn.

Average response of cotton to 48 P_2O_5 over 36 P_2O_5 was 42 pounds seed cotton. Only 2 locations produced response of more than 25 pounds of seed cotton to 60 P_2O_5 over 48 P_2O_5.

Average response of cotton to 24 K_2O over 12 K_2O was 68 pounds of seed cotton. Only one location produced response of more than 25 pounds of seed cotton to 36 K_2O over 24 K_2O.

Corn did not respond to more than 36 P_2O_5 or to more than 12 K_2O at any location.

The lack of response of both cotton and corn to P_2O_5 and K_2O was most likely due to the limited supply of nitrogen, 36 pounds, which these plots received.

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Table 2B Yields of Cotton and Corn in Fertilizer Formula Experiment No. 1 at Eight Locations 1930-43
Two Year Rotation of Cotton and Corn

Plot No.	Treatment: 600#/A Basis	14 year Average Yield Pounds Seed Cotton and Bu. Corn/A: Alex-andria	Alice-Ville	Brewton	Monroe-ville	Pratt-ville	Sand Mt.	Tenn. Valley	Wire-grass	Average
1	6-10-4	1110 33.9	1013 28.2	1385 38.4	1053 30.9	1158 34.9	1540 35.9	1656 39.5	1555 31.5	1309 34.2
2	0-10-4	519 12.9	472 7.1	540 14.5	420 10.9	460 8.4	619 7.6	1191 22.7	971 17.8	649 12.7
3	2-10-4	779 20.5	724 14.4	824 22.9	695 19.7	764 17.5	926 15.9	1356 28.3	1256 25.1	916 20.5
4	4-10-4	940 27.2	909 22.9	1008 30.5	872 27.2	969 27.2	1241 26.8	1532 34.4	1431 30.9	1113 28.4
5	6-10-4	1055 32.1	1101 30.2	1118 35.2	1046 32.6	1172 34.8	1515 36.9	1587 38.2	1579 34.5	1272 34.3
6	6-10-2	1044 32.2	1020 31.0	972 34.1	968 32.2	1158 35.2	1353 36.4	1589 38.9	1527 35.6	1204 34.5
7	To Cotton 6-10-4 To Corn 6-0-0	1043 33.3	1044 30.3	1038 31.8	987 32.4	1147 34.3	1364 35.3	1511 38.4	1603 34.3	1217 33.8
8	6-10-6	1125 34.4	1123 31.8	1267 35.8	1051 31.8	1176 34.9	1447 35.7	1611 39.4	1606 33.6	1301 34.7
9	6-10-4	1108 33.4	1108 31.4	1278 37.4	1062 31.7	1167 35.0	1440 35.6	1633 40.2	1549 32.4	1293 34.6
10	6-8-4	1105 33.1	1092 31.3	1204 36.7	977 32.2	1156 35.2	1423 35.4	1629 40.7	1574 34.1	1270 34.8
11	6-6-4	1021 32.4	1067 30.4	1086 36.1	962 32.0	1153 35.2	1399 35.3	1602 40.3	1532 32.9	1228 34.3
12	4-8-4	893 26.3	914 24.2	1008 30.8	848 27.1	974 30.1	1172 25.2	1539 35.7	1410 29.0	1095 28.6
13	6-10-4	1068 31.7	1079 31.0	1160 35.5	1024 32.4	1175 35.6	1467 35.9	1621 38.6	1543 32.2	1267 34.1
14	3-8-5	811 22.8	819 19.3	892 27.0	748 23.1	842 23.2	1013 19.6	1477 32.3	1270 26.3	984 24.2
15	3-10-3	872 23.7	826 19.7	873 26.9	754 22.3	851 23.0	1030 19.6	1506 32.5	1253 26.6	996 24.3
16	Treatment changed during course of experiment; therefore, no yields given for this plot.									
17	6-10-4	1130 33.2	1079 30.0	1285 38.0	988 31.5	1167 35.4	1470 35.1	1714 39.5	1566 31.0	1300 34.2

Table 3A Summary of Fertilizer formula experiment No 2 on Continuous Cotton

Average response at 7 Locations 1935-53[1]

Treatment	All yields and increases in pounds of seed cotton per acre							
	Alice-ville	Brow-ton	Monroe-ville	Pratt-ville	Tenn. Valley	Sand Mt.	Wire-grass	Average
Average Yield 1935-45								
No fertilizer	501	319	163	363	815	751	531	492
Increase of 300 # fertilizer over no fertilizer (1935-45)								
9-10-4	570	595	387	677	427	672	519	549
6-10-4	519	517	407	531	368	542	498	482
6-8-4	535	527	322	602	400	555	413	479
6-6-4	529	445	352	490	370	576	410	453
3-8-5	404	430	397	351	268	388	291	360
6-8-3	422	496	354	540	381	630	455	468
Increase of 600# fertilizer over 300# (1935-45)								
9-10-4	308	374	298	346	38	433	284	298
6-10-4	268	313	268	325	113	405	260	279
6-8-4	299	306	295	268	112	396	288	281
6-6-4	284	398	257	316	89	392	275	286
3-8-5	202	177	272	202	163	313	338	224
6-8-3	229	260	186	316	83	369	338	255
Increase of 900# fertilizer over 600# (1946-53)								
9-10-8	85	56		-12	-35	139	-61	25
6-10-8	123	54		67	-5	168	65	75
6-8-8	118	208		78	25	111	38	97
9-12-8	38	-78		-60	-51	116	-44	-17
9-10-4	45	83		92	-42	40	-77	19
9-10-12	24	150		3	-1	82	-54	33
Average of plots 1, 5, 9, 13 and 17 1946-53								
12-10-8[2]	1068	1230		1185	1169	1304	878	1129

This experiment was discontinued at all locations in 1953.

1/ The fertilizer treatments for the period 1935-45 are as shown in Table B. The fertilizer treatments (formula and rate) were changed in 1946 as shown in Table C. Each treatment was in duplicate.

2/ Check plots received 600 pounds of 12-10-8.

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Table 3B FORMULA EXPERIMENT NO. 2 ON CONTINUOUS COTTON

Average Results at Seven Locations, 1935-45

Treatment No.	Treatment: Formula	Lbs/A	Yield seed cotton per acre -- pounds: Alico-ville	Brew-ton	Monroe-ville 1/	Pratt-ville	Tenn. Valley	Sand Mt.	Wire-grass	Average
1	None	---	477	297	161	345	825	724	520	478
2	9-10-4	600	1379	1288	848	1386	1280	1856	1334	1339
3	9-10-4	300	1071	914	550	1040	1242	1423	1050	1041
4	6-10-4	600	1288	1140	838	1219	1296	1698	1289	1253
5	None	---	496	296	174	353	819	727	546	487
6	6-10-4	300	1020	827	570	894	1186	1293	1029	974
7	6-8-4	600	1335	1152	780	1233	1327	1702	1232	1252
8	6-8-4	300	1036	846	485	965	1215	1306	944	971
9	none	---	550	358	119	363	823	771	499	498
10	6-6-4	600	1314	1153	772	1169	1280	1719	1216	1231
11	6-6-4	300	1030	755	515	853	1191	1327	941	945
12	3-8-5	600	1107	917	732	916	1246	1452	1160	1076
13	None	---	481	330	183	356	809	758	511	490
14	3-8-5	300	905	740	560	714	1083	1139	822	852
15	6-7-3	600	1152	1075	703	1219	1279	1750	1324	1215
16	6-7-3	300	923	815	517	903	1196	1381	986	960
17	None	---	503	316	179	400	797	774	580	507
Ave of Cks 1,5,9,13,&17		---	501	319	163	363	815	751	531	492

1/ Discontinued at Monroeville after 1943 crop.

Table 30 Fertilizer Formula No. 2 on Continuous Cotton
1946-53 - Average Response at 7 Locations

Treatment No.	Treatment 1/	#/A	Alice-ville	Brew-ton	Pratt-ville 2/	Tenn. V.	Sand Mt. 2/	Wire-grass	Ave All. Locations
1	12-10-8	600	1045	1212	1172	1075	940	887	1055
2	9-10-8	600	1203	1281	1258	1314	1328	993	1224
3	9-10-8	900	1288	1337	1246	1279	1467	932	1249
4	6-10-8	600	1094	1118	1128	1289	1359	910	1141
5	12-10-8	600	1074	1174	1190	1207	1345	909	1139
6	6-10-8	900	1217	1172	1195	1283	1527	975	1216
7	6-8-8	600	1100	1019	1173	1273	1387	898	1129
8	6-8-8	900	1218	1227	1251	1298	1498	936	1226
9	12-10-8	600	1127	1368	1172	1204	1409	892	1187
10	9-12-8	600	1206	1227	1261	1326	1569	955	1243
11	9-12-8	900	1244	1149	1201	1275	1685	911	1226
12	9-10-4	600	1129	1049	1227	1284	1584	840	1166
13	12-10-8	600	1078	1155	1168	1180	1402	854	1126
14	9-10-4	900	1174	1132	1319	1242	1624	763	1185
15	9-10-12	600	1194	1264	1293	1351	1657	962	1270
16	9-10-12	900	1218	1414	1295	1350	1739	908	1303
17	12-10-8	600	1016	1242	1221	1177	1423	850	1140
18 3/	9-10-8	1200					1901		
19 3/	9-10-8	600					1783		
20 3/	9-10-8	900					1841		
21 3/	12-10-8	600					1239		

1/ All fertilizer applied before planting except plots 1, 5, 9, 13 and 17; on these plots 4-10-8 under and 8-0-0 as a side dressing.

2/ Average at Prattville and Sand Mountain is from 1946-51, 6-year average.

3/ Plots 18-21 at Sand Mountain are 6 year averages 1946-51.

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Table4 The Yields of Cotton and Corn in Formula and Rates of Fertilization Experiment at Sand Mountain Substation. Revised 1944

Rate of Application and Formula		Plot	Yield-11 year average 1944-1954	
Rate per acre: Formula			Cotton (lbs.)	Corn (Bushels)
Pounds: Cotton	Corn			
600	6-8-6	6-4-3	Ave. 1,5, 13 & 17	1330	32.9
900	9-8-6 1/	12-0-0 2/	2	1770	66.1
900	9-8-6 1/	9-0-0 2/	3	1755	60.8
900	9-8-6 1/	6-0-0 2/	4	1756	50.2
900	6-8-6	6-4-3	6	1569	46.6
1200	6-8-6	6-4-3	7	1718	57.6
1500	6-8-6	6-4-3	8	1822	63.6
600	9-8-6	9-4-3	9	1553	47.4
900	9-8-6	9-4-3	10	1762	62.0
1200	9-8-6	9-4-3	11	1841	68.6
1500	9-8-6	9-4-3	12	1843	71.2
1200	9-8-4	9-4-2	14	1847	68.9
1200	9-8-8	9-4-4	15	1843	67.6
1200	9-12-8	9-6-4	16	1864	68.7

The crops are grown in a 2-year rotation of cotton-corn.

1/ Cotton received a 9-12-6 in 1944 and 1945

2/ Corn received a 9-6-3 in 1944 and 1945

CONCLUSIONS:

The dominant factor in cotton and corn yields was nitrogen. If we average the results on the basis of nitrogen they are as follows:

Lbs. N	Cotton	Corn
36	1330	32.9
54	1561	48.1
72	1718	57.6
81	1761	61.4
90	1822	63.6
108	1849	68.0
135	1843	71.2

However, in all instances there was sufficient phosphorous and potash present There was no effect on corn yields from omitting phosphorous and potash in a corn fertilizer when corn followed cotton that had been liberally fertilized with phosphorous and potash.

Table 5 Effect of N, P, K, and Lime on 10 Different crops* at Tuskegee
10 Yeaf Average 1939-48

Plot No.	Fertilizer 1/	Sagrain		Sorghum		Corn	Spanish Peanuts		Runner Peanuts		Sweet Potatoes	Cowpeas	Cowpea Hay		Soybean Hay		Soybean
		Seed Heads #/A	Stalks #/A 2/	Heads #/A 3/	Stalk #/A	Bu/A 4/	Nuts #/A	Vines #/A	Nuts #/A	Vines #/A	#/A	Seed 6/ #/A	Green Wt. 5/ #/A	Dry Wt. 5/ #/A	Green Wt. #/A	Dry Wt. #/A	Seed #/A
1;7,13	0	436	3234	267	4386	10.1	579	989	685	1509	2883	500	6737	1412	5079	1615	296
2; 8,	P	598	4482	404	7984	12.2	612	1126	688	1826	3076	450	10646	2328	6111	1934	328
3; 9	PK	680	4192	561	7894	10.8	670	1298	802	1972	4076	550	12214	2624	6510	2040	379
4; 10	NPK	1660	7282	1133	17246	27.8	1143	1874	1082	3044	6128	650	15874	3240	11851	3666	627
5; 11	NPKL	1941	7383	1314	21309	35.4	1328	2118	1153	3530	6236	1050	18070	3638	13702	4262	918
6, 12	1/2(NPK)	1064	5429	540	10112	20.0	838	1418	960	2270	4825	850	12122	2554	8548	2624	456
	Relative Yield Percentage based on NPKL Plots 5 and 11 as 100																Ave.
1; 7, 13	0	22.5	43.8	20.3	20.6	28.5	43.6	46.7	59.4	42.7	46.2	47.6	37.3	38.8	37.1	37.9	32.2	37.8
2; 8	P	30.8	60.7	30.7	37.5	34.5	46.1	53.2	59.7	51.7	49.3	42.9	58.9	64.0	44.6	45.4	35.7	46.6
3; 9	PK	35.0	56.8	42.7	37.0	30.5	50.5	61.5	69.6	55.9	65.4	52.4	67.6	72.1	47.5	47.9	41.3	52.1
4; 10	NPK	85.5	98.6	86.2	80.9	78.5	86.1	88.5	93.8	86.2	98,3	61.9	87.8	89.1	86.5	86.0	68.3	85.1
5; 11	NPKL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
6, 12	1/2(NPK)	54.8	73.5	41.1	47.5	56.5	63.1	66.9	83.3	64.3	77.4	81.0	67.1	70.2	62.4	61.6	49.7	63.8

1/ Fertilizer on basis of 600# 6-10-4 per acre.
N= 225# sodium nitrate (75# before planting, 150 pounds 30-40 days after planting)
P= 375# Superphosphate (all before planting)
K= 50 # muriate of Potash (all before planting)
L= 500# dolomite (applied in lay-off furrow and thoroughly mixed with soil before planting.)

2/ 5 year average of stalks.

3/ 2 year average of 2 crop, 1947-48
4/ 9 year average of 9 crops - cows destroyed in 1948
5/ 9 year average of 9 crops
6/ 1 year's results only, 1948
* No regular sequence of crops in this experiment

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Table 6 Effect of N,P,K, and Lime on Oats, Corn, Kobe Lespedeza, and Soybean Hay in a 4 year Rotation* at Tuskegee

Ave. 1942-48

Plot No	Fertilizer2/ Oats	Fertilizer2/ Corn	Oats Bu/A	Corn7/ Bu/A	Kobe Lespedesa1/4/ Green Wt. #./A	Kobe Lespedesa1/4/ Dry Wt. #/A	Kobe Lespedesa5/ Green Wt. #/A	Kobe Lespedesa5/ Dry Wt. #/A	Soybean Hay6/ Green Wt. #/A	Soybean Hay6/ Dry #/A
1, 7, 13	0	0	14.1	11.6	3013	1134	2786	1049	4824	147(
2, 8	N	0	34.4	14.0	4128	1548	3374	1274	4900	149?
3,9	NP	P	49.7	13.4	4833	1817	3949	1483	4822	145?
4,10	NPK	PK	51.3	15.8	5555	2093	4230	1587	5728	173?
5,11	NPKL3/	PKL3/	55.0	14.6	6110	2298	4258	1600	9707	292?
6,12	NPK2L	PK	49.7	15.1	4868	1832	4044	1510	6522	198?

* Cropping system: Oats, lespedeza, lespedeza, corn, soybeens.

1/ Lespedeza on oat strips

2/ All minerals applied at planting. Sodium Nitrate applied March 1-10. Lime applied broadcast in fall of 1941 to all limed plots; N = 225 # sodium Nitrate P= 375# 16% superphosphate. K= 50# muriate of potash per acre.

3/ Broadcast one ton dolomite per acre and disk in on plots 5 and 11 in fall of 1941 and again at beginning of second or third rotation (1945 or 1949).

4/ 7 year ave. of 5 crops. Failed in 1942 and killed by dry weather in 1948.

5/ 7 year ave. of 4 crops (same as footnote 4 plus plowed up through error in 194

6/ 7 year ave. of 6 crops. Killed by dry weather in 1948.

7/ 4 year ave. of 3 crops (1943,44, and 45). Corn failed in 1942. Failed to get stand in 1946 and 1947. Sagrain was used in 1946 and Hegari in 1947 in place of corn.

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Table 7 Rate of Fertilizing Cotton

Prattville 1934-35

Treatment	1934-47	1938-41	1942-45	1946-49	1950-54	Ave.34-54
None	908	544	423	190	480	508
600# 6-0-0	1335	1394	1280	724	1074	1157
300# 6-10-4	1115	1210	1095	573	1004	1000
600# 6-10-4	1424	1777	1555	902	1260	1378
900# 6-10-4	1527	2123	1854	1031	1285	1551
None	683	541	407	128	305	408

SUMMARY: A large response to nitrogen has been produced since the beginning of this experiment. There has also been a consistent response to P and K but the response to these elements cannot be separated. The 900 pound rate of 6-10-4 has been better than 600 pounds but the difference between these treatments has been less in recent years than formerly. This may have been a result of lower yields due to less favorable weather in the last few years.

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Table 8 Rates of Sidedressing Sodium Nitrate to Cotton

Prattville Field

Pounds of sodium nitrate sidddressed:	Yield in pounds of seed cotton per acre					
	1949	1950	1951	1952	1953	1949-53
100	1450	1315	1418	1111	1164	1337
200	1591	1234	1315	1063	1116	1314
300	1703	1358	1476	1027	1265	1440

All plots received 600 pounds per acre of 4-10-7 before planting.

Conclusions

No explanation is offered for the variable results.

C. E. Scarsbrook

Table 9 PEANUT FERTILIZER AND SPACING EXPERIMENT

Wiregrass Substation (Tier P and PL) 1936-43

Plot No.	Fertilizer Treatment: Grade (400 lb/A)	Materials (4)	Variety and Spacing	Yield of Dry Peanuts-Lbs/A: 1936-43 lb/A	4-yr. ave. 1940-43	4-yr. ave. (1940-43) All plots limed (4)
1	0	ck	Runner 7"	1431	1064	1327
2	0- 8-0	Slag	Runner 7"	1444	1033	1034
3	0-8-4	Slag,K	Runner 7"	1640	1410	1303
4	0	ck	Runner 7"	1420	967	908
5	0-8-4	Super,K	Runner 7"	1701	1444	1329
6	6-8-4	Slag,N,K	Runner 7"	1617	1309	1222
7	0	ck	Runner 7"	1470	1086	1061
8	0-8-4	Slag,K,Gy	Runner 7"	1666	1443	1299
9	0-8-4	Slag,K,Gy	Runner 14"	1594	1308	1164
10	0	ck	Runner 7"	1403	1016	947
11	0-8-4	Slag,K,Gy	Runner 21"	1377 1/	1334	1238
12	0-8-4	Slag,K,Gy	Runner 28"	1362 1/	1184	1076
13	0	ck	Runner 7"	1371	976	950
14	0-8-4	Slag, K,Gy	Spanish 6"	963	791	811
15	0	0	Spanish 6"	785	540	649
16	0	ck	Runner 7"	1258	867	933
17	0-8-0	Colloidal Phos.	Runner 7"	1160 2/	911	907
18	0	$MgSO_4$	Runner 7"	911 3/	956	826
19	0-8-0	Super,$MgSO_4$	Runner 7"	1021 3/	1098	947
20	0-8-4	Super, $MgSO_4$,K	Runner 7"	1330 3/	1374	1265

1/ Eight-year average of 7 crops. Failure of crop in 1939.

2/ Seven-year average. Plot 17 started in 1937.

3/ Four-year average. Plots 18, 19 & 20, added in 1940.

4/ In 1940 all phosphates were changed to super, except 5 which received slag. Also, 500 lb/A dolomitic lime applied to south half of tier annually. Gypsum applied at 200 lb/A and magnesium sulfate at 50 lb/A.

SUMMARY: Both Spanish and Runner peanut yields were increased with the addition of potash and slag (or superphosphate). The addition of lime and/or gypsum did

Table 10 Response of cotton to method and time of application of fertilizers at 3 locations, 1955

Time of application Preplanting	Sidedress	Placement	Norfolk fsl: Prattmont	Attwood fsl: Winfield	Kalmia fsl Brewton
1 60-60-60		Broadcast	1908	2272	862
2 60-60-60		Machine	1890		
3 60-60-60		Bedded	1562	2308	940
4 20-60-60	40-0-0	Broadcast	2074	2061	1170
5 20-60-60	40-0-0	Machine	1917		
6 20-60-60	40-0-0	Bedded	1998	2079	1105
7 20-20-20	40-40-40	Machine	2133		
8 20-60-20	40-0-40	Broadcast		2128	1395
9 20-60-20	40-0-40	Machine	2196		
10 20-60-20	40-0-40	Bedded		2336	1201
11 20-20-60	40-40-0	Broadcast		2047	938
12 20-20-60	40-40-0	Machine	2043		
13 20-20-60	40-40-0	Bedded		2258	990
14 20-60-0	40-0-60	Machine	1652		
15 20-0-60	40-60-0	Machine	1858		
16 0-60-60	60-0-0	Machine	1750		
CV			14.1	10.9	19.9
LSD 10%			343.5	N.S.	260.1
05%					314.4
PPM Truog Sol. P_2O_5			26		2

CONCLUSIONS:

At Prattmont bedded treatment produced less cotton than either broadcast or machine placements when all the fertilizer was applied at planting. When the N was split, placement did not affect yields. This is probably a reflection of salt injury. There was a tendency for yields to increase by spliting potash but yields were decreased at Prattmont when all the potash was applied as a sidedressing. At Brewton spliting both N and potash produced the highest yield.

L. E. Ensminger

Table 11 Fertilizer Formula for Sweet Potatoes

at Brewton and Monroeville 1937-43

Plot No.	Treatment 600#/A	Monroeville 1937-40	Monroeville 1941-43	Monroeville 1937-43	Brewton 1937-40	Brewton 1941-43	Brewton 1937-43	Ave. for Both 1937-43
		Yield - Bushels per acre						
1	4-10-6	219.6	355.8	278.0	115.0	176.1	141.2	209.6
2	4-10-0	184.1	323.0	243.6	48.2	113.6	76.2	159.9
3	4-10-4	210.8	369.0	278.6	105.2	171.7	133.7	206.2
4	4-10-8	219.4	387.1	291.3	129.0	163.1	143.6	217.4
5	4-10-6	217.8	387.8	290.7	143.6	157.9	149.7	220.2
6	0-10-6	163.1	281.7	213.9	107.8	101.3	105.0	159.4
7	2-10-6	194.0	365.9	267.7	119.8	167.1	140.1	203.9
8	6-10-6	201.7	375.6	276.2	129.2	190.0	155.3	215.8
9	4-10-6	192.6	358.4	263.6	131.5	198.9	160.4	212.0
10	4-0-6	190.0	366.6	265.7	106.0	146.5	123.3	194.5
11	4-8-6	213.5	368.9	280.1	124.4	192.6	153.6	216.8
12	4-12-6	202.5	378.4	277.9	118.3	181.2	145.3	211.6
13	4-10-6	211.2	358.9	274.5	128.4	202.1	160.0	217.2
14	0-0-0	129.8	242.0	177.9	64.0	88.2	74.4	126.2
15	800# 4-8-6	205.9	384.9	282.6	139.4	214.6	171.7	227.2
16	400# 4-8-6	186.0	337.8	251.0	107.4	179.7	138.4	194.7
17	4-10-6	201.2	375.7	276.0	119.8	220.9	163.1	219.6
Ave. of (1,5,9,13,17)	4-10-6	208.5	367.3	276.6	127.7	191.2	154.9	215.7

SUMMARY: Average response to 36 N at both locations 56 bushels.
Average response to 48 P_2O_5 at both locations 22 bushels.
Average response to 48 K_2O at both locations 58 bushels.

J.T. Cope Jr.

Table 12 Sugar Cane Fertilizer Formula Experiment

Brewton 1940-46

Treatment 1/ 600#/A	Yields Per Acre 2/							Ave.
	1940	1941	1942	1943	1944	1945	1946	40-46
6-10-6	44175	33750	34020	31125	33852	35325	21141	33341
4-10-6	29625	39825	31590	30450	33969	34500	18705	31238
8-10-6	38100	41400	38799	34350	37869	41100	20358	35996
6-8-6	33750	44100	37260	35625	36699	40050	22620	35729
6-12-6	36450	39525	39609	34050	38571	41700	25839	36534
6-10-4	38850	37350	36288	35850	42978	39300	19227	35693
6-10-8	37313	399 75	40986	36300	40170	43800	24882	37632
6-0-0	22350	20550	20169	20700	19578	21750	15399	20070
6-10-6	36750	34050	37260	35100	41496	39750	22620	35289

1/ Apply all P & K before planting. ½ N applied as $(NH_4)^2 SO_4$ at first cult. and ½ of N as $NaNO_3$ at second cult.

2/ Yield - lbs. of stripped cane/A.

SUMMARY: The variations in rates of N, P and K were small. The highest rates of each nutrient were best. There is no indication whether these rates were high enough to produce maximum yields. These data indicate that sugar cane should receive at least 48N, $72P_2O_5$, and 48 K_2O, or 600 pounds of 8-12-8.

J. T. Cope, Jr.

Table 13 Grazing Days and Beef Yields from Rates of P, K, and Lime

On Permanent Pasture on Eutaw Clay
Black Belt Substation 1941-48

Plot No.	Lime: T/A	16% Super #/A	Muriate: 60% #/A		:Cow Days per Acre and Lbs. Gain/A :1946	1947	1948	1946-48, Ave.
1	4	400 (A)	0	Cow Days	188	188	238	205
				Gain	298	280	378	319
2	0	0	0	Cow Days	87	84	94	88
				Gain	140	105	154	133
3	0	400 (A)	0	Cow Days	157	188	178	174
				Gain	255	270	292	272
4	4	200 (A)	0	Cow Days	188	188	196	191
				Gain	270	262	272	268
5	4	400 (A)	0	Cow Days	188	188	238	205
				Gain	280	262	402	315
6	4	1200 1/	0	Cow Days	188	188	238	205
				Gain	275	285	306	289
7	2	400 (A)	0	Cow Days	188	188	238	205
				Gain	280	275	386	314
8	4 3/	400 (A)	100 (A)	Cow Days	188	188	238	205
				Gain	265	250	308	274
9	4	400 (A)	0	Cow Days	188	188	238	205
				Gain	295	258	306	286
10	4 2/	400 (A)	0	Cow Days	188	188	196	191
				Gain	255	268	272	265
11	8 4/	400 (A)	0	Cow Days	188	188	196	191
				Gain	275	252	288	272

(A) Applied annually

1/ Applied once every 3 years.

2/ Plot 10 receives 4 T of Selma chalk instead of commercial limestone..

3/ Plot 8 had poorer drainage than other plots. Whole area poorly drained.

4/ Clover on about ½ of plot 11 drowned out.

5/ Plants in pasture, Dallisgrass, Persian Clover, White Dutch Clover, Lappacea Clover, Lespedeza.

SUMMARY: Days of grazing and gain of animals were both increased considerably by the addition of superphosphate to the pasture plots. Potash seemed to have no effect. The addition of lime plus superphosphate increased the number of grazing days and the gain of animals over the superphosphated plots.

Table 14 Fertilizer Strip Test on Corn at Gulf Coast Substation Showing The Crop Response of a Virgin Soil to Fertilizers and Supplements

Treatments[1] N-P_2O_5-K_2O	Supplements[2]	Corn Yields Average 1953 - 1955
0	0	6.3
NP	0	44.2
NK	0	10.4
PK	0	30.0
NPK	0	58.2
0	0	4.9
½NPK	0	44.5
NPK	$MnSO_4$	56.5
NPK	Calcitic Lime	44.9
NPK	Dolomite	46.3
0	0	4.0

1/ N-P_2O_5-K_2O applied at rate of 700 pounds per acre of 9-10-7.

2/ Lime applied at rate of 2 tons per acre.

CONCLUSIONS:

This test was initiated in 1933 to show the response of a virgin soil to various fertilizers and supplements. It was revised in 1952 and only yield data since that time are given. The data show that this soil in the virgin state is very deficient in phosphorus for corn production. The data show a moderate response to potash. Liming evidently enduced a zinc deficiency.

L. E. Ensminger

Table 15 The Effect of 4-10-7 Fertilizer on Yield of Corn Upper Coastal Plains Substation[1] 1949-1955

Fertilizer at Planting	1949	1950	1951	1953	1955	5 year Avg. 1949-55
	Yield of corn in Bu./A					
None	67.2	93.2	26.4	59.1	116.9	72.6
200# 4-10-7	76.8	95.1	37.0	69.5	116.2	78.9
400# 4-10-7	71.9	91.3	33.4	69.1	117.8	76.7
600# 4-10-7	78.8	99.4	26.3	66.6	115.3	77.3

1/ 200# ammonium nitrate sidedressed on all plots.

SUMMARY:

200 pounds of 4-10-7 supplied adequate phosphorus and potassium for corn in this test. There was very little or no response to more than 67 pounds of nitrogen to corn.

Table 16 The Effect of One vs. Two Cultivations on Yield of Corn

No. Cult.	Yield of Corn in Bu./A		
	1949	1952	Average
One Cult.	72.3	20.5	46.4
Two Cult.	74.0	21.5	47.8

This limited amount of data shows no difference between the effects of one and two cultivations on corn yields. This supports the experiment station recommendation the corn be plowed only to control weeds.

J. T. Cope Jr.

Table 17 Fertilizer Test for Grain Sorghum

Sand Mountain 1947-49, T.V. 1947

Plot No.	Formula[1]	Sand Mountain - Bu./A.			
		1947	1948	1949	Av. 1947-49
1	8-0-0	48.9	46.0	7.2	34.0
2	0-8-8	54.1	33.6	9.6	32.4
3	4-8-8	51.8	48.0	9.0	36.3
4	8-8-8	53.3	54.1	7.9	38.4
5	12-8-8	51.1	56.5	13.8	40.5
6	8-4-8	50.3	53.8	8.3	37.5
7	8-0-8	55.5	49.7	13.3	39.5
8	8-8-0	47.4	52.3	7.4	35.7
9	8-8-4	48.6	51.5	13.9	38.0
10	8-4-4	57.6	54.0	9.0	40.2
11	6-8-4	51.0	51.6	8.8	37.1
12	8-8-8[2]	47.0	55.4	8.1	36.8

1/ 600 lbs. of the formula indicated is used per acre. Apply fertilizer and bed on prior to planting. Source of N - $NaNO_3$, P_2O_5 - superphosphate, K_2O - muriate.

2/ Plot 12 receives 500 lbs. of dolomite.

CONCLUSIONS:

(1) There was a definite though very minor response to each added increment of nitrogen.

(2) There was no response to added increments of phosphorus and potash. This indicates that the level of phosphorus and potash in the soil may have been relatively high at the beginning of this test.

F. S. McCain

Table 18 Alfalfa Fertilizer Test - Gulf Coast Substation[1]

Established - Fall -1944

Treat. No.	Lime Tons/Acre	Fertilizer Treatment - Pounds Per Acre: Super	Muriate	Borax[2]	Speciman	Forage Yields - Pounds Per Acre, Dry: 1945	1946	1947	1948	1949	5 yr. av.
1	2	200	400	30	0	3938	10262	9090	2915	2061	5775
2	2	400	400	30	0	4208	9665	8840	2961	2154	6375
3	2	800	400	30	0	5131	10193	7812	4012	2653	6019
4	2	1200	400	30	0	4574	10222	7626	3078	2566	5687
5	2	800	100	30	0	3224	9502	6569	3205	2218	4424
6	2	800	200	30	0	3642	9972	9618	2979	2468	5883
7	2	800	600	30	0	4338	10059	9531	2886	2149	5896
8	2	800	600	0	0	4835	11307	10419	3066	2317	6500
9	2	800	400	30	30# Borax Annually	4513	10727	9606	2946	2021	6066
10	2	800	600	30	30# Borax Annually	4086	10512	10315	3298	2305	6241
11	2	800	600	30	No borax after 1st yr	3946	10971	8782	3403	1754	5901
12	2	800	400	30	Minor Elements[3]	5550	10313	7336	2735	2486	5693
13	2	800	400	30	6 T. Manure 1st yr. & 3 T. Annually	3354	11344	10687	2491	1974	6157
14	2	800	400	30	1/3 fert. after each cutting for 3 cuttings	3929	9932	10384	2979	2375	6062
15	1	800	400	30	0	4565	10368	9496	3182	2119	6045
16	4	800	400	30	1/2 lime plowed under and 1/2 disked under.	4408	9275	9403	4484	2648	6162
17	8	800	400	30	1/2 lime plowed under 1/2 disked under.	4486	10112	10333	3141	2642	6261
					L. S. D. - .05	N. S.	N. S.	N. S.	N. S.	N. S.	
					C. V.	18.1%	9.8%	24.2%	24.3%	21.2%	

1/ Three replications, only two replicates reported for 1945 yields. Test replanted fall 1945, Dec. 1947, Nov. 1948 - a total of four plantings for five harvest seasons. Common Bermudagrass competition was a cause of decline in stands.

2/ Thirty pounds borax per acre initially, 15 pounds subsequently as on annual treatment unless otherwise noted.

3/ Minor element treatment consisted of 30 lb. $MnSO_4$, 10 lb. $ZnSO_4$ and 10 lb. $CuSO_4$ per acre annually.

E. M. Evans

Conclusions on Back

Alfalfa Fertilizer Test (Gulf Coast Substation)

CONCLUSIONS:

There were no significant differences in yield due to fertilizer treatment in this experiment even though high rates of fertilizers were used along with exceptionally high levels of lime. This clearly indicates that some factor other than fertility (presumably Bermuda-grass competition) had the dominant effect on yield and longevity of stands. The reason Bermuda-grass can reduce the stand of alfalfa and the mechanism involved is an unsolved problem. Its severity is evidenced by the fact that four separate plantings were required for five harvest seasons.

E. M. Evans

Table 19 Alfalfa Fertilizer Test

Browton Experiment Field - Estab. 1945

Plot No.	Fertilizer Treatment, lb/A[1]			Dry Forage Yield - lb/A		
	Lime	Super Phos.	Muriate	1946	1947	2-yr. avg.
1	0	800	200	5980	1280	3680
2	2000	800	200	6560	2030	4295
3	4000	800	200	5208	2170	3689
4	2000	400	200	5359	2942	4150
5	2000	1200	200	5960	3253	4606
6	2000	800	400	6185	5215	5700
7[2]	2000	800	200	6750	6455	6625
8	4000	800	0	4376	[3]	—

1/ All plots received 30 lb. borax initially and 15 lb. annually

2/ Plot 7 received 30 lb. $MnSO_4$, 10 lb. $CuSO_4$, and 10 lb. $ZnSO_4$ annually.

3/ No yield on plot 8 reported for 1947-assume it was due to loss of stand.

CONCLUSIONS:

The yield of the no-lime plot was decidedly inferior the second year of the test. The no-potash plot yield was inferior the first year and the stand was lost prior to the second harvest year. Two plots were outstanding in producing good yields both harvest years. They were plot 6 which received 400 pounds of muriate (200 lb. K_2O) in addition to adequate amounts of lime, borax, and phosphorus, and plot 7 which received minor elements in addition to borax and other mineral fertilizers. This suggests a need for some minor element(s) for alfalfa on this soil.

E. M. Evans

Table 20 Alfalfa Fertilizer Test
Prattville Experiment Field
(Alley Strip Area 1944-45) 1/

Plot No.	Fertilizer Treatment 2/			Yield-lb/acre dry 3/
	Lime	P_2O_5	K_2O	1945
1	2T	160	120	8229
2	2T	160	120	7034
3	2T	160	120	8465

1/ Test revised 1946.
2/ Plots 1 and 3 received 30 lb. borax, plot 2 received no borax.
3/ Four harvests made in 1945.

CONCLUSIONS:

This was an observational type of experiment with a strip with no borax running through the center of the area. The two areas receiving borax made 1,000 pounds more dry forage per acre than the area receiving no borax. These data are for four harvests during one harvest year.

Table Alfalfa Fertilizer Test
Prattville Experiment Field
Revision of Above Test

Plot Nos.	Fertilizer Treatment			Dry Forage Yields - lb per acre		
	Super	Borax 1/	Muriate	1946 2/	1947 3/	2 yr. avg.
1, 9	400	15	200	10248	6675	8464
2, 10	400	15	400	10737	7014	8875
3, 11	800	15	200	10730	6796	8763
4, 12	800	15	400	11070	7536	9303
5, 13	400	0	400	10907	7460	9184
6, 14	800	0	400	10635	7100	8868
7, 15	800	0	200	10628	6034	8331
8	800	0	200	9248	6403	7826
16	0	15	400	11533	5380	8457

1/ Plot 8 was never treated with borax in previous history, other plots received borax at the rate of 30 lb. per acre in 1944. Area received 2T of lime in 1944.
2/ Four harvests in 1946 on May 2, June 3, July 10 and August 4.
3/ Three harvests in 1947. Poor stand on plots 15 and 16, last two harvests in 1947 and very poor on all plots after the last harvest in 1947.

CONCLUSIONS:

The 1946 yields show 1000 pounds more dry forage produced per acre on the plots receiving borax than on the plot that had never received borax. There apparently

Table 21 Kuszu - Fertilizer at Planting Time
Brewton Experiment Field - Established 1936[1]

Plot No.	Fertilizer Treatment[2]	Forage Yield - lb. per acre Dry 1937	1938	1939	1940	4 yr.av.	1941[2]
1	No Fertilizer Check	2058	3656	3810	3120	3161	3840
2	600#. Superphosphate	2433	3808	3900	2955	3275	3960
3	600# Super, 50 lb. Muriate	2709	4508	4320	3150	3672	4470
4	1 shovelful stable manure/hill	2856	6030	4620	3765	4318	4920
5	800 lb. Basic Slag, 50 lb. Muriate	2699	5682	4770	3375	4132	4200
6	No Fertilizer Check	2289	5286	4800	3135	3878	3870

1/ Crowns set up 3 1/2 ft. rows, 3 ft. in the drill
2/ Treatment repeated in 1941 - same as initial except 3 T manure broadcast on plot 4.

CONCLUSIONS:

Although the design of this experiment does not permit evaluation of small differences, there appears to be some response to additions of fertilizer to kudzu at planting time. One shovelful of stable manure per hill gave the best results but was only slightly better than 800 lb. basic slag and 50 lb. muriate of potash per acre. The improvement in the 4-year average yield for use of fertilizer was very slight.

Table Kudzu Fertilizer Test - Prattville Experiment Field[1]

Plot No.	Fertilizer Treatment 2/	Forage Yield - Lb. Per Acre Dry[3] 1937	1938	1939	1940	1941	5 yr.av.
1	No Fertilizer Check	7560	5790	6510	2040	5700	5740
2	600 lb. Basic Slag, 150 lb. Muriate	7620	5790	7140	2580	5580	5980
3	1200 lb. Basic Slag, 150 lb. Muriate	7140	5190	6690	2340	4950	5495
4	2400 lb. Basic Slag, 150 lb. Muriate	7635	5520	7050	2370	5400	5718
5	1200 lb. Basic Slag	7530	5730	6600	2100	5340	5660
6	No Fertilizer Check	6300	5055	5580	2070	5430	5169
7	No Fertilizer Check	5985	5655	5820	1560	5220	5300
8	1T Lime, 600 lb. Super., 150 lb. Muriate	7050	6645	7080	2430	6180	6103
9	600 lb. Super., 150 lb. Muriate	6765	5790	6900	2190	5550	5683
10	1200 lb. Basic Slag, 50 lb. Muriate[4]	6915	5610	6360	1890	6000	5488
11	6 Tons Stable Manure	7230	5070	7020	2310	5340	5485
12	No Fertilizer Check	6150	4080	5160	1710	5250	4640

1/ Experiment initiated in 1936 on an area established in Kudzu about 1930.
2/ Fertilizer applied every 3 years unless otherwise noted.
3/ Harvested twice each year in June and just before frost except only 1 cutting in 1940 due to drought.
4/ Plus 400 lb. slag and 50 lb. muriate annually.

CONCLUSIONS:

The data from this test indicate that once kudzu is well established it responds very little to applications of fertilizer.

E. M. Evans

Table 22 Pasture Fertilizer Experiment[1] / Tier 1-P
Tennessee Valley Substation 1938-41

Plot No.	Fertilizer Treatment: Dolomite #/A	Super-phos. #/A	Muriate #/A	Frequency of Application[2]	Green Wt. - Pounds per acre: 1938	1939	1940	1941	Avg. 1938-1941	Increase Over Check[3]
1	0	0	0	0	1920	5712	3492	3018	3536	0
2	2000	0	0	0	2020	7034	3624	3278	3989	291
3	2000	600	0	3 yrs.	3986	10170	4828	6842	6456	2596
4	0	600	0	3 yrs.	2894	6914	4060	3994	4466	444
5	0	600	75	3 yrs.	3426	7486	4242	4370	4884	700
6	0	0	0	0	2448	7126	4098	3706	4344	0
7	2000 (calcium carb.)	600	75	3 yrs.	5992	11788	4354	8352	7622	3151
8	2000	600	75	3 yrs.	6136	10534	5566	8528	7691	3093
9	2000	200	25	(Fall annually)	3708	9324	5348	7414	6448	1723
10	2000 (200# nitrate annually)	200	25	(Spring annu.)	4226	10122	5078	6670	6524	1672
11	2000	600	75	3 yrs.	9208	12902	5926	8368	9101	4122
12	0	0	0	0	3378	8438	4056	4548	5105	0
13	2000	200 600	25 75	Annually in beginning	10574	15458	5438	9344	10204	5197
14	1000	600	75	3 yrs.	10240	14024	5844	8936	9761	4460
15	5000	600	75	3 yrs.	9410	13750	5452	8684	9324	4513
16	2000	600	75	Do not repeat	7348	11726	5014	6174	7566	2853
17	2000	300	75	3 yrs.	5656	10142	4902	6594	6824	2209
18	0	0	0	0	3112	7140	4090	3712	4514	0
19	2000	900	75	3 yrs.	7970	13494	4798	7600	8466	4100
20	2000	1200 (Rock phos.)	75	3 yrs.	7114	15378	4848	7956	8824	4606
21	0	1200 (Triple Super)	75	3 yrs.	3188	6804	4418	4076	4622	552
22	2000	200 (Basic slag)	75	3 yrs.	3816	9190	4854	7052	6228	2306
23	0	1200	75	3 yrs.	4614	10906	4286	6764	6642	2368
24	0	0	0	0	2212	5808	3516	2974	3628	0
25	0	400 (Basic slag)	25	Annually	2726	9730	5052	6800	6077	2449

1/ Oct. 12, 1938, fertilizer and lime weighed out and applied by hand. Seed carefully weighed out, applied by hand and covered with a corrogated roller. Seeding rate is as follows:

Ky. Blue grass	25#/A
Orchard grass	15#/A
White clover	5#/A
Hop clover	3#/A
Dallis grass	20#/A
Common Lespedeza	25#/A

2/ Interval of application referrs to material other than lime. All lime application to be made only in the beginning.

3/ Adjusted for soil gradient

E. M. Evans

Pasture Fertilizer Experiment
Tier 1 P Tennessee Valley Substation
1938-1941

Yields are low for green weight, but this could be due to relatively few harvests during any one year. The best yield was obtained on treatment 13 which received 1 ton lime, 600 lb. superphosphate and 75 lb. muriate of potash initially with 200 lb. superphosphate and 25 lb. muriate being applied annually thereafter.

Response to lime:

The lime study was carried out on treatments receiving 600 lb. of super and 75 lb of muriate every three years. The zero lime plot yielded 700 lbs. of green forage more than the no-treatment check. 1,000 lbs. of lime gave an increase of 4,460 pounds over the check, 1 ton of lime produced 3,151 pounds and 2 1/2 tons 4,513 pounds more than the check. There was no response to lime for rates higher than 1/2 ton for the four-year period of this study. One ton of lime without other minerals produced only 291 pounds of green forage more than the untreated check.

Response to phosphorus:

The phosphorus study was carried out on treatments receiving 1 ton lime initially and 75 pounds of muriate every three years or 25 pounds of muriate as an annual treatment. The rate of potassium is quite low and could possibly have been limiting to some extent. With the exception referred to as treatment 13 above, the highest yielding plot received 1200 lb. of superphosphate every 3 years. The yield was only 146 pounds of green weight more than that from 600 lb. of super every 3 years. However, Rock phosphate was not a satisfactory source of phosphorus, triple super and basic slag were much superior to rock, but were inferior to regular superphosphate at comparable rates (treatment 22 and 23 vs. treatment 7.)

Response to potassium:

There was no rate of potash study in this test but yield was improved by 555 pounds per acre for 75 lb. of muriate every 3 years versus to no-potash(treatment 3 vs. treatment 7).

Plot No.	Fertilizer #/A 2/ Dolomite	Super	Muriate	Frequency of Application	Green Wt. Pounds/A 1940	1941	Avg. 1940-41
1	0	0	0	0	325	2698	1512
2	4000	0	0	0	416	3504	1960
3	4000	600	0	3 yrs.	379	5246	2813
4	0	600	0	3 yrs.	424	4798	2611
5	0	600	75	3 yrs.	325	4008	2167
6	0	0	0	0	267	2328	1298
7	4000	600	75	3 yrs.	465	5712	3089
8	4000	200	25	Annually (Fall)	343	4390	2367
9	4000	200	25	Annually (Spring)	340	5136	2738
10	200# $NaNO_3$ Annually 4000	600	75	3 yrs.	758	5956	3357
11	(Cal. Lime) 4000	600	75	3 yrs.	433	4556	2495
12	0	0	0	0	263	1944	1104
13	Blast Furnace slag 6000	600	75	3 yrs.	420	5158	2789
14	2000	600	75	3 yrs.	393	4772	2578
15	4000	300	75	3 yrs.	323	3892	2108
16	4000	900	75	3 yrs.	429	5606	3018
17	4000	1200	75	3 yrs.	560	6992	3776
18	0	0	0	0	339	2626	1483
19	4000	Triple super 200	75	3 yrs.	428	5726	3077
20	(300# gypsum) 4000	Triple super 200	75	3 yrs.	405	4964	2685
21	(150# gypsum) 4000	Triple super 200	75	3 yrs.	425	5790	3108
22	(75# gypsum) 4000	Triple super 200	75	3 yrs.	355	5026	2691
23	4000	Triple 100 + 300 super	75	3 yrs.	386	5142	2764
24	0	0	0	0	272	2500	1386
25	(150# gypsum) 4000	(Cal. Meta Phos.) 160	75	3 yrs.	415	5716	3066
26	(150# gypsum) 4000	(Rock Phos.) 1200	75	3 yrs.	310	2830	1570
27	(150# gypsum) 4000	(Cal. Phos.) 516	75	3 yrs.	305	2816	1561
28	0	(Basic Slag) 800	75	3 yrs.	391	4426	2409

Plot No.	Fertilizer #/A 2/ Dolomite	Super	Muriate	Frequency of Application	Green Wt. Pounds/A 1940	1941	Avg. 1940-41
29	0	Basic Slag 267	25	Annually	335	3206	1771
30	0	0	0	0	247	2388	1318
31	0	Basic Slag 2000	100	5 yrs. 3/	372	6316	3344
32	(200# gypsum in beginning only) 0	Rock Phos. 717	100	5 yrs. 3/	301	3884	2093
33	(200# gypsum in beginning only) 0	Cal. Phos. - 1290	100	5 yrs. 3/	281	3656	1969
34	4000	1500	100	5 yrs. 3/	413	7584	3999
35	0	Rock Phos. 478 + Super 50	100	Annually 3/4/	337	3354	1846
36	0	0	0	0	241	1662	952

1/ Prepared Land thoroughly and disked in the fall of 1939, double section harrowed in both directions after fertilizer was applied, March 6, 1940.

Seeding: 10# imported Dallis grass
10# Common lespedeza
4# White Dutch Clover
10# Orchard grass
10# Kentucky bluegrass
5# Red top.

2/ Phosphate applications on plots 7, 19, 20, 21, 22, 23, 25, 27 and 28 to supply 96 # P_2O_5 per acre every 3 yrs.

3/ Muriate app. on plots 31, 32, 33, 34 and 35 to be made in the beginning and at 5 year intervals. Phosphate app. in the beginning only. Application of phosphate materials on plots 31, 32, 33, 34 and 35 set up on basis equivalent to a ton of basic slag per acre (12% P_2O_5 = 240# P_2O_5 every 10 yrs.)

4/ Phosphate on plot 35 equivalent to plots 31, 32, 33 and 34 over 10 year period. 2/3 derived from initial application of 33.45% rock phos. and 1/3 derived from annual application of 16% superphosphate.

CONCLUSIONS:

Yields from this experiment are exceptionally low for green weights being on the order of one tenth of what would be expected from a really productive pasture. The low yield range and short duration of the experiment made comparison of treatment effects very difficult. The best yielding treatment was 2 tons of lime, 1500 pounds of superphosphate and 100 pounds of muriate of potash per acre. This treatment (No. 34) was to be repeated every 5 years but the experiment was discontinued after only two years probably due to a heavy infestation of Common Bermuda grass.

Table 24 Lime and Fertilizer Experiment No. 1 - Alfalfa
Tennessee Valley Substation 1931-36

Plot No.	Treatment #/A3/ Lime	Acid Phos.	Muriate	Dry Hay- Pounds per acre 1931	1932	1933	1934	1935	1936 1/	Avg. 1931-36	Incr. over check 2/
1	0	0	0	970	4530	3020	1640	1600	320	2013	0
2	3000	0	0	1270	4290	4230	2520	3640	720	2795	511
3	3000	1000	0	2910	5720	5760	3240	4240	880	3792	1237
4	3000	2000	0	4032	7670	7260	4440	6440	1360	5201	2375
5	0	0	0	1876	5210	4980	2760	3160	600	3098	0
6	6000	0	0	2256	6630	6180	4240	5680	1080	4345	1319
7	6000	1000	0	3400	6970	6190	3800	4760	880	4333	1379
8	6000	2000	0	4154	8000	7720	5000	7400	1400	5613	2731
9	0	0	0	1708	5020	4770	2360	2560	440	2810	0
10	6000	2000	200	3558	7140	7100	4360	6000	1120	4880	2319
11	0 (Basic slag)	2000	200	1706	5970	5800	2600	2440	360	3146	834
12	3000	0	200	3314	6050	5630	3560	3760	600	3819	1756
13	0	0	0	1088	4740	2700	1400	840	120	1815	0

1/ 1936 was the last cutting under the original plan. The experiment was changed and replanted in the fall of 1936.

2/ Increase of yield over check (corrected for soil gradient).

3/ Treatments applied only initially.

CONCLUSIONS:

Although the average yields are not high, if allowance is made for the seeding year and the low yield the year the stand was plowed under the yields average between 3 and 4 tons of hay per acre for 4 years on the better treatments. Phosphorus gave the greatest yield increase and lime the second greatest. Response to potassium was not obtained at the rates used in this experiment.

E. M. Evans

Table 26 Lime, Phosphate and Potash Experiment - Alfalfa

Tennessee Valley 1933-1937

Plot No.	Fertilizer #/A1/ Lime	Super	Muriate	Alfalfa Hay- Pounds per acre5/ 1933	1934	1935	1936	1937 6/	Avg. 1933-37	Increase over checks*
1	0 (Basic slag)	0	0	3544	2490	3210	1410	1035	2338	0
2	1000 (Basic slag)	0	0	4639	2610	3405	1140	870	2533	555
3	3000 (Basic slag)	0	0	7691	4380	6120	2595	1560	4470	2852
4	5000	0	0	7556	4980	6450	3045	2085	4823	3565
5	0 (Basic slag)	0	0	1376	1215	870	420	600	897	0
6	1000 (Basic slag)	0	400	4035	2055	2445	975	660	2034	1158
7	3000 (Basic slag)	0	400	7549	4125	6630	2490	1200	3567	2712
8	5000	0	400	7624	4995	6915	2985	1710	3945	3111
9	0 (Dolomite)	0	0	1549	1020	765	360	375	814	0
10	6000 (Dolomite)	2000	0	7635	4305	6090	2685	1920	4347	3550
11	6000 ($CaCO_3$)	2000	400	7665	5205	7470	3270	2475	5217	4437
12	6000	2000	400	7241	5010	7470	3195	2715	5126	4363
13	0 (Dolomite)	0	0	1226	825	795	435	435	744	0
14 4/	6000 (Dolomite)	2000	400	7545	4980	7365	3090	2640	5124	4426
15	6000 (Dolomite)	500 2/	400	5989	4995	7710	3540	2880	5023	4371
16 3/	2500	2800	400	7335	4590	7260	2985	2040	4842	4236
17	0	0	0	1039	660	450	270	375	559	0

1/ All plot treatments as indicated are repeated at each replanting except certain ones on plot 14 and 15 as shown in footnotes.

2/ 500# super applied annually in spring beginning in 1934.

3/ Treatment on plot 16 is roughly equivalent to plot 8.

4/ Applied at every other planting.

5/ 3 cutting in 1933; 2 in 1934; 3 in 1935; 2 cutting in 1936; 1 in 1937.

6/ Land turned immediately after 1st cutting in 1937 on account of the stand being too thin.

* Increase of yield over check (corrected for soil gradient)

CONCLUSIONS:

There was response to Basic slag up to the 5,000 pound rate at each replanting. There was a yield increase due to lime up to 6,000 lbs. of Dolomite and response to potash at the 400 pound rate used.

E. M. Evans

Table 27 Lime, Phosphate and Potash Experiment - Alfalfa

The plots were replanted, fall 1941, and failed to get and hold a good stand. Attributed failure to dry weather. Plowed tier, applied fertilizer and planted again in 1942. Alfalfa failed in 1942, 43 and 44 on these plots while alfalfa planted on similar land (not previously seeded to Alfalfa) and given similar fertilizer treatment has made fully twice the tonnage of hay. The Alfalfa on the plots looked as if it were diseased, made poor growth and the plants had a tendency to doe out to where we had no stand. In view of the fact that we have made a failure on the plots for the past three years, we decided to plow under the sod this fall and plant to some other crop for two or three years.

Lime, Phosphate and Potash Experiment - Alfalfa (Revised)
Tennessee Valley 1938-1941

Plot No.	Fertilizer #/A. Lime	Super	Muriate	Alfalfa Hay-Pounds per acre 1938	1939	1940	1941 5/	Avg. 1938-1941	Incr. over checks*
1	0	0	0	4620	4245	2340	480	2921	0
2	1000 (Basic slag) 1/	0	600 2/	4620	8535	5730	2625	5378	2736
3	0	0	0	4635	4500	2850	885	3218	855
4	0	0	0	4800	5175	3060	1200	3559	1475
5	0	0	0	2805	2550	1020	840	1803	0
6 4/	500 3/	188 (Triple super) 1/	200 2/	3960	4560	4725 6/	2025	3818	1991
7	0	0	0	4575	4320	2910	1140	3236	1385
8	0	0	0	5280	5640	3615	1530	4016	2141
9	0	0	0	3135	2310	1440	720	1901	0
10	0	0	0	4995	5205	3150	1320	3668	1726
11	0	0	0	5775	6480	4305	1665	4556	2573
12	0	0	0	5835	6075	4380	1710	4500	2474
13	0	0	0	3150	2625	1725	765	2066	0
14	0	2000 2/	0	6075	7425	5085	2025	5153	3190
15	0	500 1/	0	6345	7590	5520	2175	5408	3548
16	3500 (Dolomite) 2/	500 1/	0	6090	7725	5175	2010	5250	3493
17	0	0	0	2640	2010	1290	675	1654	0

1/ Annual application from 1938 - 41; 1938-39 only.
2/ Applied in the beginning (1938-39) only
3/ Applied 1940-41 only
4/ In fall of 1939, plot 6 received 2500# per acre of finely ground marble dust and the east half received 250# of gypsum per acre. Annual application of lime began in 1940
5/ Due to drouth only one cutting of alfalfa made in 1941.
6/ Plot 6 east half (gypsum) yielded 56#/plot 1st cutting
west half (no gypsum) yielded 70#/plot 1st cutting.

CONCLUSIONS:

Table 28 Sericea Lespedeza Fertilizer Test - Sand Mt.
1941 - 1944

Plot No.	Fertilizer #/A Super	Muriate	Frequency of Application	Dry Hay- Pounds per acre 1941	1942	1943	1944	Avg. 1941-1944
1	0	0	0	2140	2720	2355	1610	2206
2	200	0	Annually	3165	5185	3250	1820	3355
3	200	50	Annually	3704	5585	3570	1580	3610
4	400	100	Every 5 years	3100	5045	3200	1630	3244
5	300	200	Every 5 yrs.	3476	5925	3445	1330	3544
6	1000	200	when needed	4300	5460	3340	1260	3590

CONCLUSIONS:

There was a yield increase due to treatment up to 200 pounds of superphosphate and 50 pounds of muriate of potash per acre annually. Higher rates than these were not tested on an annual basis but a comparison of this treatment with higher rates during years immediately following establishment indicates little or no consistent response to rates of fertilizers above this amount.

E. M. Evans

Table 29 Oat Fertilizer Experiment on Vaiden Soil - Black Belt 1935-40

Yield of Oats in Bushels per acre - Vaiden Soil

Plot No.	Fertilizer Formula 1/	Bu./A. 8/ 1935-40
1	0	23.7
2	6-0-0	25.7
3	6-3-0	39.0
4	6-6-0	44.3
5	0	18.9
6	6-9-0 2/	44.3
7	6-9-0 3/	40.7
8	6-9-0 4/	47.5
9	0	24.2
10	6-9-0 5/	41.9
11	3-3-0	37.4
12	6-9-0 6/	42.3
13	0	25.5
14	3-3-0 7/	39.9

1/ Applied at rate of 600 pounds per acre.

2/ Superphosphate

3/ The 9% phosphorus is applied every other year.

4/ Phosphorus applied as basic slag.

5/ Phosphorus as slag applied every other year.

6/ Nitrogen as ammonium sulfate. All other plots get nitrate of soda. Nitrogen applied as topdressing each spring.

7/ Phosphorus applied in the drill. Minerals broadcast on all other plots.

8/ Average for 3 replications.

Table 30 Oat Fertilizer Experiment on Sumter Soil --- Black Belt 1932 - 40

Yield of oats in bushels per acre - Sumter soil

Plot No.	Fertilizer Formula 1/	Bu./A. 4/ 1932-40
1	6-10-4	40.9
2	6-10-0	42.7
3	3-10-4	37.1
4	9-10-4	44.8
5	6-10-4	41.3
6	6-0-4	28.0
7	0-10-4	29.9
8	Nitrate of Soda 6-10-4	46.7
9	6-10-4	39.5
10	Ammo-Phos 2/ 6-10-4	37.3
11	Ammo-Phos 3/ 6-10-4	35.4
12	6-10-4 3/	37.1
13	6-10-4	41.7
14	0	20.6

1/ Applied at rate of 600 pounds per acre. Fertilizer made from superphosphate, ammonium sulfate and muriate except as indicated. In general, minerals were applied before planting and nitrogen as a topdressing except as indicated.

2/ Applied as topdressing.

3/ All fertilizer applied at planting, broadcast and disked in. Nitrogen fertilizer on all other plots applied as topdressing each spring.

4/ Average for 3 replications.

SUMMARY

Oats on Sumter soil gave a response up to 36 lbs. of nitrogen and showed an increase of about 14 bushels for 60 pounds of P_2O_5 over no phosphorus. No response to potash was obtained. Nitrate of soda was a better source of nitrogen on this calcareous soil than either Ammo-Phos or ammonium sulfate.

Data from this experiment for the years 1932 through 1936 are published in Experiment Station Circular No. 78, July 1937.

C. M. Wilson

Table 31A Sources of Nitrogen No. 1

Cropping System: Two year rotation of cotton and corn.

Plot No.	Source of N[1]	Yield of seed cotton in lbs. per acre				
		Unlimed			Limed	
		Sand Mt. 1929-45	Tenn. Valley 1929-45	Wiregrass 1930-40	Tenn. Valley 1929-45	Wiregrass 1930-41
1	None	603	1176	820	1313	973
2	Cal-nitro[4]	1332	1605	1404	1672	1492
3	Sodium nitrate	1455	1604	1455	1658	1587
4	Sodium nitrate[2] (all under)	1458	1547	1323	1683	1533
5	None	572	1110	708	1161	947
6	Ammonium sulfate	1128	1504	1359	1523	1602
7	Ammonium sulfate[2] (all under)	1155	1433	1253	1523	1449
8	Cyanamid ammo-phos	No average as treatment changed				
9	None	542	1039	706	1095	927
10	Urea	1351	1489	1382	1520	1513
11	Calcium nitrate[4]	1349	1519	1405	1535	1568
12	Di-ammonium phosphate[2/3]	956	1510	1006	1540	1425
13	None	559	1145	682	1187	977
14	Leunasaltpeter	No average as treatment changed				
15	Cotton seed meal[2]	1428	1592	1440	1577	1586
16	Calcium cyanamid[2]	1266	1608	1437	1614	1532
17	None	617	1228	831	1232	942

1/ Fertilized at rate of 600 lbs. 6-10-4 per acre. P_2O_5 from superphosphate and K_2O from muriate unless otherwise stated.

2/ All N under cotton

3/ All P_2O_5 supplies by di-ammonium phosphate.

4/ Changed to urea in 1942

Summary

See Sources of Nitrogen Bulletin

C. E. Scarsbrook

Table 31B Sources of Nitrogen No. 1

Cropping System: Two year rotation of cotton and corn.

Plot No.	Source of N[1]	Yield of corn in bushels per acre				
		Unlimed			Limed	
		Sand Mt. 1930-45	Tenn. Valley 1929-45	Wiregrass 1930-40	Tenn. Valley 1929-45	Wiregrass 1930-40
1	None	6.3	25.9	11.9	25.6	18.5
2	Cal-nitro[4]	32.8	39.7	25.8	40.5	29.7
3	Sodium nitrate	36.2	39.5	28.3	40.1	28.9
4	Sodium nitrate[2] (all under)	33.5	38.4	26.2	39.0	27.6
5	None	6.4	22.4	10.4	23.5	16.2
6	Ammonium sulfate	30.6	37.1	24.3	38.0	31.0
7	Ammonium sulfate[2] (all under)	28.7	38.0	24.7	38.8	29.0
8	Cyanamid ammo-phos	No average as treatment was changed				
9	None	6.1	21.3	10.2	22.7	15.8
10	Urea	31.1	37.8	25.6	38.8	29.3
11	Calcium nitrate[4]	34.6	38.9	26.9	39.8	29.0
12	Di-ammonium phosphate[2/3]	27.9	34.6	25.8	36.8	29.5
13	None	6.2	22.9	10.5	24.2	17.0
14	Leunasaltpeter	No average as treatment was changed				
15	Cottonseed meal[2]	23.5	37.8	25.2	38.6	28.4
16	Calcium cyanamid[2]	26.9	39.1	24.8	39.9	26.4
17	None	7.0	25.6	14.3	26.4	18.1

1/ Fertilized at rate of 600 lbs. 6-5-2 per acre. P_2O_5 from superphosphate and K_2O from muriate unless otherwise stated.

2/ All N under corn

3/ All P_2O_5 supplies by di-ammonium phosphate.

4/ Changed to urea in 1942.

Summary

See Sources of Nitrogen Bulletin

C. E. Scarsbrook

Table 32A . Sources of Nitrogen No. 2 - Eight Year (1946-53)

Average yields of cotton produced with source of nitrogen indicated

Plot No.	Pounds of N Per Acre	Source of N 1/	Yields of Seed Cotton Per Acre in Lbs.				
			Monroe-ville	Sand Mt.	Tenn. Valley	Wiregrass	Ave.
1	36	Ammonium nitrate + limestone 2/	1159	1154	1292	750	1089
2	48	Ammonium nitrate + 300 lbs. limestone in 1946	1482	1504	1622	939	1387
3	48	Sodium nitrate + basic slag	1395	1505	1535	1005	1360
4	48	Ammonium sulfate + basic slag	1478	1470	1566	1076	1398
5	36	Ammonium nitrate + limestone	1337	1262	1463	795	1214
6	48	Ammonium sulfate	794	154	1419	587	739
7	48	Ammonium sulfate + limestone	1438	1570	1608	988	1401
8	48	Sodium nitrate	1433	1541	1546	949	1367
9	36	Ammonium nitrate + limestone	1238	1191	1494	770	1173
10	48	Sodium nitrate 3/4 + ammonium sulfate 1/4	1565	1452	1589	1027	1408
11	72	Sodium nitrate 3/4 + ammonium sulfate 1/4	1694	1820	1645	1143	1576
12	96	Sodium nitrate 3/4 + ammonium sulfate 1/4	1644	1638	1680	1064	1507
13	36	Ammonium nitrate + limestone	1316	1202	1522	837	1219
14	36	Ammonium nitrate + limestone	1427	1410	1573	1046	1364
15	48	Ammonium nitrate + limestone 3/	1401	1348	1609	1001	1340
16	48	Ammonium nitrate	1311	1448	1564	891	1304
17	36	Ammonium nitrate + limestone	1203	1145	1319	702	1092

1/ Treatments since revision in 1946. For treatments prior to 1946 see old project outline.

2/ Where limestone was added the amount was sufficient to neutralize the acidity.

3/ All plots received P_2O_5 and K_2O at rate of 60 pounds per acre except plot 15 which received 48 lbs. P_2O_5 and 24 lbs. K_2O per acre.

Conclusions: See Sources of Nitrogen Bulletin.

C. E. Scarsbrook

Table 32B Sources of Nitrogen No. 2 - Eight Year (1946-53)

Average yields of corn produced with the source of nitrogen indicated

Plot No.	Pounds of N per acre	Source of N[1]	Yield of corn in bus. per acre: Monroe-ville	Sand Mt.	Tenn. Valley	Wiregrass	Ave.
1	36	Ammonium nitrate + limestone[2]	38.4	25.0	32.7	21.5	29.4
2	48	Ammonium nitrate + 3000 lbs. limestone in 1946	48.4	41.3	40.4	23.8	38.5
3	48	Sodium nitrate + basic slag	44.1	49.6	42.2	22.6	39.6
4	48	Ammonium sulfate + basic slag	43.0	38.2	39.6	24.7	36.4
5	36	Ammonium nitrate + limestone	41.8	23.7	31.8	19.9	29.3
6	48	Ammonium sulfate	44.8	21.7	38.2	19.0	30.9
7	48	Ammonium sulfate + limestone	45.8	37.1	38.5	23.7	36.3
8	48	Sodium nitrate	45.8	45.1	39.4	21.0	37.8
9	36	Ammonium nitrate + limestone	38.7	21.8	30.9	17.3	27.2
10	48	Sodium nitrate 3/4 + ammonium sulfate 1/4	47.6	41.1	37.9	22.5	37.3
11	72	Sodium nitrate 3/4 + ammonium sulfate 1/4	52.4	62.2	46.2	24.4	46.3
12	96	Sodium nitrate 3/4 + ammonium sulfate 1/4	54.7	72.0	50.1	25.9	50.7
13	36	Ammonium nitrate + limestone	40.4	22.7	31.6	19.6	28.6
14	36	Ammonium nitrate + limestone	44.1	28.9	35.6	22.6	32.8
15	48	Ammonium nitrate + limestone[3]	48.8	41.7	42.4	22.9	39.0
16	48	Ammonium nitrate	48.3	37.4	40.8	21.2	36.9
17	36	Ammonium nitrate + limestone	38.5	22.8	32.8	19.6	28.4

[1] Treatments since revision in 1946. For treatments prior to 1946 see old project outline.

[2] Where limestone was added the amount was sufficient to neutralize the acidity.

[3] All plots received P_2O_5 and K_2O at rate of 60 pounds per acre except plot 15 which received 24 lbs. of P_2O_5 and 12 lbs. of K_2O.

Conclusions: See Sources of Nitrogen Bulletin

C. E. Scarsbrook

Table 33 Nitrate of Soda vs. Sulfate of Ammonia - Main Station

Plot No.	Treatments 1/	Yield in pounds of seed cotton per acre 1934-50	1951-53 2/
	(Unlimed West Section)		
1	400 lbs. nitrate of soda	1053	1216
2	300 lbs. ammonium sulfate	1028	1040
3	No N	322	331
4	200 lbs. nitrate of soda	1004	1030
5	150 lbs. ammonium sulfate	894	833
6	400 lbs. nitrate of soda	1202	1170
7	300 lbs. ammonium sulfate	885	895
8	No N	346	317
9	200 lbs. nitrate of soda	952	1060
10	150 lbs. ammonium sulfate	866	870
	(Limed East Section)		
1	400 lbs. nitrate of soda-360 lbs. lime	938	1289
2	300 lbs. ammonium sulfate-360 lbs. lime	1135	1227
3	No N - 180 lbs. lime	230	315
4	200 lbs. nitrate of soda - 180 lbs. lime	821	911
5	150 lbs. ammonium sulfate - 180 lbs. lime	804	848
6	400 lbs. nitrate of soda - 360 lbs. lime	1017	1188
7	300 lbs. ammonium sulfate - 360 lbs. lime	1160	1299
8	No N - 180 lbs. lime	338	333
9	200 lbs. nitrate of soda - 180 lbs. lime	874	971
10	150 lbs. ammonium sulfate - 180 lbs. lime	914	999

1/ Prior to 1951 each plot received 800 lbs. 18% superphosphate and 200 lbs. of 50% muriate of potash.

2/ Beginning in 1951 superphosphate reduced to 300 lbs. per acre of 18% material and muriate of potash to 100 lbs. of 60% material. Es-Min-El applied to all plots at rate of 100 lbs. per acre.

Conclusions

Lime caused a decrease in yield where nitrate of soda was applied but increased the yield when applied with ammonium sulfate.

Lime was of no value unless nitrogen was also added.

On limed plots there was no difference in the yields from equivalent amounts of nitrogen from either source. Nitrate of soda was superior on unlimed plots.

The 64 pound rate of nitrogen gave higher yields than the 32 pound rate.

Table 34 Corn Variety Spacing and Rate of Nitrogen 1950-53

Location	Variety	Nitrogen 3/ per acre in lbs.	Drill row spacing 12"	18"	24"	30"
Wiregrass Substation	A Dixie 18	30	25.7	28.5	28.7	29.0
		60	28.1	26.6	29.8	30.3
		90	24.5	29.1	25.7	29.1
		120	23.2	25.8	26.4	28.9
	B Dixie 11	30	24.8	27.8	31.3	30.8
		60	29.4	27.6	32.4	31.6
		90	27.0	28.5	31.6	30.8
		120	26.1	28.6	31.3	31.1
Tennessee Valley Substation	A U. S. 13	30	19.5	26.7	29.1	28.1
		60	28.2	31.2	37.0	34.3
		90	32.2	34.9	33.3	36.8
		120	33.1	36.4	32.9	36.0
	B Dixie 33 1/	30	19.8	26.0	29.5	37.4
		60	26.0	35.8	30.2	36.5
		90	32.4	28.9	33.7	33.3
		120	32.4	37.1	34.8	33.6
Sand Mountain Substation	A P.A.G. 620	30	20.3	31.6	35.7	37.7
		60	44.7	52.1	51.5	53.0
		90	64.3	63.8	60.4	58.0
		120	72.4	69.3	63.5	58.5
	B Dixie 33 2/	30	18.5	23.8	26.7	27.0
		60	33.4	38.6	38.8	40.5
		90	48.9	50.9	50.8	49.3
		120	52.0	50.2	52.3	47.7
Lower Coastal Plain Substation	A Dixie 18	30	27.8	27.8	28.7	26.7
		60	39.7	35.8	35.9	32.0
		90	38.2	36.9	36.1	35.7
		120	43.2	35.8	35.4	32.5
	B N.C. 27	30	28.3	30.0	31.3	29.7
		60	35.7	39.9	36.5	34.6
		90	41.5	41.9	41.0	39.3
		120	44.3	41.3	37.8	37.6
Gulf Coast Substation	A Dixie 18	30	62.9	65.3	54.6	55.6
		60	77.0	68.1	60.5	55.7
		90	71.4	71.6	62.4	57.0
		120	76.0	72.5	62.1	59.1
	B Cokers 811	30	59.9	65.8	49.0	46.6
		60	72;3	67.7	66.4	55.4
		90	76.8	74.4	65.2	57.6
		120	79.8	74.1	62.8	60.6

1/ Dixie 18 from 1950-51

2/ N.C. 27 from 1950-51

3/ All plots received P_2O_5 and K_2O at rate of 60 lb. per acre.

CONCLUSIONS

Wiregrass Substation

Best spacing 18" - 24". No response to over 30 lb. N.

Tennessee Valley Substation

Best spacing 18" - 24". Response to 60-90 lb. N.

Sand Mountain Substation

Best spacing 18" - 24". Response to 60 - 90 lb. N.

Lower Coastal Plain Substation

Best spacing 12" - 18". Response to 60-90 lb. N.

Gulf Coast Substation

Best spacing 12". Response to 60 - 90 lb. N.

C. E. Scarsbrook

50B

Table 35 Rates and Dates of Application of Nitrogen to Oats at Four Locations 1952-1954

Treatment No.	Nitrogen per acre in pounds 1/	Dry matter produced before March 1: Lower Coastal Plain 1952	Upper Coastal Plain 1953 - 54	Piedmont 1953-54	Black Belt 4/ 1954	Grain in bu. per acre: Lower Coastal Plain 1952	Upper Coastal Plain 1953-54	Piedmont 1953-1954	Black Belt 1953-1954
1	0-40	Not Clipped	890	Not Clipped	Not Clipped	76.9	72.1	21.0	31.1
2	40-40		852			71.4	69.9	27.3	40.1
3	0-0	637	705	1094	979	18.7	52.3	11.0	18.8
4	20-20	1262	728	1209	953	42.4	66.4	18.5	24.4
5	40-0	1718	755	1495	942	16.2	56.8	8.2	22.8
6	40-40	1674	835	1556	1032	54.4	68.1	25.1	32.2
7	40 AE-40 2/	2000	895	1582	1146	54.9	70.3	25.6	35.9
8	80-0	2197	620	1811	901	21.7	53.0	9.8	26.4
9	60-60	1890	744	1715	932	61.3	70.5	29.8	33.4
10	40-40-40 3/	2579	1190	1974	1235	59.9	69.8	25.3	30.9

1/ First nitrogen applied at planting, second application after second clipping except as noted. All plots received 1000 lb. per acre of 0-16-8 before planting.

2/ First nitrogen applied after emergence.

3/ Second application of nitrogen after first clipping and third after last clipping.

4/ One year average as part of forage yields lost to stock in 1954.

Conclusions:

Nitrogen applied in the fall had no effect on grain yields. The highest forage yields were obtained from 120 lb. N applied in three applications. High forage yields did not reduce the grain yields.

C. E. Scarsbrook

Table 36 Rates of Seeding Grain Sorghum

Sand Mountain - 1947, 48 & 49

Variety	Rate of Seeding Lbs./A.[2]	Bushels per Acre			
		1947[1]	1948	1949	Av. 1947-49
Martin's Combine	4	37.6	31.9	14.0	27.8
Early Hegari	4	35.3	30.5	22.3	29.4
Martin's Combine	8	43.9	33.1	13.4	30.1
Early Hegari	8	52.4	33.6	20.3	35.4
Martin's Combine	12	41.4	30.1	13.9	28.5
Early Hegari	12	45.2	28.9	20.5	31.5
Martin's Combine	16	39.8	30.3	15.3	28.5
Early Hegari	16	31.1	25.6	17.4	24.7

[1] 1947 yields were obtained from the Grain Sorghum Spacing Test at Sand Mountain which is essentially the same test.

[2] Fertilizer applied at the rate of 600# of 6-8-4 per acre.

CONCLUSIONS:

(1) There was relatively little difference in yield due to rate of seeding.
(2) The data indicate that 4-8 pounds of seed per acre are adequate for top yields.

Table 37 The Effect of Rate of Nitrogen as a Side Application

on the Yield of Grain Sorghum

Upper Coastal Plain 1948-49

PROCEDURE:

Approximately 10 pounds seed planted per acre. Stand averaged 3-1/2 and 2-1/4 inches apart in the drill in 1948 and 1949 respectively. Rows were 3-1/2 feet apart. Fertilization: 300 lb./A. of 4-10-7 applied at planting. The rates of N shown below were applied the second cultivation. Ammonium nitrate was the source of N used. Each treatment was replicated three times.

Rate of N as a sidedress per acre	Yield - Bushels per Acre		
	1948	1949	Av. 1948-49
None	47.6	40.4	44.0
16# N.	52.7	42.4	47.6
32# N.	58.9	41.6	50.2
48# N.	55.6	44.1	49.8
64# N.	53.3	43.9	48.6

Table 38 Spacing and Rate of Nitrogen as Side Application on Grain Sorghum

Upper Coastal Plain - 1947-49

Average 1947-49

Per Acre Rate of N as Sidedressing	Yield in Bu. per Acre for Each Spacing			
	2-1/4"	4"	8"	12"
No N.	43.0	44.7	40.3	34.0
16# N.	44.5	48.4	44.9	37.2
32# N.	50.2	53.8	49.3	34.7
48# N.	53.4	57.8	50.3	38.7
64# N.	59.3	45.3	45.2	39.0

Planting: 10-12# seed per acre planted with tractor.

Fertilization: 1946 - 200# 6-8-4 per A. 1948-49 - 300# 4-10-7 per A. in drill at planting.

Thinning: Stalks pulled to desired spacing by hand.

Sidedressing: Ammonium nitrate at second cultivation at the rates indicated.

CONCLUSIONS:

(1) There was a definite (minor) response of grain sorghum to each added increment of nitrogen at all spacings with three exceptions. The exceptions were the 4 and 8 inch spacings at 64 pounds of N and the 12 inch spacing at 32 pounds of N.

(2) Four inch drill spacing gives highest yields at all levels of N. except 64 pounds per acre. In this case 2-1/4 inch spacing resulted in the highest yield.

Table 39 Grain Sorghum Spacing Test

Sand Mountain 1947-49

Variety	Row Width	Bushels per Acre			
		1947	1948	1949	Av. 47-49
Martin's Combine	3-1/2 ft.	47.8	48.9	11.8	36.2
Early Hegari	3-1/2 ft.	45.1	40.0	10.8	32.0
Martin's Combine	3 ft.	37.4	50.3	9.9	32.5
Early Hegari	3 ft.	46.2	29.8	14.9	30.3

Fertilizer applied at the rate of 600# 6-8-4 per acre, 8# of seed used per acre.

CONCLUSION:

(1) The data indicate that there is no advantage to 3 ft. row spacing over 3-1/2 ft. row spacing.

F. S. McCain

Table 40 Rates of Nitrogen Sidedressing on Grain Sorghum - Upper Coastal Plain
1948-1949

Rate of N Sidedressing:	Yield of Sorghum Bu./A		
	1948	1949	Avg. 1948-1949
None	47.6	40.4	44.0
16	52.6	42.4	47.5
32	58.9	41.6	50.3
48	55.6	44.1	49.8
64	53.3	43.9	48.6

300 lb. 4-10-7 applied at planting

CONCLUSIONS:
None

Table 41 Commercial Nitrogen in Addition to a Good Crop of Vetch on Corn

Upper Coastal Plain Substation

1949

Commercial N lb./A	Yield of corn bu./A
None	64.5
16	62.1
32	63.6
48	66.2

Pioneer 505 planted
300 lb. 4-10-7 applied at planting
Ammonium nitrate was source of nitrogen
15 inch spacing in 3 1/2 foot rows
About 15,000 lb. green weight of vetch turned

CONCLUSIONS:
Test not conducted long enough to draw conclusions.

Table 42 Rate of Topdressing Nitrogen on Oats-Upper Coastal Plain Substation

1945-1950

Rate of N	Yield of Oats Bu./A						Avg.
	1945	1946	1947	1948	1949	1950	1945-1950
None	13.6	10.7	17.0	32.8	31.9	23.7	21.6
16 lb.	27.9	26.8	28.7	61.6	57.9	34.0	39.5
32 lb.	44.8	35.2	46.0	71.6	67.8	43.4	51.5
48 lb.	64.8	38.5	57.9	75.7	89.8	60.2	64.5
64 lb.	1/	55.9	69.6	95.0	80.0	57.4	71.62/
80 lb.	1/	54.6	71.7	78.6	88.4	65.2	71.72/

225 lb. 4-10-7 applied at planting
Variety: Fulgrain
Soil Type: Atwood fine sandy loam

1/ Those rates not used in 1945
2/ Average 1946-1950

Table 43 Rates of Nitrogen Side Dressing and Spacing of Grain Sorghum
Upper Coastal Plain Substation - 1948-1949

N Side Dressing lb./A	Yield in Bu/A with a drill spacing of: 2 1/2"	4"	8"	12"	2 1/2"	4"	8"	12"
	1948				1949			
None	50.9	52.7	49.1	31.3	32.5	33.2	21.8	24.2
16	31.3	36.2	50.0	42.9	35.2	42.8	23.2	23.3
32	37.9	59.0	59.8	42.9	41.4	33.6	29.3	21.8
48	45.1	67.0	65.6	46.5	39.3	36.8	21.8	19.6
64	67.0	38.8	57.6	52.7	36.8	32.9	27.1	17.8

Planted in 3 1/2 foot rows
300 lb. 4-10-7 applied at planting to all plots
Nitrogen from sodium nitrate

CONCLUSIONS:
None

Table 44 Sources of Nitrogen for Oats - Upper Coastal Plain Substation
1945 - 1950

Source of N 1/	Yield of Oats Bu./A 1945	1946	1947	1948	1949	1950	Avg. 1945-1950
Ammonium Nitrate	46.0	46.5	46.0	77.8	76.8	51.6	57.5
Ammonium Sulfate	41.6	48.3	43.9	74.2	82.6	50.4	56.8
Uramon	34.7	38.6	41.6	77.0	68.1	44.3	50.7
Sodium Nitrate 1/2 Ammonium Sulfate 1/2	49.2	40.8	37.2	79.4	97.0	56.3	60.0
Sodium Nitrate	2/	44.5	42.3	79.3	80.5	57.4	60.8 4/
Cyanamid					70.1	36.8	53.5 5/

225 lb 4-10-7 applied at planting.
Variety: Fulgrain
Soil type: Atwood fine sandy loam

1/ 32 lb/A applied 1945 - 48, 48 lb applied beginning in 1949 - application made March 1.
2/ Not used until 1946
3/ Not used until 1949
4/ Average 1946 - 1950
5/ Average 1949 - 1950

CONCLUSIONS:
Ammonium nitrate, ammonium sulfate, sodium nitrate and a mixture of sodium nitrate and ammonium sulfate are equally satisfactory a source on oats but all these sources are superior to uramon and cyanamid.

Table 45 Time of Applying Nitrogen to Oats
Upper Coastal Plains-1945-50

Treatment	Date of Application	Yield of Oats Bu./A 1945	1946	1947	1948	1949	1950	Avg. 1945-50
32 lb nitrogen 1/	Feb 15	46.7	50.0	50.6	63.9	86.9	41.0	56.5
32 lb nitrogen 1/	March 1	46.4	53.8	42.1	70.9	72.4	39.4	54.2
32 lb nitrogen 1/	March 15	39.0	45.9	40.0	72.6	81.7	56.3	55.9
32 lb nitrogen 1/	April 1	28.5	39.0	40.2	62.8	59.4	48.1	46.3

225 lb 4-10-7 applied at planting
Soil type: Atwood fine sandy loam
Variety of oats: Fulgrain 1945, Victorgrain 1946
1/ Changed to 48 lb in 1949

CONCLUSIONS:
Feb. 15, Mar. 1 or Mar. 15 are equally satisfactory as dates of top dressing oats for grain. April 1 is too late to topdress for the best yields.
C. E. Scarsbrook

Table 46 Effects of Manure, Vetch, and Commercial Nitrogen and their Residues on Yields of Cotton and Corn

In 1925 an experiment was started at Auburn to compare the effects of 5 tons manure, vetch each winter, and 52 pounds of nitrogen from sodium nitrate annually on yields of cotton and corn in a two-year rotation. These treatments were applied for 18 years and discontinued for five years to determine their residual effect on yields. After the residual study all plots were planted in corn and received 80 pounds of commercial nitrogen from 1948 through 1955. Yields are presented in the table.

Table Summary of Cotton and Corn yields from Manure, Vetch, and Commercial Nitrogen and Their Residues, 1925 - 1955.

Treatment No.	Treatment	1925 - 42 1/		1943-47 2/		1948-55 3/
		Pounds Seed Cotton	Bushels Corn	Pounds Seed Cotton	Bushels Corn	Bushels Corn
1	No N	392	7.9	214	5.6	47.9
2	5 tons manure	1713	42.1	1027	29.0	52.8
3	325# $NaNO_3$	1442	38.6	468	14.4	50.0
4	Vetch	1358	32.8	524	16.0	50.0
5	No N	439	6.6	671 4/	24.2 4/	48.8

1/ All plots received 600 pounds of superphosphate and 100 pounds of muriate of potash per acre annually.

2/ Residue study 1942-47. All plots received 300 pounds of 0-14-10 annually.

3/ All plots were planted in corn and received 400 pounds of 4-10-7 and 200 pounds of ammonium nitrate.

4/ Treatment 5 received 225 pounds $NaNO_3$ from 1943 through 1947.

Manure produced 271 pounds more seed cotton and 3.5 bushels of corn more than did 325 pounds of $NaNO_3$ for the initial 18 year period. Vetch produced 84 pounds of seed-cotton and 5.8 bushels of corn less than did the $NaNO_3$. Average yields from vetch were low because of large fluctuations in amounts of vetch produced from year to year. Average yields of green vetch turned were 7000 pounds for cotton and 6351 pounds for corn. Yields of cotton and corn on plots which received only phosphorus and potassium were extremely low.

During the residual study, the effect of manure was outstanding. The average residual effect of manure for five years was 813 pounds of seed cotton and 23.4 bushels of corn. Sodium nitrate and vetch had about the same residual effect but much less than the effect of manure.

When 80 pounds of nitrogen was applied to all plots in 1948, yields were increased tremendously on all plots. Check plots which had averaged 6.3 bushels of corn for 23 years produced 50.6 bushels of corn in 1948. The effect of manure was still present in 1950, eight years after the last application.

J. T. Cope

Table 47 Seed Yield of Tall Fescue Fertilized With Different Rates of Nitrogen. Black Belt Substation. Average of 4 Replications 1951-1953

Pounds of Nitrogen per acre		Pounds of Seed per acre			
Sept. 1	Mar. 1	1951	1952	1953	3 yr. Average
0	0	86	93	217	132
48	0	153	131	385	223
0	48	162	263	400	275
16	32	177	164	396	246
32	16	148	130	381	220
32	32	144	194	452	263
0	64	180	301	456	312
48	48	212	233	606	350

CONCLUSIONS:

Fescue seed yields were influenced more by the total amount of nitrogen applied than they were by the time of application of nitrogen. Significant increases were obtained at each increased level of nitrogen but no differences were obtained within a given level due to splitting the applications between March and September.

E. M. Evans

Table 48 Tall Fescue Grazing Management Test - Black Belt Substation 1949-1950

Type of Management	Grazing periods and beef gains	
	Gain for Winter period-Lb./Acre	Gain for total period Lb./Acre
	11-29-49 to 3-27-50	11-29-49 to 9-23-50
Deferred Grazing	126	364
	11-29-49 to 3-27-50	10-3-49 to 9-23-50
Continuous Grazing	88	312

Table 49 Tall Fescue - Nitrate Grazing Management Test - Black Belt Substation - 1950 - 1951

Plot No.	Per Acre Nitrogen Treatment	Grazing Management	Grazing periods and beef gains in lb. per acre		
			12-1-50 to 4-2-51	4-3-51 to 8-27-51	Entire Period Grazed 1/
I	None	Deferred	- 89.5	127.5	38
II	200 lb. $NaNO_3$	Continuous	-122.5	112.5	8
III	None	Continuous	-127.5	55	-83.5
IV	400 Lb. $NaNO_3$	Continuous	- 60	92.5	75.5

1/ On the continuously grazed plots, the beef gains for the entire period include some gain prior to 12-1-50.

Table 50 Tall Fescue - Nitrate Grazing Management Test - Black Belt Substation 1951-1952

Plot No.	Per Acre nitrogen Treatment	Grazing Management	Grazing periods and beef gains		
			Winter	Spring and Summer	Entire Season
I	None	Continuous	-116.5	180	63.5
II	200 lbs. $NaNO_3$	Deferred	- 57.5	127	69.5
III	None	Deferred	- 75.5	130.5	55
IV	400 lb. $NaNO_3$	Deferred	72.5	108.5	181

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Table 51 Performance of Some Individual Steers on the Tall Fescue - Nitrate Grazing Management Test - Black Belt Substation 1950-52

Plot No.	Steer Designation	Weight Change by Periods		
		Winter - 1950	Spring and Summer 1951	Entire Season
I	Roan	+73	+110	+183
	Red	-117	+135	+ 18
II	2	- 60	+110	+ 50
	63 Winter only	-185	No. 1 +115	-70
III	64	-150	+ 30	-120
	27	-105	+ 80	- 25
IV	00	- 25	+ 40	+ 15
	1	- 95	+145	+ 50

		Winter - 1951	Spring & Summer 1952	Entire Season
I	1	-113	+ 200	+ 87
	16	-120	+ 160	+ 40
II	3	- 30	+ 132	+102
	22	- 85	+122	+ 37
III	9	- 73	+ 138	+ 65
	30	- 78	+ 123	+ 45
IV	36	+ 32	+ 98	+130
	8	+113	+119	+232

COMMENTS

An eight-acre fexcue-white clover pasture (2 years from establishment) was subdivided into two grazing plots and stocked with fairly uniform steers weighing around 1,000 pounds. The objective of the test at this time (1949-50) was to get some information on grazing management for fescue as a winter grazing crop. There was considerable white clover with the fexcue during this trial and the winter was mild. Gross results for the period are presented in Table 1.

The severe early-fall freeze in 1950 killed the grass back and practically eliminated the white clover. The pastures which had been divided again to make four 2-acre plots were being used for a nitrate- grazing management study. The purpose of nitrating was to stimulate growth of the grass so it would go into the winter with enough accumulated growth to last through the periods when no new growth would be made. About the time the grass had recovered from the hard freeze in the fall another severe freeze (this time in February) killed it back again. Needless to say, results for this period were not very favorable (see table 2).

The poor results (table 3) for the third year from the forage production standpoint can be attributed largely to drouth. The summer pastures during this

(CONTINUED ON NEXT PAGE)

period were so poor that the hay meadows were utilized for grazing rather than for hay. This is an unusual occurrence at this location.

The individual animal performance on this test (table 4) was very erratic and especially so during the 1950-51 period. Some of the steers, even though all were apparently quite uniform, were able to make much better use of the grazing than were others. The reason for this difference is not clear.

E. M. Evans

Table 52 THE EFFECT OF ORGANIC MATTER ON THE GROWTH AND ON THE DISEASES OF RUNNER PEANUTS AND BLUE LUPINE

Wiregrass - Tier 30 - 1947-51

Plot No. 1/	Treatment-#/A 2/	Yield of Peanuts Pound per Acre 1947	1948	1949	1950	1951	1947-51 Ave.
1	25000# Manure 450# Super	1614	2113	1597	1535	326	1437
2	900# Super 250# Muriate	1189	2011	1144	584	206	1027
3	900# Super 250# Muriate	1169	1931	1035	723	142	1000
4	12000# Oat straw 777# Super, 80# Muriate	1562	2175	1640	1231	226	1367
5	None	823	599	322	70	119	387

1/ All plots have lupines and peanuts grown on it each year except plot three which has only peanuts.

2/ Plots 1, 2, 3, and 4 have the same amount of P and K. Plots 1 and 4 have the same amounts of organic matter. Manure to be applied when lupines are turned. Oat straw to be applied in the fall on the lupines as a mulch. Superphosphate and muriate to be broadcast on plots 10 days to 2 weeks before planting.

SUMMARY: A marked response in yield was obtained from superphosphate and potash. The yields were further increased with the application of manure or oat straw. The manure application was only slightly superior to the oat straw application.

Fred Adams

Table 53 **ORGANIC MATTER AND FERTILIZER TEST**
with Peanuts Dug, Peanuts Hogged and Corn in a 3 Year Rotation

Wiregrass 1942-51 Tier 31

CROPPING: Corn, peanuts hogged, peanuts dug, oats for green manure crop. 4/

PAST HISTORY: The area was in dug peanuts without fertilizer from 1936 to 1941 inclusive.

Plot #	Fertilizer & Rate per/A	Yield - 10 year Averages - 1942-51: Peanuts Hogged: Pounds per acre	Peanuts Dug: Pounds/A	Shelled Corn: Bu. per Acre
1	0	802	1013	4.7
2 2	300# 0-8-12 3/	1027	1155	8.5
3	300# 0-8-12	1417	1339	10.0
4	0	1196	1232	6.0
5	300# 0-8-12 *	1530	1473	14.6
6	300# 3-8-12	1574	1595	16.0
7	0	1028	1142	5.8
8	300# 0-8-12	1587	1562	14.8
9	300# 3-8-12	1301 2/	1383 2/	17.7 2/

1/ One ton of lime per acre in 1942.

2/ A three year average as plot 9 was added in 1949.

3/ No oats on plot 2.

* Oats received 168 lbs/acre of sodium nitrate annually.

4/ The growth of oats was so small that no yield data were taken.

SUMMARY: The corn yield average was low, but the application of 300 lbs/acre of 0-8-12 or 3-8-12 more than doubled the yield. Lime had no effect on yield of corn. Peanut yields were increased by the addition of 0-8-12 or 3-8-12. There was a small, but doubtful, response to lime.

Fred Adams

Table 54 Yields of seed cotton in pounds per acre from acidity and availability of phosphorus experiment at Tennessee Valley Substation.

Treatment No.	Treatments 1/ Source of phosphorus	Source of nitrogen	Unlimed 6-yr. Ave. 1930-35	Unlimed 5-yr. Ave. 1936-40	Unlimed 5-yr. Ave. 1941-45	Unlimed 16-yr. Ave. 1930-45 2/	Limed 6-yr. Ave. 1930-35	Limed 5-yr. Ave. 1936-40	Limed 5-yr. Ave. 1941-45	Limed 16-yr. Ave. 1930-45
1	Check	$NaNO_3$	1300	1376	1388	1351	1772	1827	1827	1807
2	Monosodium phos.	$NaNO_3$	1611	1886	1729	331	2223	2293	2172	332
3	Monocalcium phos.	$NaNO_3$	1679	1948	1805	360	2261	2286	2270	397
4	Decalcium phos.	$NaNO_3$	1660	1934	1863	371	2199	2151	2150	243
5	Check	$NaNO_3$	1362	1550	1739	1539	1924	1911	1989	1940
6	Tricalcium phos.	$NaNO_3$	1751	1954	1948	435	2071	2066	2044	147
7	Superphos.	$NaNO_3$	1792	1985	1997	511	2259	2266	2172	318
8	Monoammonium phos.	$NaNO_3$	1720	1977	1922	463	2223	2244	2186	376
9	Check	$NaNO_3$	1339	1389	1590	1433	1719	1712	1881	1767
9 x	Check	$NaNO_3$	1313	1344	1444	1363	1518	1633	1550	1563
10	Monosodium phos.	$(NH_4)_2SO_4$	1813	1944	1811	369	2039	2031	1902	271
11	Monocalcium phos.	$(NH_4)_2SO_4$	1891	2100	1993	402	2069	2036	1989	290
12	Dicalcium phos.	$(NH_4)_2SO_4$	1911	2215	2117	516	1946	1992	1963	196
13	Check	$NaNO_3$	1538	1672	1857	1680	1874	1803	1819	1835
14	Tricalcium phos.	$(NH_4)_2SO_4$	1911	2009	2035	431	1909	1945	1955	184
15	Superphos.	$(NH_4)_2SO_4$	1871	1931	1954	273	2080	2078	2055	248
16	Monoammonium phos.	$(NH_4)_2SO_4$	1796	1812	1809	359	2041	2064	1947	305
17	Check	$NaNO_3$	1376	1287	1458	1374	1570	1577	1587	1578
Average of checks			1371	1436	1579	1457	1729	1744	1776	1748

1/ All plots received 36# and 24# potash. Limed tier received 75# marble dust in 1931.
2/ Increased yields over calculated checks for phosphate treatments

CONCLUSIONS:

Lime increased yield of checks by about 300# seed cotton. Lime decreased the availability of dicalcium phosphate and tricalcium phosphate. The same test was conducted at the Wiregrass Substation and results have been published in Agronomy Journal

L. E. Ensminger

Table 55 Response of Cotton to Rates of Concentrated Superphosphate and to Various Nitric Phosphates at 5 Locations

No.	Treatment[1] Kind	lbs. per Acre P_2O_5	Yield of seed cotton at 5 locations - pounds per/A: Rachel's Farm 1953	Rachel's Farm 1954	Tuskegee Exp. Field 1953	Tuskegee Exp. Field 1954	Traidt Farm 1953	Traidt Farm 1954	Haddock Farm 1953	Haddock Farm 1954	Moody Farm 1954	Average 9 location years
1	NK	0	477	396	1530	747	1515	1143	929	779	1019	948
2	NPK	24	787	1186	1719	909	1632	1228	986	916	1190	1173
3	NPK	48	835	1112	1710	909	1518	1375	932	889	1328	1179
4	NPK	72	778	1271	1710	932	1608	1346	950	893	1233	1191
5	NPK	72	832	911	1629	914	1582	1235	777	1044	1339	1140
6	14-14-14	24	533	916	1624	950	1443	1220	887	774	1238	1065
7	11-11-11	24	711	896	1480	788	1504	1136	970	929	1109	1068
8	15-15-15 (L.W. Sol. P)	24	774	1148	1710	963	1494	1181	1017	817	1262	1152
9	15-15-15 (H.W. Sol. P)	24	697	999	1656	873	1500	1123	911	860	1068	1076
10	14-11-11	24	705	1094	1732	891	1468	1213	880	803	1276	1118
	L. S. D. 5%		164	259		N.S.	N.S.	N.S.				
	ppm soluble S 0-6"		0		3		6		2		0	
	6-12"		5		115		5		90		48	
	12-18"								100		57	
	ppm P - Truog		2		8		13		13		3	
	ppm P - Bray No. 1		4		11		22		9		3	
	ppm P - $NaHCO_3$		3		9		8		8		4	
	Soil Type		Kalmia fsl		Boswell fsl		Norfolk sl		Cookville si.l		Dewey si.l.	

1/ All treatments except No. 5 received sufficient $CaSO_4$ to bring the applied S to 32 pounds per acre. Treatment No. 5 did not receive any sulfate.

Conclusions: There was a significant response to sulfate at the Rachel Farm the second year. There was a tendancy for the nitric phosphates to produce less cotton than an equivalent amount of P_2O_5 from CSP.

L. F. Ensminger

Influence of Rates of Phosphorus and Potash on Yields of Corn

Table 56 Fertilized with 80 Pounds of Nitrogen - 9 locations

Fertilizer 1000#/A	Average Yield of Corn in bushels per acre									
	Alexandria 1947-51	Alico-ville 47-54	Brewton 47-51	Monroe-ville 47-50	Pratt-ville 47-51	Tuskegee 47-51	Gulf Coast 47-54	Sand Mt. 47-54	Piedmont 47-51	Avg. 1/ & locations
8-0-6	52.8	38.0	48.6	53.9	41.9	27.2	58.9	65.9	49.4	49.4
8-2-6	53.3	40.7	55.0	53.4	48.1	32.5	62.2	68.9	47.9	52.3
8-4-6	57.4	39.9	54.0	54.0	51.4	33.9	63.0	69.7	47.3	53.1
8-6-6	54.3	40.1	55.3	53.4	53.0	33.3	63.2	68.0	44.9	52.6
8-6-4	57.6	41.8	55.6	52.2	53.2	31.9	66.2	68.3	45.7	53.6
8-6-2	55.0	40.9	54.0	51.0	51.2	32.8	61.1	69.4	51.9	52.8
8-6-0	55.0	36.9	50.2	52.0	49.7	30.4	57.6	65.5	54.5	50.7
8-8-8	54.3	41.4	54.3	53.4	52.8	36.1	65.7	69.2	52.8	54.3
8-12-6							64.5			
Average	55.0	40.0	53.3	52.9	50.2	32.3	62.5	68.1	49.3	52.4

1/ Weighted average

CONCLUSIONS:

At most of the locations corn showed little or no response to phosphorus or potash. Where some response to phosphorus was obtained the first 20# increment satisfied most of requirement. These data substantiate our present recommendations for minerals to corn.

L. E. Ensminger

Table 57 Response of Cotton to Various Phosphate Fertilizers and to Sulfate at 11 Locations

Treatment[1]	Yields of seed cotton-pounds per acre												
	Alexandria Field 1951-53	Alive-ville Field 1951-53	Frazer Farm 1951-53	Hall Farm 1951-54	Peoples Farm 1951-52	Jackson Farm 1951-53	Monroe-ville Field 1951-54	Brewton Field 1951-53	Waters Farm 1951-54	Peoples Farm 1951	Carpenter Farm 1951	Sears Farm 1951	Average 31 location years
K[2]	1308	1098	1421	962	670	1191	554	608	769	374	1043	997	925
PK[2]	1398	1089	1576	1151	863	1229	593	793	1123	693	1020	997	1067
-12-12	1442	1013	1648	1420	873	1321	1017	967	1451	711	1133	1150	1241
-14-14 (S free)	1367	935	1510	993	797	1230	645	671	1024	554	1020	1008	1001
-11-11	1597	1080	1567	1149	870	1374	902	833	1239	722	1163	972	1162
-9-9	1416	1081	1558	1244	1008	1234	968	862	1300	799	1020	783	1163
-7-7 (25% W.S. P_2O_5	1286	1152	1556	1164	871	1277	871	906	1238	691	1155	968	1130
-7-7 (63% W. S. P_2O_5)	1500	1141	1634	1326	863	1259	912	954	1336	950	998	1017	1204
ppm Truog soluble P	24	8	13	9	11	9	15	11	7	11	6	4	
ppm S in 0-6"	0	0	0	0		0	0	0	0				
6-12"	47	-	-	0		27	34	0	40				
12-18"	-	-	-	0		47	41	15	52				
il type	Decatur cl	Stough vfsl	Greenville fsl	Kalmia sl	Boswell vfsl	Magnolia fsl	Magnolia fsl	Kalmia fsl	Kalmia fsl	Boswell vfsl	Decatur cl	Norfolk ls	

fertilizers applied at base rate of 48 pounds each of N, P_2O_5, and K_2O.
eived 32 pounds S as $CaSO_4$

L. E. Ensminger

Table 58 Residual Effects of Phosphates as Measured by Crop Yields in a Rotation of Corn and Cotton with Winter Legumes

Sources of Phosphorus	P_2O_5 Applied to Cotton and to Winter Legumes 1930-45	Yields of Check Plots and Increased Yields During Residual Period. Averages 1946-49								
		Tennessee Valley Substation			Prattville Field			Wiregrass Substation		
		Green Wt. Vetch	Seed Cotton	Corn	Green Wt. Vetch	Seed Cotton	Corn	Green Wt. Lupines	Seed Cotton	Corn
	Lb.	Lb.	Lb.	Bu.	Lb.	Lb.	Bu.	Lb.	Lb.	Bu.
Check	0	2167	803	31.2	6950	1155	51.1	16096	631	33.3
Basid Slag	48	7628	457	27.3	7284	180	6.3	-701	382	5.6
Superphosphate	48	4804	325	18.8	5806	91	6.3	1137	137	5.2
Rock Phosphate	48	2578	128	9.7	4541	54	5.0	1011	124	4.2
Check	0	5840	1081	43.1	7537	1211	51.7	14102	441	23.1
Rock Phosphate	96	3496	249	10.5	7361	96	5.9	1426	215	4.2
Colloidal Phosphate	48	3179	145	9.4	7384	172	5.2	551	160	4.1
Ppt. Trical. Phos.	48	3644	201	13.8	8133	160	6.7	933	220	5.7
Check	0	3485	1080	37.6	6569	1169	49.9	14369	301	19.2
Triple Superphos.	48	3018	188	12.0	4703	67	7.4	-247	95	4.8
Ammo-Phos. A	48	3287	265	14.4	1331	-370	3.3	-272	-56	1.3
Superphosphate 1/	24	6224	244	13.2	6278	82	8.5	-265	206	5.3
Check	0	4424	1129	40.7	8631	1209	49.3	14467	468	25.9
Superphosphate	48	4526	242	26.5	5527	65	8.8	295	221	3.2
Superphosphate 2/	24	6235	329	24.3	8766	180	8.5	-940	352	5.6
Superphosphate	24	2117	255	16.7	4073	60	5.3	-1564	183	3.9
Check	0	1674	771	24.0	7475	1217	50.6	15834	603	30.1

1/ In addition to Superphosphate; rock phosphate applied at rate of 2000 pounds per acre in 1930, 1936 and 1942.
2/ In addition to Superphosphate, basic slag applied at rate of 2000 pounds per acre in 1930, 1936 and 1942.

Conclusions: All phosphates except ammophos. showed appraciable residual effects as indicated by vetch and cotton yields. Basic slag showed the highest residual effect of any of the phosphates. For a particular phosphate residual effects were in proportion to the amount which had been applied. Residual effects of triple superphosphate were not as great as for an equal amount of P_2O_5 from ordinary superphosphate.

L. E. Ensminger

Table 59A Residual Effects of Superphosphate as Measured By Yields of Cotton at the Sand Mountain Substation, Tier 24

Treatment No.	P_2O_5 Applied Annually 1930-34	P_2O_5 Applied Annually 1935-55	Yields of Seed Cotton per Acre 1930-34	1935-39	1940-44	1945-49	1950-55
	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	0	0	1031	741	383	253	445
2	30	0	1323	1097	707	417	559
3	60	0	1437	1192	999	706	763
4	90	0	1473	1294	1160	870	850
5	0	0	1022	835	535	268	460
6	120	0	1483	1299	1185	1120	1083
7	0	30	1029	1300	1323	1451	1370
8	30	30	1386	1405	1386	1515	1388
9	0	0	895	820	500	203	549
10	60	30	1346	1338	1334	1446	1358
11	90	30	1463	1424	1408	1476	1406
12	120	30	1445	1418	1343	1420	1396
13	0	0	1015	798	483	315	602
14	0	60	1077	1391	1436	1560	1458
15	30	60	1334	1356	1378	1452	1408
16	60	60	1445	1409	1473	1610	1424
17	0	0	1015	719	521	497	725

Note: From 1930-44 all plots received 36# N and 24# K_2O per acre. From 1945-54 all plots received 48# each of N and K_2O. In 1955 all plots received 72# N and 60# K_2O. Plots were limed at rate of 1500# in 1948 and agein in 1955.

CONCLUSIONS:

Residual effects of various rates of superphosphate added 1930-34 were appreciable first 5 years of residual period. Residual effects have decreased with time but still evident after 20 years. Test was completely revised beginning in 1956.

Table 59B Residual Effects of Superphosphate as Measured By Yields of Cotton at the Sand Mountain Substation Tier, 25

Treatment No.	P_2O_5 Applied Annually 1930-34	P_2O_5 Applied Annually 1935-55	Yields Seed Cotton/A 1930-34	1935-39	1940-44	1945-49	1950-55
	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	0	0	799	624	299	216	506
2	90	60	1403	1448	1422	1312	1412
3	120	60	1496	1476	1430	1354	1445
4	0	90	653	1395	1453	1387	1430
5	0	0	736	517	238	236	704
6	30	90	1249	1455	1454	1456	1442
7	60	90	1310	1425	1419	1484	1440
8	90	90	1393	1487	1478	1520	1448
9	0	0	646	461	304	275	806
10	120	90	1366	1472	1480	1520	1441
11	0	120	677	1479	1512	1556	1477
12	30	120	1341	1522	1519	1575	1428
13	0	0	738	580	361	310	844
14	60	120	1403	1540	1558	1587	1451
15	90	120	1488	1529	1556	1593	1426
16	120	120	1459	1508	1526	1583	1354
17	0	0	696	648	359	244	590

Note: From 1930-44 all plots received 36# N and 24# K_2O per acre. From 1945-54 all plots received 48# each of N and K_2O. In 1955 all plots received 72# N and 60 K_2O. Plots limed at rate of 1500# in 1948 and again in 1955.

L. E. Ensminger

Table 60 Residual Effects of Phosphates as Measured by Crop Yields in a Rotation of Corn and Cotton Without Winter Legumes

Sources of Phosphorus	P_2O_5 App'd: to Cotton 1930-45	Yields of Check Plots and Increased Yields During Residual Period Av.46-49: Tennessee Valley		Alexandria Field		Monroeville Field		Wiregrass Substation		Average Increases For all Locations	
		Seed Cotton: Lb.	Corn: Bu.	Seed Cotton: Lb.	Corn: Bu.	Seed Cotton: Lb.	Corn: Bu.	Seed Cotton: Lb.	Corn: Bu	Cotton: Lb.	Corn: Bu.
Check	0	883	36.8	653	27.2	781	28.0	574	21.1		
Basic Slag	48	372	6.1	438	6.6	571	7.9	249	2.8	407	5.8
Superphos.	48	280	4.9	427	6.3	484	6.9	133	0.3	331	4.6
Rock Phos	48	119	2.1	281	4.0	294	2.6	58	-0.2	188	2.1
Check	0	1090	41.9	913	36.7	926	30.1	499	20.7		
Rock Phos	96	230	1.8	418	5.8	285	4.9	133	2.3	266	3.7
Colloidal Phos.	48	209	2.2	—	—	155	3.7	99	3.5		
Ppt. Trical.Phos.	48	219	0.6	—	—	312	4.9	169	3.6		
Check	0	1036	43.4	—	—	904	28.6	462	16.6		
Triple Superphos.	48	196	0.6	—	—	171	5.3	29	2.6		
Ammo. Phos.	48	266	1.0	417	7.4	-102	5.8	-223	-0.2	89	3.5
Superphos.1/	24	224	2.5	435	3.2	261	3.5	136	1.3	264	2.6
Check	0	1169	41.9	832	33.2	1011	30.7	541	21.0		
Superphos.	48	231	2.5	406	4.1	438	5.3	215	1.3	322	3.3
Superphos.2/	24	332	4.9	474	5.9	517	6.9	256	2.2	395	5.0
Superphos.	24	174	5.8	360	6.1	378	7.4	104	-0.7	254	4.6
Check	0	878	35.4	509	22.7	730	26.2	437	21.6		

1/ In addition to superphosphate, rock phosphate applied at rate of 2000 pounds per acre in 1930, 1936 and 1942.
2/ In addition to superphosphate, basic slag applied at rate of 2000 pounds per acre in 1930, 1936 and 1942.

Conclusions: All phosphates showed appreciable residual effects as indicated by cotton yields. When the phosphates were applied at 48# P_2O_5 per acre, basic slag produced the most cotton during the residual period while ammonium phos. produced the least on the average. The low yields from Ammonium phos. applied to sandy soils are probably due to residual acidity from the material. The residual effect of a particular phosphate were in proportion to amount which had been applied.

L. E. Ensminger

Table 61 Yields of white clover from uniform rock phosphate test conducted at two locations in Alabama

Lime per Acre	Treatments: P_2O_5 per acre applied: CSP	Rock phos.	Frequency of applying phos.	Yields of dry matter per acre: Wickham fine sandy loam 1953	Wickham fine sandy loam 1954	Boswell fine sandy loam 1953	Boswell fine sandy loam 1954
lb.	lb.	lb.		lb.	lb.	lb.	lb.
2000	0	0	-----	3247	3811	1747	1102
2000	0	300	1st yr.only	3777	4670	1973	1422
2000	0	600	1st yr.only	4175	5147	2032	926
2000	300	0	1st yr.only	4588	5286	2582	1491
2000	30	0	Annually	4087	5351	1926	1217
2000	60	0	Annually	4365	5617	2236	1081
2000	120	0	Annually	4500	5832	2417	1447
2000	180	0	Annually	4506	5992	2718	1207
2000	75	300	1st yr.only	4107	5244	2286	1289
2000	150	300	1st yr.only	4400	5371	2306	1226
0	60	0	Annually	4317	4646	1993	1387
0	0	600	1st yr.only	4098	4769	2931	1306

CONCLUSIONS:

On limed plots clover responded to rock phosphate but it took only about a tenth as much P_2O_5 from CSP to give the same response. On the Wickham fsl, lime had little effect on response of clover to rock phosphate. However, on the Boswell fsl, the 1953 yields show that lime reduced the availability of rock phosphate.
L. E. Ensminger

Table 62 Response of Cotton to lime and phosphorus in varying amounts at Wiregrass and Tennessee Valley Substations.

Plot No.	Fertilizer 600# per acre	Lime lb./A per 10 yrs.	Avg. 34-37 T. V.	Avg. 34-37 W	Avg. 38-41 T. V.	Avg. 38-41 W	Avg. 42-44 T. V.	Avg. 42-44 W	Avg. 34-44 T. V.	Avg. 34-44 W	Avg. 34-44. All Loc.
1	6-10-4	0	1260	1368	1789	1286	1363	1482	1480	1369	1424
2	6-0-4	2106	1102	1293	1352	1104	1200	1277	1220	1219	1220
3	6-0-4	0	1091	1328	1250	1072	1119	1187	1156	1195	1176
4	6-2-4	2106	1200	1356	1663	1136	1327	1342	1363	1272	1318
5	6-10-4	0	1346	1440	1880	1218	1489	1424	1580	1355	1468
6	6-2-4	0	1230	1405	1612	1100	1324	1216	1395	1242	1318
7	6-2-4	2106 1/	1270	1365	1663	1157	1275	1333	1414	1280	1347
8	6-4-4	2106	1259	1420	1686	1128	1342	1385	1437	1304	1371
9	6-10-4	0	1357	1324	1843	1057	1468	1319	1565	1226	1395
10	6-4-4	0	1292	1412	1683	1123	1393	1330	1461	1285	1373
11	6-4-4	2106 1/	1295	1444	1728	1254	1382	1387	1476	1359	1418
12	6-6-4	2106	1299	1458	1739	1282	1367	1395	1479	1376	1427
13	6-10-4	0	1281	1456	1842	1232	1381	1401	1512	1359	1436
14	6-6-4	0	1227	1385	1749	1123	1358	1362	1452	1283	1368
15	6-8-4	2106	1268	1425	1800	1202	1419	1464	1502	1355	1428
16	6-8-4	0	1257	1432	1808	1282	1492	1411	1521	1373	1447
17	6-10-4	0	1317	1428	1916	1229	1498	1390	1585	1345	1465

1/ Lime applied to plots 7 and 11 once each 10 years. Applied in 1934 broadcast. None applied in 1944. All other lime plots receive 211# lime per year which equals 2106# total in 10 yrs. This lime is applied in drill with fertilizer.

CONCLUSIONS:

Response to phosphorus at T. V. was in order of 400# seed cotton. The response to phosphorus at Wiregrass was only about 200#. Lime had little or no effect on yields.

L. E. Ensminger

Table 63 Yields of Seed Cotton Produced by Various Phosphates with and without Lime

Treatments			Unlimed				Limed			
Source of phosphorus	Nitrogen Source	Lime	Wiregrass	Tenn. V.	Sand Mt.	Average of 3 locations	Wiregrass	Tenn. V.	Sand Mt.	Average of 3 locations
		lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Superphosphate	$(NH_4)_2SO_4$	212	979	1562	1354	1298	998	1714	1387	1366
Superphosphate	NH_4NO_3	101	1030	1611	1393	1373	1011	2018	1350	1500
Ammoniated Super.	NH_4NO_3	101	1020	1555	1368	1341	919	1775	1359	1390
Monoammonium Phos.	NH_4NO_3	134	823	1417	1314	1218	707	1445	1210	1176
Diammonium Phos.	NH_4NO_3	139	610	1518	1108	1121	876	1634	1306	1308
Diammonium Phos.	$NaNO_3$	82	906	1513	1352	1289	870	1542	1273	1261
Diammonium Phos.	Urea	139	811	1395	1201	1165	889	1535	1227	1247
Diammonium Phos. (Gypsum)	NH_4NO_3	139	1033	1546	1407	1356	1000	1616	1399	1369
Dicalcium Phos.	NH_4NO_3	60	885	1464	1319	1253	904	1532	1349	1294
Tricalcium Phos. 1/	NH_4NO_3	101	755	1413	1211	1160	747	1102	894	914
Rock Phosphate 1/	NH_4NO_3	0	612	1268	1082	1021	639	922	631	731
Diammonium Phos. 2/	NH_4NO_3	69	537	926	544	681	996	1928	1411	1486

1/ No phosphorus applied to limed tier.
2/ No phosphorus applied to unlimed tier.

Conclusions: Diammonium phosphate without lime was not a satisfactory material for sandy soils when used with $(NH_4)_2SO_4$. There was a response to gypsum without lime at Wiregrass and Sand Mountain Substations.

L. E. Ensminger

Table 64 Rates of Potash for Cotton - 10 Year Average Yield of Seed Cotton Where Various Amounts of Potash were Used, 1930-39 Sand Mountain, Tennessee Valley, Wiregrass, Aliceville

Continuous Cotton

Plot No.	Fertilizer[1]	Pounds per Acre.	Yield Seed Cotton per Acre - Lbs. Sand Mountain	Tennessee Valley	Wire-grass	Alice-ville[4]	Average
1	6-10-0	600	1041	1585	1243	978	1212
2	6-10-2	600	1328	1658	1371	1115	1368
3	6-10-4	600	1349	1576	1424	1142	1373
4	6-10-8	600	1348	1549	1463	1266	1407
5	6-10-0	600	1074	1436	1138	692	1085
6	6-10-16	600	1390	1457	1409	1278	1384
7	6-10-2	300	1023	1165	1059	881	1032
8	6-10-4	300	999	1162	1078	925	1041
9	6-10-0	600	1050	1307	1168	650	1044
10	6-10-8	300	1135	1190	1118	989	1108
11	6-10-16	300	1074	1250	1122	992	1110
12	6-10-16 [2]	600	1361	1495	1385	1146	1347
13	6-10-0	600	1129	1504	1150	705	1122
14	6-10-32 [2]	600	1330	1572	1435	1113	1363
15	6-10-4 Ammonium Sulfate	600	1267	1590	1345	1034	1309
16	6-10-4 Ammonium Sulfate[3]	600	1340	1639	1379	1047	1351
17	6-10-0	600	1146	1615	1144	870	1194

1/ Nutrients from superphosphate, muriate of potash, and nitrate of soda (except 15 & 16). All minerals and 1/4 of the nitrogen applied before planting cotton. Three-fourths of the nitrogen applied as a sidedressing. Beginning 1937 at Sand Mountain all fertilizer applied before planting.

2/ Potash applied once in each 4 year period.

3/ 200 pounds of limestone in drill annually.

4/ 2-Year average. Test started in 1938.

SUMMARY

This test was conducted with 18 and 36 pounds of nitrogen. At the 18 pound rate there was no appreciable response to 12, 24, and 48 pounds of K_2O over 6 pounds of K_2O per acre. At the 36 pound rate there was no response to potash at Tennessee Valley, response to 24 at Sand Mountain and 48 at Wiregrass and Aliceville. With higher nitrogen, responses might have been different.

R. D. Rouse

Table 65 Rates of Potash in a Two Year Rotation of Cotton and Peanuts
Wiregrass Substation (Tier 16) (1)
Cotton 1947, 49, 51, and 53
Peanuts 1948, 50, 52, and 54

Plot No.	Fertilizer 2/	Lbs/A	Cotton Yield 1947-49	Peanut Yield 1948-50	New Treatment 3/ 1951	Cotton Yield 1951-53	Peanut Yield 1952-54
1	6-8-8	600	168	1789	same	640	2028
2	6-8-2	600	209	2176	same	214	2030
3	6-8-4	600	209	2456	same	428	1857
4	6-8-8	600	475	2534	same	950	1794
5	6-8-8	600	218	2490	360 lbs. K_2O broadcast	1396	1515
6	6-8-16	600	618	2395	same	1571	1650
7	6-8-4	600	84	2315	same	742	1604
8	6-8-4	600	140	2286	same	636	1714
9	6-8-8	600	235	2290	same	662	1948
10	6-8-4	300	127	2119	600 lbs. 6-8-4 + 60 lbs. K_2O Sidedress	642	1570
11	6-8-8	300	280	2266	600 lbs. 6-8-8 + 60 lbs. K_2O sidedress	980	1436
12	6-8-6	600	250	2172	600 lbs. 6-8-16 + 60 lbs. K_2O sidedress	1250	1642
13	6-8-8	600	206	2142	360 lbs. K_2O broadcast + minor element mixtures	1495	1705
14	6-8-0	600	163	2132	same	132	1840
15	6-8-4	600	106	2042	same	313	1229
16	6-8-4	600	193	2534	same	370	1908
17	6-8-4	600	138	2284	same	504	2011

1/ This is on same area that was in rate of potash test continuous cotton 1930-39 and two year rotation cotton and peanuts from 1940-47. In 1947 plots 1,5,9,13, & 17 began receiving 48 lbs. of K_2O to cotton.

2/ Nitrogen from urea on all plots except 7 and 8 which get nitrate of soda, and 15 and 16 which get ammonium sulfate. Acidity of urea and ammonium sulfate corrected with dolomite on all plots except 8 and 15 which get no lime. Plot 7 gets same lime as on plots on which urea was used.

3/ All plots were limed at the rate of 1 ton dolomitic limestone per acre. Soil analysis showed very low calcium and pH values as well as potash. In addition to the lime treatments the additional potash treatments were made and peanuts began receiving 300 lbs. of 0-12-20 except plot 14 which received 300 lbs. of 0-12-0.

SUMMARY

Cotton Yields on all plots declined during the late 1940's in comparison with yield in adjacent experiments. This is indicated by a maximum yield of 618 pounds of seed cotton for a two year average 1947-49. In the winter of 1950 soil samples were collected and all plots had extremely low pH values, low exchangeable calcium, and low potassium even in the plots receiving biannual applications of 96 lbs. of K_2O. All plots were limed and all plots except one began receiving 60 lbs. of K_2O to peanuts and certain plots received additional potash. The lime in comparison with previous yields and adjacent experiments appeared to increase the yield of cotton on all plots. High rates of potash broadcast practically corrected extreme deficiency in one application. Minor elements were without appreciable effect.

Peanut Yields were not affected by potash treatment to cotton but one ton of lime was insufficient to bring the yield of peanuts up on the unneutralized ammonium sulfate plots.

R.D. Rouse

Table 66 Two Year Rotation of Cotton & Dug Peanuts
Four Year Average Cotton and Peanuts (1951-54)
Wiregrass Substation (Tier 17 & 18)

Plot No.	Treatment	# Peanuts/A.	Treatment 4/	# Cotton/A.
1	0-12-20 400	1343	4-10-7 600	1165
2	0-12-20 300	1421	4-10-7 5/ 600	1179
3	0-12-20 400	1264	4-10-7 5/ 600	1392
4	0-12-20 1/ 500	1360	4-10-7 600	1256
5	0-12-20 1/ 400	1244	4-10-7 1/ 600	1240
6	0-12-20 1/ 300	1261	4-10-7 1/ 600	1137
7	0-12-20 1/ 400	1244	4-10-7 1/ 2/ 600	1423
8	0-12-20 1/ 500	1234	4-10-7 1/ 600	1157
9	0-12-20 3/ 400	1392	4-10-7 600	1179
10	0-12-20 3/ 300	1343	4-10-7 600	1004
11	0-12-20 3/ 400	1378	4-10-7 600	1378
12	0-12-20 2/ 3/ 500	1358	4-10-7 600	1090
13	0-12-20 1-3/ 400	1065	4-10-7 1/ 600	1314
14	0-12-20 1-3/ 300	1336	4-10-7 1/ 600	1129
15	0-12-20 1-3/ 400	1309	4-10-7 1-5/ 600	1486
16	0-12-20 1-3/ 500	1314	4-10-7 1/ 600	1232
17	0-12-20 1-2/3/ 400	1276	4-10-7 1/ 600	1399

1/ 1 ton of lime per acre applied to these plots and worked in. To be repeated every 6 years.

2/ 100# of 60% muriate of potash applied as sidedressing to plot 17 as soon as peanuts are breaking ground.

3/ 500# of gypsum/A applied broadcast on these plots on peanut foliage over pegging zone at early blooming stage.

4/ Had an additional 100# ammonium nitrate per acre of 200# nitrate of soda side-dressed at chopping.

5/ 100# of 60% muriate of potash per acre side-dressed to these plots at chopping.

SUMMARY

Peanut Yields have not been affected by fertilizer treatment but there is an indication that yields were slightly reduced by lime.

Cotton Yields appears to be slightly better where peanuts received 400 or 500 pounds of 0-12-20 than those where peanuts received 300 pounds of 0-12-20. The most marked increase resulted from potassium side-dressing.

R. D. Rouse

Table 67 Effect of Rates of Application of Potassium on Yield of Cotton following Six Years of Alfalfa.

Tennessee Valley Substation

Treatment[1]	Yield[2] (Lbs. of Seed Cotton/A)			% K in leaf
	1950[3]	1949	1948	1950
6-8-0	845	1380	1720	0.48
6-8-4		1525	1685	
6-8-8	1395* [4]	1850* [4]	1848	0.75
6-8-20	1400* [7]	2135* [7]	1870 [5]	0.98
6-8-40	1460* [6][7]			0.96

1/ 600 pounds per acre.
2/ Average of 3 replicates except last two, which are single plots.
3/ No insect control measures were practiced in 1950.
4/ L.S.D. (5%) = 376 pounds of seed cotton per acre 1950 for potash treatment.
L.S.D. (5%) = 261 pounds of seed cotton per acre 1949 for potash treatment.
5/ 3-8-12
6/ This treatment was changed from 6-8-4.
7/ Only plots not showing K deficiency symptoms either in folage or ease of picking.

SUMMARY

Potassium deficiency symptoms on cotton following six years of alfalfa (that received about 200 pounds of K_2O in the six years) were corrected only by very high rates of potash. Rates of 120 lbs. repeated the second year or a single application of 240 lbs. of K_2O gave correction as measured by yield, potash content of leaves, picking quality, and deficiency symptoms. It appears when the exchangeable potassium in Decatur clay loam is cropped down to 200 lbs. K_2O per acre with alfalfa, severe deficiency exists. This was brought out in experiments conducted on C. C. King's farm in 1953 and 1955 (See annual reports).

R. D. Rouse

Table 68 Rates of Potash in a Two Year Rotation of Cotton and Peanuts
Four Year Average - 1941, 43, 45, 47 2/
Crop of Cotton

Yield of Seed Cotton per Acre - Lbs.

Plot No.	Fertilizer 1/	Lbs/A.	Sand Mountain	Tennessee Valley	Wire-grass	Aliceville	Average
1	6-8-0	600	555	1594	304	808	815
2	6-8-2	600	1104	1716	657	1055	1133
3	6-8-4	600	1499	1634	991	1228	1338
4	6-8-8	600	1641	1609	1173	1378	1450
5	6-8-0	600	750	1500	322	485	764
6	6-8-16	600	1579	1492	1208	1476	1439
7	6-8-4	600	1452	1367	908	1259	1246
8	6-8-4	600	1415	1280	983	1224	1226
9	6-8-0	600	664	1290	332	378	666
10	6-8-4	300	1190	1264	800	909	1041
11	6-8-8	300	1269	1344	1006	1151	1192
12	6-8-6	600	1590	1550	1100	1242	1370
13	6-8-0	600	659	1568	287	478	748
14	6-8-0	600	1451	1655	1129	1060	1324
15	6-8-4	600	939	1551	734	1107	1083
16	6-8-4	600	1377	1721	871	1216	1296
17	6-8-4	600	700	1590	258	768	829

1/ N from urea on all plots except 7 and 8 which get nitrate of soda, and 15 and 16 which get ammonium sulfate. Acidity of urea and ammonium sulfate corrected with dolomite on all plots except 8 and 15 which get no lime. Plot 7 gets same lime as on plots on which urea was used.

2/ Average on plots 1, 5, 9, 13, and 17 are three year averages 1941, 43, and 45. In 1947 these plots received 600# of 6-8-8; therefore, 1947 is not included for these check plots.

Rates of Potash in a Two Year Rotation of Cotton
And Peanuts. Four Year Average - 1940, 42, 44 and 46.
Crop of Peanuts

Plot No.	Fertilizer 1/	Lbs/A.	Pounds of Peanuts per Acre: Sand Mountain	Tennessee Valley	Wire-grass	Aliceville	Average
1			1024	1551	1490	1252	1329
2			1224	1562	1489	1277	1388
3			1362	1563	1577	1299	1450
4			1404	1476	1603	1466	1487
5			1042	1496	1453	1107	1274
6			1491	1503	1440	1466	1475
7			1132	1419	1363	1124	1260
8			1169	1342	1374	1210	1274
9			1041	1396	1462	1034	1233
10	6-8-4	300	1310	1363	1354	1206	1308
11	6-8-8	300	1344	1417	1344	1211	1329
12	0-0-10	600	1332	1577	1497	1464	1468
13			938	1501	1388	1031	1214
14			1360	1590	1515	1332	1449
15			956	1658	1400	1107	1280
16			1307	1560	1615	1212	1424
17			1061	1508	1514	1073	1289

1/ Plots 10, 11, and 12 received the fertilizer indicated in 1946 only. All other fertilizer applied to cotton as shown on cotton table.

(Continued on back)

SUMMARY

Cotton Yields appeared to be increased by the 96 pound increment of potash over 48 pounds, at Wiregrass and Aliceville. At Sand Mountain 48 pounds was adequate and no yield response was obtained on the Tennessee Valley soil.

Peanut Yields were increased as the rate of potash to cotton was increased up to 48 pounds of K_2O and decreased by the application of an unneutralized source of nitrogen (ammonium sulfate) to cotton at all locations except the Tennessee Valley where yields were not changed by treatment.

R. D. Rouse

Table 69 Effect of Potash and Minor Elements on Alfalfa Hay Yields -Aliceville 1946

Plot No.	Basic Slag Lbs./Acre	60% Muriate Lbs./Acre	Borax Lbs./A	Hay Pounds Per Acre: 1st Cutting	2nd Cutting	3rd Cutting	Total
1	4000	200	30	3074	2819	2697	8590
2	4000	400	30	3988	3637	2140	9765
3	4000	400	30 1/	4234	3793	2262	10289
4	4000	200	30	3815	3254	2384	9553
5	4000	400	30	3930	3480	2523	9933
6	4000	400	30 1/	3988	3271	2227	9486
7	4000	200	30	4350	3028	1914	9292
8	4000	400	30	3770	3062	2210	9042
9	4000	400	30 1/	3872	3062	1827	8761
10	4000	200	30	4263	2645	2001	8909
11	4000	400	30	4176	2849	1879	8804
12	4000	400	30 1/	4060	2958	2036	9054

1/ These plots had 30# $MnSO_4$, 10# $ZnSO_4$ and 10# $CuSO_4$ per acre applied Jan. 29, 1946.

Fertilization: In addition to the fertilizer applied in the beginning, the annual application of fertilizer per acre is 1000# basic slag, 100# of 60% muriate of potash applied:

to plots 1, 2 and 3 in February
4, 5 and 6 after the first cutting
7, 8 and 9 after the second cutting
10, 11 and 12 after the third cutting

CONCLUSIONS:

No definite conclusions can be made from the test.

D. G. Sturkie

Table 70 Corn After Kobe Lespedeza - Terrace 27

Alexandria Experiment Field, 1943

Objective: To determine fertilizer needs of corn following Kobe Lespedeza.

Treatment: Kobe was planted on this area in spring of 1941. Hay was harvested from the area in this year. In 1942, the lespedeza was allowed to grow until fall. In early November, seed were saved with seed pan on mower (about 200# of uncleaned seed harvested per acre). Straw was stacked in pasture to winter cattle.

On November 11, 1942, the land was hard bedded with 12" middle buster. All fertilizer was applied in drill by hand and bedded on immediately before planting. Rows were opened with scooter and Johnson wings and corn was planted May 7. All plots were two-row plots, 7' x 311' or 1/20 of an acre.

This same test was conducted on an adjacent area in 1942. The yields and fertilizer treatments for both years are given below:

Plot No.	Fertilizer Treatments acre basis	Bushels of Corn per Acre 1942	1943	Average 1942-43
1	No fertilizer	27.0	22.5	24.7
2	300# of 0-16-0	36.0	31.2	33.6
3	300# of 0-16-16	46.4	44.7	45.5
4	300# of 0-16-16 + minor elements	47.9	45.9	46.9
5	300# of 6-16-16 + minor elements	46.8	45.3	46.0
6	No fertilizer	30.2	18.1	24.1

Note: All plots receiving no potash showed potash deficiency.

Table 71

Value of Side-dressing Corn with Potash Following Kobe Lespedeaz - Terrace 27

Objective: To determine the value of side-dressing corn with potash following kobe lespedeza.

Treatment: See Corn After Kobe Lespedeza test for management of lespedeza preceding corn in this test. Corn was planted May 7. A poor stand came up and it was replanted May 19. Approximately 400# of superphosphate per acre applied in drill before planting. The corn came up and grew off rather slowly. During latter part of June and first of July, a very marked potash deficiency began to show up. It was decided to side-dress the corn with potash. On July 8, the corn was side-dressed with approximately 100# of 60% muriate of potash per acre. A few rows through the field were left untreated. Yields from this test are given below:

Corn, not side-dressed - - - - - - - 19.8 bu. per acre
Corn, side-dressed with
100# potash per acre - - - - - - - 25.6 bu. per acre

Four harvests of 1/120 acre each were taken from each area to obtain yields. It is believed that if potash had been applied earlier a greater increase from its use would have been made. It may also have been possible to correct this deficiency by using a smaller application of potash. Soon after potash was applied the corn plants changed from their potash deficient color to a deep natural green color and picked up rapidly in their growth. This indicates the possibility of correcting potash deficiency in corn after the deficiency is apparent in the plant.

R. D. Rouse

Table 72 *Effect of Lime and Potassium on Yield of Dixie Runner Peanuts*[1]/
Auburn, Alabama - 1950-1954

Treatment lbs/A		Yield of Peanuts pounds per acre					5 year average
Lime	K_2O	1950	1951	1952	1953	1954	
0	0	2890	1744	2028	2041	38	1748
0	25	3200	1535	2734	2709	45	2045
0	50	3199	1826	3028	3113	60	2245
0	100	3251	1482	3225	2329	28	2063
2,000	0	3217	1395	2275	2321	89	1859
2,000	25	3360	1598	2725	2997	181	2172
2,000	50	3970	1842	2715	3058	259	2369
2,000	100	3628	1800	3318	3403	139	2458
4,000	0	3485	1444	2306	1852	83	1834
4,000	25	3621	1800	2900	2819	264	2281
4,000	50	3583	1636	2756	2940	221	2227
4,000	100	3390	1680	3169	3333	390	2392

Table Effect of Lime and Potassium on Yield of Peanut Vines.[1]/
Auburn, Alabama

Treatment lbs/A		Yield of Peanuts Vines lbs/A (dry wt.)					
Lime	K_2O	1950	1951	1952	1953	1954	Average
0	0	5750	3003	3534	4922	2310	3904
0	25	5156	3136	4783	4798	3105	4196
0	50	5782	3214	5261	5483	3780	4704
0	100	5000	3154	6144	6420	3960	4936
2,000	0	5406	2631	4357	4520	2640	3911
2,000	25	4562	2862	4326	4500	3090	3868
2,000	50	5156	3678	5525	5641	3555	4711
2,000	100	5500	3233	6134	5754	3630	4850
4,000	0	6000	2809	4236	3427	2100	3714
4,000	25	6313	2426	4733	4732	2925	4226
4,000	50	6031	3188	5728	5420	3585	4790
4,000	100	6750	3299	6398	5582	4230	5252

1/ Lime applied in 1946 as marble dust and the 2 ton treatment received an additional 1/2 application in 1952. All plots received 12 pounds of N, 60 lbs. of P_2O_5, and 12 pounds of MgO per acre annually.

Table Effect of Lime and Potassium on percentage Sound Mature Kernels of Dixie Runner Peanuts - Auburn, Alabama

Treatment lbs/A		% Sound Mature Kernels					
Lime	K_2O	1950	1951	1952	1953	1954	5 year average
0	0	65	56	63	59	49	58
0	25	65	51	67	62	45	58
0	50	67	49	67	63	46	58
0	100	67	46	64	55	44	55
2,000	0	68	56	67	61	51	60
2,000	25	71	57	65	66	57	63
2,000	50	69	53	66	63	60	62
2,000	100	68	54	63	66	57	61
4,000	0	70	57	64	62	61	63
4,000	25	69	56	65	67	65	64
4,000	50	68	59	68	65	58	63
4,000	100	67	58	65	66	58	63

CONCLUSIONS:

The yield of peanuts and peanut vines along with annual soil and plant analysis offer positive proof that previous findings obtained on the Wiregrass Substation and Farmer Fields are correct. In 1950 the exchangeable calcium on the no lime plots averaged about 750 lbs. calcium carbonate equivalent per acre and the response to lime was relatively small. By 1953 the exchangeable calcium had decreased to about 400 lbs. calcium carbonate equivalent and response to lime amounted to 1000 pounds of peanuts at high potash. The study shows that about 75 pounds exchangeable K_2O per acre is the dividing line between slight response and major response and when the exchangeable potash is lowered to about 50 pounds per acre yield is severely limited.

The data also shows the importance of the amount and balance of lime and potash on percentage sound mature kernels.

R. D. Rouse

Table 73 The results of an experiment on maintaining soil fertility and crop production on soils cropped with harvested peanuts.

The experiment was conducted in bins 1/100 acre in size. The soil was Norfolk sandy loam. The soil was composited and placed in the bins before the experiment was begun. All treatments are in triplicate. The results shown are the average for all replications. In all cases the peanuts have had treatment of 10-90 peanut dust to control leaf spot and DDT when needed to control insects. Dixie Runner peanuts were grown each year

Outline of Treatments Used

Treatment Number	Kind
1	No fertilizer, lime or other treatment
2	PK
3	PKL
4	PKL B. S.
5	PKL G.
6	PKL G. All P and K broadcast before planting
7	PKL G. All P and K in the row ahead of planting
8	PKL G. Peanut vines returned to the land.
9	PKL G. Plus 64 pounds N annually
10	PKL G. Plus 2000 pounds 0-16-8 every 3 years.
11	PKL G. Plus minor elements annually, plus 2000 pounds 0-16-8 every 3 yrs.
12	PKL G. Plus 3 tons of corn stalks every 2nd year.
13	PKL G. Plus 6 tons of corn stalks every 2nd year.
14	PKL G. Plus 12,500 pounds green legumes annually.
15	PKL G. Plus 25,000 pounds green legumes annually.

PK = 400 pounds of 0-16-8 bedded on 10 days to 2 weeks ahead of planting plus 88 pounds of K_2O as muriate of potash as side dressing after the plants emerge except on treatments 6 and 7.

L = 2000 pounds of dolomite broadcast at the beginning of the experiment and every 6 years thereafter.

G = 400 pounds of gypsum applied as top dressing at beginning of blooming.

BS = 400 pounds of basic slag applied as top dressing at beginning of blooming.

N = nitrogen from ammonium nitrate at same time K_2O is added as a side dressing.

Minor elements = 5 pounds borax, 5 pounds copper sulfate, 15 pounds zinc sulfate and 25 pounds manganese sulfate.

The 2000 pounds of 0-16-8 every 3 years should be broadcast ahead of turning the soil when the plots are prepared.

Corn stalks were cut into short lengths and put on top of the soil in the fall soon after peanuts were removed.

D. G. Sturkie

Table 74 The results obtained in experiment on maintaining soil fertility on soils cropped with harvested peanuts. (See previous page for treatments).

Treatment No.	Yield per acre of Sound Mature Kernels in lbs/A						
	1950	1951	1952	1953	1954	1955	6 yr. average 1950-55
1	1772	1051	1685	1027	197	583	1052
2	1711	952	1489	1074	280	718	1037
3	1856	881	1461	1771	278	1191	1240
4	1916	1103	1412	2043	279	1522	1379
5	1830	931	1603	1793	333	1337	1304
6	1722	1086	1615	2029	354	1494	1383
7	1835	1120	1778	1849	318	1144	1341
8	1971	1046	1333	1979	258	1461	1341
9	1868	1159	1546	1797	314	1445	1355
10	1752	874	1635	1795	279	1190	1254
11	1722	1028	1518	1679	299	1138	1231
12	1978	1343	1723	1802	303	1416	1428
13	2103	1190	1547	2168	352	1701	1510
14	1891	1150	1778	2101	328	1547	1466
15	1998	1233	1915	2135	229	1074	1431
Average	1862	1076	1603	1803			

D. G. Sturkie

Table 75A

KINDS AND RATES OF LIME IN 2 YEAR ROTATION AT FOUR LOCATIONS

(Cotton-Winter Legume-Corn and Summer Legume)

POUNDS SEED COTTON PER ACRE BY 10 YEAR PERIODS 1930-49

Plot No.	Treatment 600# 1/	Dolomite Lime	Prattville 30-39	Prattville 40-49	Sand Mt. 5/ 30-39	Sand Mt. 5/ 40-49	Tenn. Valley 6/ 30-39	Tenn. Valley 6/ 40-49	Wiregrass 7/ 30-39	Wiregrass 7/ 40-49	30-49
1	6-8-4	0	1340	1482	1411	1268	1290	1279	1718	1582	1054
2	6-8-4	200 2/	1405	1451	1428	1461	1495	1478	1727	1693	1218
3	6-8-4	1000 3/	1408	1508	1458	1506	1492	1499	1707	1707	1204
4	6-8-4	400 2/	1486	1608	1547	1558	1530	1544	1761	1733	1157
5	6-8-4	0	1370	1398	1384	1435	1409	1422	1668	1766	978
6	6-8-4	2000 3/	1413	1499	1456	1545	1449	1497	1688	1714	1020
7	6-8-4	600 2/	1418	1516	1467	1514	1440	1477	1668	1726	1012
8	6-8-4	3000 3/	1417	1523	1470	1489	1373	1431	1662	1706	954
9	6-8-4	0	1349	1357	1353	1467	1445	1456	1651	1679	817
10	6-8-4 (Cal.)	200 2/	1387	1469	1428	1500	1528	1514	1651	1713	971
11	6-8-4	1000 3/	1405	1463	1434	1529	1521	1525	1716	1740	1022
12	6-4-4	3000 3/ 4/	1356	1490	1423	1358	1292	1325	1667	1665	1030
13	6-8-4	0	1400	1434	1417	1342	1342	1342	1705	1683	989
14	6-4-4	0	1337	1407	1372	1217	1229	1223	1612	1482	990
15	6-8-2	3000 3/ 4/	1373	1353	1363	1297	949	1123	1683	1681	1050
16	6-8-2	0	1389	1295	1342	1370	1154	1262	1703	1641	1051
17	6-8-4	0	1437	1503	1470	1400	1342	1371	1718	1530	1145
Ave. of Checks (1,5,9,13,17)			1379	1435	1407	1382	1366	1374	1692	1648	997

1/ Fertilizer applied at the rate of 600# per acre of formula shown. (Plus enough lime to make a neutral fertilizer from 1940-49) 6-10-4 instead of 6-8-4 applied as basic rate previous to fall of 1934. From 1930-37 1/4 nitrogen applied under cott and 3/4 applied as a side-dressing. (All N from ammonium sulfate). From 1938 to 194 all N, P, and K applied under at planting.

2/ Lime applied in drill every two years to cotton from 1930 to 1939. Applied in drill every two years to winter legumes from 1940-49.

3/ Lime applied broadcast once each 10 years (1930 and 1940).

4/ 1000 pounds lime applied broadcast on plots 12 and 15 in 1930. Changed to 3000 pounds applied broadcast in 1940.

5/ Sand Mountain: Because lack of potash appeared to be limiting yields, the potash applied to cotton was doubled in 1944 and 1945. After 1945 cotton gets normal rate of potash.

6/ Beginning in 1943 the nitrogen is omitted to cotton at Tennessee Valley. (0-8-4 applied as basic treatment after 1942).

7/ Wiregrass: Beginning in 1945 the basic rate of fertilizer to cotton is equivale to 600# of 0-8-8 to all plots except 12, 14, 15, and 16. Plots 12 and 14 get double the basic rate of potash, and plots 15 and 16 get 1/2 basic rate of potas

SUMMARY: All rates of lime gave increased yields of cotton at all locations. There was little difference between calcitic and dolomitic lime except at Wiregra where the dolomitic was superior. The optimum rate appeared to be 400 lbs per acre biennially except at the Wiregrass where 200 lbs./acre biennially was best. The highest rates of lime decreased the yields at Wiregrass, and Sand Mountain. The greatest response to lime was obtained at Wiregrass (about 200 lbs/acre of seed cotton) and the lowest at Tennessee Valley.

Fred Adams

Table 75B Kinds and Rates of Lime in 2 Year Rotation at Four Locations

(Cotton-Winter Legume-Corn and Summer Legume)
Winter Legumes[7] per acre (Green Wt.) by 10 year periods 1930-49

Plot No.	Treatment: 600# of 1/ A	Dolomite: Lime	Prattville 31-40	Prattville 41-50	Prattville 31-50	Sand Mountain[5] 31-40	Sand Mountain[5] 41-50	Sand Mountain[5] 31-50	Tennessee Valley 31-40	Tennessee Valley 41-50	Tennessee Valley 31-50	Wiregrass[6] 31-40	Wiregrass[6] 41-49	Wiregrass[6] 31-49
1	0-8-0	0	8677	9743	9210	2160	5130	3645	8838	9686	9262	5029	9285	7045
2	0-8-0	2002/	10876	11984	11430	5478	8384	6931	9600	11632	10616	7846	11205	9437
3	0-8-0	10003/	13677	12457	13067	5849	8441	7145	9546	11380	10463	7693	12648	10040
4	0-8-0	4002/	13961	12537	13249	6483	8857	7670	10031	12463	11247	7637	11454	9445
5	0-8-0	0	10652	12682	11667	4443	6675	5559	8706	11234	9970	4679	9693	7054
6	0-8-0	20003/	14318	12416	13367	7361	8987	8174	10988	12172	11580	8117	11634	9783
7	0-8-0	6002/	14164	11816	12990	6737	8853	7795	10025	12503	11264	7669	11230	9356
8	0-8-0	30003/	13880	11562	12721	7404	8934	8169	10905	12797	11851	7877	11358	9526
9	0-8-0	0	10475	12245	11360	3232	6646	4939	8740	10654	9697	4568	8193	6285
10	0-8-0	Calcitic 2002/	12172	12730	12451	4780	8154	6467	9964	11080	10522	6446	10200	8224
11	0-8-0	10003/	12900	12880	12890	4919	8447	6683	10245	12103	11174	6535	11051	8674
12	0-4-0	30003/	12108	10950	11529	2882	5732	4307	8407	10369	9388	6404	11576	8854
13	0-8-0	0	11005	12547	11776	2776	5668	4222	9600	10900	10250	4575	9490	6903
14	0-4-0	0	10234	11604	10919	2082	4150	3116	7155	8623	7889	4081	9173	6493
15	0-8-0	30003/4/	13241	11799	12520	5028	7560	6294	9862	12114	10988	7194	11750	9352
16	0-8-0	0	11118	11472	11295	3669	6075	4872	9361	11163	10262	5404	8930	7074
17	0-8-0	0	9558	10636	10097	2557	5565	4961	9665	9737	9701	5274	8977	7028
Ave. of cks 1,5,9,13, 17			10073	11571	10822	3034	5937	4485	9110	10442	9776	4825	9128	6863

1/ All vetch plots receive at time of planting superphosphate equivalent to 600# of the formula shown, first applied in fall of 1934. (Equivalent to 48# P_2O_5/A.)

2/ Lime applied in drill every 2 years to winter legumes from 1940-49. Applied in drill to cotton from 1930-39.

3/ Lime applied broadcast once each 10 years (Continued on Back of page)

4/ Lime on plots 12 and 15 was 1000# applied broadcast in 1930 changed to 300# applied broadcast in 1940.

5/ Sand Mountain-the winter legumes get the normal rate of potash at Sand Mountain beginning in 1944. (That is 24# K_2O on all plots except 15 and 16 which get 12# K_2O/Acre.)

6/ No fertilizer or lime to winter legume at Wiregrass beginning in fall of 1945. 19 year average at Wiregrass.

7/ A.W. Peas 1931-33) Prattville A. W. Peas 1931) Sand Mt. Vetch-Tennessee Valley-1931-50
Vetch 1934-50) Vetch 1932-50)

A.W. Peas 1931-33)
Vetch 1934-42) Wiregrass
Blue Lupine 1943-49)

SUMMARY: The growth of winter legume cover crops was increased considerably by lime at all locations, with the highest increases occuring at Sand Mountain and Wiregrass.

Fred Adam

Table 75C KINDS AND RATES OF LIME

ON 2 YEAR ROTATION AT FOUR LOCATIONS

(Cotton-Winter Legume-Corn and Summer Legume)

BUSHELS CORN PER ACRE BY 10 YEAR PERIODS 1930-49

Plot No.	Treatment[1] Dolometic Lime/A	Prattville			Sand Mountain			Tennessee Valley			Wiregrass
		1930-39	40-49	30-49	1930-39	40-49	30-49	1930-39	40-49	30-49	1930-40[5]
1	0	34.7	49.5	42.1	20.7	35.3	28.0	38.2	51.6	44.9	27.3
2	200[2]	36.8	51.2	44.0	30.3	50.3	40.3	39.0	52.6	45.8	29.3
3	1000[3]	38.2	52.0	45.1	32.6	51.6	42.1	38.6	52.2	45.4	29.4
4	400[2]	37.7	51.7	44.7	34.3	53.9	44.1	38.9	54.1	46.5	27.8
5	0	33.5	50.1	41.8	28.7	44.5	36.6	38.5	54.1	46.3	25.2
6	2000[3]	38.1	50.9	44.5	34.9	53.3	44.1	40.3	55.1	47.7	27.2
7	600[2]	37.3	49.3	43.3	34.3	53.5	43.9	39.0	52.8	45.9	25.8
8	3000[3]	36.5	49.5	43.0	35.9	55.3	45.6	40.4	53.4	46.9	25.7
9	0	34.9	49.3	42.1	25.8	45.0	35.4	38.9	51.7	45.3	21.6
10	Calcitic 200[2]	36.0	52.4	44.2	30.6	52.4	41.5	37.1	50.9	44.0	26.3
11	1000[3]	37.1	51.9	44.5	32.6	53.0	42.8	39.3	51.9	45.6	26.3
12	3000[3][4]	37.8	51.8	44.8	25.0	46.0	35.5	38.2	54.0	46.1	26.7
13	0	37.9	51.7	44.8	23.2	39.6	31.4	37.4	50.8	44.1	26.5
14	0	36.2	49.4	42.8	23.1	34.5	28.8	36.2	49.8	43.0	27.1
15	3000[3][4]	37.7	50.7	44.2	32.0	50.6	41.3	38.8	52.8	45.8	30.6
16	0	37.4	49.6	43.5	29.2	44.4	36.8	39.4	51.6	45.5	29.5
17	0	36.3	50.7	43.5	24.3	37.5	30.9	36.9	49.1	43.0	29.1
Ave. of Cks. (1,5, 9, 13, 17)		35.5	50.3	42.9	24.5	40.4	32.5	38.0	51.5	44.7	25.9

[1] Corn receives no fertilizer of any kind.

[2] Lime applied in drill to cotton from 1930-39 once every 2 years. Applied to winter legumes from 1940-49.

[3] Applied broadcast once each 10 years.

[4] Lime on plots 12 and 15 was 1000# broadcast in 1930. 3000# broadcast in 1940.

[5] Corn in this experiment discontinued after 1940 at Wiregrass and peanuts used in place. This is an 11-year average.

Conclusions: The corn yields for the second ten-year period were considerably higher than the first period. An average 10-to-15 bushel increase during 1940-49 was obtained at Sand Mountain from lime applications. There was a slight response to lime at Prattville and Tennessee Valley. The highest lime rates depressed the yields at Wiregrass and at Prattville. Corn yields were increased slightly by the low rates of lime at Wiregrass. Dolomitic lime was superior to calcitic lime only at the [illegible] Wiregrass

Fred Adams

Table 75D KINDS AND RATES OF LIME IN TWO YEAR ROTATION

(Cotton - Winter Legume - Corn and Summer Legume)

Wiregrass Substation

Peanuts substituted for corn and summer legume beginning in 1941

POUNDS OF PEANUTS PER ACRE FOR 9-YEAR PERIOD

Plot number	600#/A of[1/]	Average 1941-49
1	0-8-4	1819
2	0-8-4	1872
3	0-8-4	1836
4	0-8-4	1814
5	0-8-4	1804
6	0-8-4	1507
7	0-8-4	1494
8	0-8-4	1416
9	0-8-4	1736
10	0-8-4	1722
11	0-8-4	1727
12	0-8-4	1464
13	0-8-4	1857
14	0-8-4	1688
15	0-8-2	1579
16	0-8-2	1812
17	0-8-4	1886
Avg. of checks, 1, 5, 9, 13, 17	0-8-4	1820

1/ Apply lime in drill to peanuts in the drill (1945-49) as formerly to legumes (1940-44) Lime applied to cotton from 1930-39. Refer to table of cotton yields for detailed liming treatments.

SUMMARY: The yields of peanuts was reduced on the application of lime with the greater reduction occurring with the higher lime rates.

Fred Adams

Table 75E KINDS AND RATES OF LIME IN TWO YEAR ROTATION
(Cotton-Winter Legume-Corn and Summer Legume)

AVERAGE-SUMMER LEGUMES IN CORN

Plot:	Soybeans Green Weight-Pounds/Acre			Crotalaria Green Weight-Pounds/Acre			
No.	Prattville : 1931-34	Sand Mt. : 1930-34	Tenn. V. : 1930-34	Prattville[1] : 1937-45	Sand Mt.[2] : 1936-45	Tenn.V[3] : 1937-45	Wiregrass[4] : 1938-40
1	6548	2985	7027	2924	2176	2596	2113
2	7787	4142	7828	2852	1917	2105	1801
3	8478	4815	7328	3229	2092	2896	2047
4	8431	5216	7979	3444	2235	3127	2374
5	7668	4763	7599	1541	1888	2772	2280
6	8408	5388	8326	3137	1958	3220	2301
7	8575	5349	8465	3114	2174	3233	2185
8	9061	5858	8775	2877	2294	3125	2454
9	7173	4555	7699	1488	1920	2848	1612
10	7911	4782	8318	2234	1809	2958	2679
11	8206	5437	8168	2407	1896	2876	2004
12	8624	4304	7990	3239	2135	3171	3419
13	7623	4109	7536	1823	1932	2908	2316
14	7175	3638	6908	2441	1749	3150	1561
15	9432	4929	7601	3949	2021	3052	2766
16	8089	3539	7606	2826	1555	2700	1837
17	7711	3327	7207	4138	2216	2768	1699
Ave.1, 5, 9, 13 17	7345	3948	7414	2383	2026	2778	2004

1/ No summer legume planted in 1935-36.

2/ No summer legume planted in 1935.

3/ No summer legume planted in 1935. No yield record of crotolaria taken in 1936 because of weed infestation.

4/ Soybeans failed in 1930 and 1932. Velvet beans failed in 1931. Peanuts planted in 1933-34 but no yields measured. No summer legume planted in 1935-37. Peanuts planted without corn after 1940 and results are found in separate table.

SUMMARY: Lime applications increased the yield of Crotalaria slightly in most cases. Soybean hay yields were increased at all locations with the addition of lime. The greatest increases came from the broadcast applications.

Fred Adams

Table 76 SMALL AMOUNTS OF LIME TO COTTON

Brewton Tier 11---1934-35

Continuous Cotton for 2 Years

Plot: No.	Fertilizer: Formula 1/: 600#/A	Dolomite Lime #/A	Yield - Pounds Seed Cotton per Acre: 1934	1935	Average, 1934-35
1	6-10-4	0	831	780	806
2	6-0-4	211	833	957	895
3	6-0-4	0	762	800	781
4	6-2-4	211	853	902	878
5	6-10-4	0	920	844	882
6	6-2-4	0	1040	894	967
7	6-2-4	2110 2/	1350	1186	1268
8	6-4-4	210	1247	1209	1228
9	6-10-4	0	1195	1059	1127
10	6-4-4	0	1018	970	994
11	6-4-4	2110 2/	1115	1022	1068
12	6-6-4	211	1071	1050	1061
13	6-10-4	0	1042	903	973
14	6-6-4	0	1017	973	995
15	6-8-4	211	944	944	944
16	6-8-4	0	1008	1054	1031
17	6-10-4	0	903	824	863

1/ Ammonium sulfate, superphosphate, and muriate of potash used at planting time; 3/4 of N applied as sodium nitrate after chopping.

2/ Dolomite applied broadcast on plots 7 and 11, applied in drill on all other plots.

SUMMARY: A good response to phosphorus was obtained. The response to lime application was somewhat erratic with respect to amount applied and method of application.

Fred Adams

Table 77 . . Effect of Lime, Basic Slag, And Superphosphate on a 2 Year Rotation of

COTTON-WINTER LEGUME-CORN & SUMMER LEGUMES

Brewton 1933-44

Tier 15 and 16

Plot No.	To Cotton[1] Super #/A	To Winter Legume Super #/A	To Winter Legume Basic Slag #/A	To Both Tiers in 1933 & 1939	Formula[2] (Total N.P.K. applied in 6 years)	12 year Average 1933-44 Cotton #/A	A.W.Peas[3] #/A G.W.	Crotalaria[4] G.W. #/A	Corn Bu/A
1	0	0	0		6-0-4	752	1808	8308	22.9
2	62.5	125	0		6-5-4	977	3629	7488	27.4
3	125.0	250	0		6-10-4	997	4836	6858	29.1
4	187.0	375	0		6-15-4	956	5601	5794	28.6
5	0	0	0		6-0-4	670	2185	6554	21.6
6	0	0	0	Dolomite-2000#	6-0-4	845	3225	7256	27.7
7	62.5	125	0	Dolomite-2000#	6-5-4	959	6080	7830	31.5
8	125.0	250	0	Dolomite-2000#	6-10-4	957	8368	7773	33.3
9	0	0	0		6-0-4	725	2646	6785	23.0
10	0	0	0	Basic Slag 2250	6-10-4	971	8234	6548	33.1
11	187.5	0	0	Basic Slag 2250	6-15-4	934	8595	6626	32.7
12	375.0	0	0	Basic Slag 2250	6-20-4	986	9025	6104	32.0
13	0	0	0		6-0-4	676	2338	6385	21.1
14	187.5	0	375		6-10-4	964	6807	5870	30.0
15	187.5	0	750		6-15-4	1051	7709	6216	31.6
16	187.5	0	1125		6-20-4	1065	8713	6621	32.3
17	0	0	0		6-0-4	730	2065	7622	21.8
Average of 1, 5, 9, 13, 17						711	2208	7131	22.1

1/ Cotton receives 36# N and 24# K_2O per acre plus phosphate shown. One-fourth of N as ammonium sulfate mixed with P and K and applied before planting and 3/4 as nitrate of soda. used as a side-dressing.

(Continued on back)

2/ Total fertilizer applied in 6 years is equivalent to 1800# per acre of formula shown. Ammonium sulfate 20.5% N, Sodium Nitrate 16% N, Muriate of Potash 50% K_2O, Superphosphate 16% P_2O_5, and Basic Slag 18% P_2O_5.

3/ Eleven year average for Winter legumes, 1934-44.

4/ Eight year average for crotalaria, 1937-44. See cropping system for explanation.

Cropping System: Cotton and Winter Legumes, Corn with Crotalaria sown broadcast at last cultivation (corn with soybeans in row 1933 and 1934; no legume in corn in 1935 and 1936; crotalaria sown broadcast in corn at last cultivation beginning in 1937.)

SUMMARY: Cotton: Phosphate increased the yield, but lime did not.

Corn: Corn yields were increased by phosphate and lime increased the yields about 4 to 5 bushels per acre.

Austrian Winter Peas: A good response in yield was evident from both phosphate and lime.

Crotalaria: Phosphate had no effect on yield, whereas lime gave a slight increase in yields.

Fred Adams

Table 78A Crimson Clover-Borax Seed Yield Test

Auburn 1950-53

The objectives of this test were to determine if applications of boron would increase the yield of crimson clover seed and the rates of borax necessary for maximum yields on Norfolk loamy sand.

Borax lbs./A.	Seed Yields in Lbs./Acre				
	1950	1951	1952	1953	Average
0	88	180	121	100	122.3
10	96	173	384	126	194.8
20	122	158	327	152	189.8
30	100	151	352	162	191.3

Fertilizer: 400 pounds of 0-16-8 w or w/o borax applied annually about September 1.

Conclusions: Boron applied at the rate of 10 pounds of borax increased the seed yield from 122.3 to 194.8 pounds per acre. No increase was obtained beyond the 10 pound rate.

Table 78B Crimson Clover-Borax Seed Yield Test

Piedmont Substation 1951-52

The objectives of this test were to determine if applications of boron would increase the yield of crimson clover seed and the rates of borax necessary for maximum yields on Lloyd clay loam.

Borax Lbs./A.	Seed Yields in Lbs./Acre		
	1951	1952	Average
0	223	78	150.5
10	193	78	135.5
20	198	82	140.0
30	267	80	173.5

Fertilizer: 400 pounds of 0-16-8 w or w/o borax applied annually about September 1.

Conclusions: Applications of boron did not increase crimson clover seed yield at this location

JI Wear

Table 78C Crimson Clover-Borax Seed Yield Test

Sand Mt. Substation 1952-54

The objectives of this test were to determine if applications of boron would increase the yield of crimson clover seed and the rates of borax necessary for maximum yields on Hartsells fine sandy loam.

Borax Lbs./A	Seed Yield in Lbs./Acre			
	1952	1953	1954	Average
0	108	340	121	189.6
10	617	422	169	402.7
20	649	369	202	406.7
30	667	409	202	426.0

Fertilizer: 400 pounds of 0-16-8 w or w/o borax applied annually about September 1.

Conclusions: Ten pounds of borax increased the yields of crimson clover seed from 189.6 to 402.7 pounds per acre. No significant increase was obtained above the 10 pound rate.

Table 78D Crimson Clover-Borax Seed Yield Test

Tuskegee Field 1950-53

The objectives of this test were to determine if applications of boron would increase the yield of crimson clover seed and the rates of borax necessary for maximum yields on Susquehanna clay.

Borax Lbs./A	Seed Yields Lbs./Acre				
	1950	1951	1952	1953	Average
0	177	160	93	306	184.0
10	154	161	125	250	172.5
20	183	173	176	249	195.3
30	151	150	218	343	215.5

Fertilizer: 400 pounds of 0-16-8 w or w/o borax applied about Sept. 1.

Conclusions: No increase in seed yields were obtained at this location.

Table 78E Crimson Clover-Borax Seed Yield Test

Brewton Field 1950-1953

The objectives of this test were to determine if applications of boron would increase the yield of crimson clover seed and the rates of borax necessary for maximum yields on Kalmia loamy sand.

Borax lbs./A.	Seed Yield in Lbs./Acre				
	1950	1951	1952	1953	Average
0	40	130	229	79	119.5
10	100	111	587	151	237.3
20	138	121	625	142	256.5
30	99	145	669	134	261.8

Fertilizer: 400 pounds of 0-16-8 w or w/o borax applied about September 1.

Conclusions: Ten pounds of borax increased the crimson clover seed yields from 119.5 to 237.3 pounds per acre. Twenty pounds of borax increased the yield to 256.5 pounds per acre.

Table 78F Crimson Clover-Borax Seed Yield Test

Lower Coastal Plain Substation 1951-53

The objectives of this test were to determind if applications of boron would increase the yield of crimson clover seed and the rates of borax necessary for maximum yields on Norfolk fine sandy loam.

Borax Lbs./A	Seed Yields in Lbs./Acre			
	1951	1952	1953	Average
0	89	297	24	136.6
10	401	419	175	331.7
20	341	358	200	299.7
30	332	381	184	299.0
M.E.	285	343	234	287.3

Fertilizer: 300 pounds of 0-16-8 w or w/o borax applied annually about September 1
M.E.-($ZnSO_4$, $MnSO_4$ - 10 lbs. per acre), $CuSO_4$ - 5 lbs. per acre and $NaMoO_4$ 1 pound per acre.

Conclusions: Ten pounds of borax increased the crimson clover seed yield from 136.6 to 331.7 pounds per acre. No increase was obtained above the 10 pound rate. No increase was obtained for minor elements other than boron.

J. I. Wear

Table 79:

Yields of Crimson Clover seed on Several Soil Types in Alabama as Influenced by Rates of Borax. Uniform Application of Lime and Fertilizer. Averages of Four Years and Three Replications[1/]

Location	Soil Type	Borax, lbs per acre annually			
		0	10	20	30
Auburn	Norfolk l.s.	122	195	190	191
Brewton	Kalmia l.f.s.	120	237	256	262
Crossville	Hartsoll f.s.l.	224	520	509	530
Camden	Norfolk f.s.l.	193	410	350	357
Camp Hill	Lloyd c.l.	150	196	140	174
Tuskegee	Boswell c.	184	172	195	216

1/ Reference: Wear, John I. Boron requirements for crimson clover seed production, its accumulation in soils, and residual effects on sensitive crops. Agronomy Journal 48: 132-134. 1956.

J. I. Wear

Table 80A Minor Elements to Corn
Monroeville 1948-51
Bu. per Acre

The objective of this test was to determine if applications of zinc or other minor elements would increase the yield of corn.

Minor Element Treatment[1]	1948	1949	1950	1951	Av. 1948-51
1 None	56.1	62.4	60.4	71.0	62.5
2 15# $ZnSO_4$	59.4	55.5	56.8	70.5	60.6
3 15# $ZnSO_4$ 15# $MnSO_4$ 5# $CuSO_4$ 5# Borax	56.4	57.3	57.6	70.8	60.5
4 15# $ZnSO_4$ 15# $MnSO_4$ 5# $CuSO_4$ 5# Borax; 50# $MgSO_4$	59.4	53.3	57.9	71.9	60.6

1/ All plots receive 600# 4-10-7 in drill at planting.

Table 80B Effect of Zinc on Yield of Corn - 3-year Average, Brewton Field, 1953-55

Treatment	Yield of Corn 1953 Bu./A	1954 Bu./A.	1955 Bu./A	Ave. 1953-55 Bu./A
No Zinc	41.2	23.6	52.5	39.1
5 lb. $ZnSO_4$ per acre	39.5	23.9	49.8	37.7
10 lb. $ZnSO_4$ per acre	39.4	22.6	50.4	37.5
15 lb. $ZnSO_4$ per acre	41.3	25.8	45.9	37.6
15 lb. $ZnSO_4$ applied 1951 only	39.0	24.8	47.7	37.2
No Zinc, 1 T. lime 1951	42.1	28.1	53.4	41.2
10 lb. $ZnSO_4$ per acre per year 1 T. lime, 1954	40.6	28.4	52.2	40.4

J I Wear

Table 81 Effects of Zinc on Yields of Corn

Brewton Field, Wiregrass S. S.
1953-55

The objectives of this test are as follows:

1. To determine the zinc requirements for corn on zinc deficient soil.
2. To determine the effects of lime on zinc requirements of corn.
3. To determine how long an application of zinc will last in the soil and if this application will correct zinc deficiency for a period of years.

The soil types:

1. Norfolk sandy loam - Wiregrass Substation
2. Kalmia sandy loam - Waterfield near Brewton Field.

Effect of Zinc on Yield of Corn - 4-Year Average, Wiregrass Substation 1951-54

Treatment	Yield of Corn				
	1951	1952	1953	1954	4 -yr. av.
	bu./A	bu/A.	bu./A	bu./A	bu./A
No Zinc	29.9	20.6	37.7	47.0	33.8
5 lb. $ZnSO_4$ per acre	31.5	22.6	41.2	46.6	35.4
10 lb. $ZnSO_4$ per acre	33.7	23.3	45.1	47.0	37.3
15 lb. $ZnSO_4$ per acre	35.4	22.0	40.2	46.8	36.1
15 lb. $ZnSO_4$ applied 1951 only	34.8	23.1	45.0	48.1	37.7
No Zinc, 1 T. lime 1951	24.7	14.2	33.5	37.5	27.4
10 lb. $ZnSO_4$ per acre per year 1 T. lime, 1954	34.5	20.3	40.5	49.5	36.1

J. I. Wear

Effect of Minor Elements on Yield of Cotton, Corn, Peanuts, Lupine, Hairy Vetch, Austrian Winter Peas and Crimson Clover.

To obtain more information on the requirements of a number of field crops for minor elements a field test was started on the agronomy farm at Auburn in 1941 to determine the effects of zinc, manganese, copper and boron on the yield of cotton, peanuts, and corn. The test later included Blue lupine, Hairy vetch, Austrian winter peas and crimson clover. The soil was classified as Chesterfield sandy loam. This soil had been previously limed and had a pH value of 6.0.

For the first five years a three-year rotation of cotton, peanuts, and corn was used with a medium rate of fertilizer. The cotton and corn received 600 pounds of 6-8-4 fertilizer per acre. Peanuts received 100 pounds of concentrated super and 150 pounds of gypsum per acre. The test was designed to omit one minor element at a time, to add all and to omit all of the four, and one treatment which received no fertilizer of elements was included. Rates per acre and sources were as follows: 10 pounds of zinc sulfate, 5 pounds of copper sulfate, 5 pounds of borax and 25 pounds of manganese sulfate.

In 1946, after the first 5 years, the fertilizer was increased to 1,000 pounds of 8-8-8 for the cotton and corn, and the peanuts received 75 pounds of muriate of potash in addition to phosphate and gypsum. The source of nitrogen was changed to ammonium nitrate. Dolomite was mixed with it to neutralize the acidity. No change was made in the minor elements used. Beginning in the fall of 1945 strips of different winter legumes were planted across the plots in the peanut tier; after the peanuts were dug no fertilizer was applied to the winter legumes. The winter legumes were plowed under in the spring and corn was planted on the tier. The results of the corn, cotton and peanuts for this 6 year period are presented in Table 2. The green weights of the winter legumes are presented in Table 3. Under these conditions of high fertility corn averaged 5.1 bushels more when zinc was added. No increase in yield of cotton or peanuts was measured as a result of this test.

(Tests on back of page)

Table 82 Effect of Minor Elements on Yield of Cotton, Corn, Peanuts, Lupine, Hairy Vetch, Austrian Winter Peas and Crimson Clover

Minor Element Treatment	Yield-5 Yr. Av. (1941-1945)			Yield-6 Yr. Av. (1946-1951)			Yield - Green Weight			
	Cotton	Corn	Spanish Peanuts	Cotton	Corn	Spanish Peanuts	Lupine 1/	Hairy Vetch 1/	Austrian Winter Peas 2/	Crimson Clover 3/
	lbs/A	Bu./A	lbs/A	lbs/A	Bu./A	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A
1. No minor elements applied	809	33.0	1169	1617	59.6	1312	19588	8320	11906	7130
2. Boron, manganese, copper (-Zn)	753	28.4	1156	1758	61.7	1308	19096	9832	12200	7591
3. Manganese, Copper & Zinc (-B)	874	36.3	1385	1738	67.2	1395	22009	10450	11363	9099
4. Copper, zinc, & boron (-Mn)	880	38.6	1274	1780	65.8	1370	22515	11327	12468	9565
5. Zinc, boron & manganese (-Cu)	980	35.0	1299	1592	66.6	1261	24087	10928	12810	8051
6. Zinc, boron, manganese & copper	1010	32.6	1353	1682	66.8	1315	24314	11080	11090	7444
7. No fert. - no minor elements	295	13.8	1123	342	32.3	1128	19763	3484	6388	2293

1/ 3 year average

2/ 2 year average

3/ 4 year average

J. I. Wear

Table 83 Fertilizer Placement Test for Hairy Vetch

Alexandria - 1932-34

Fertilizer / A	How applied	Green Wt. in Lbs. Per Acre 1932	1933	1934	Ave. 32-34
None		6550	6345	8700	7198
200# Superphosphate	Broadcast	8100	10540	14600	11080
400# Superphosphate	Broadcast	11040	12585	19150	14258
800# Superphosphate	Broadcast	11530	14040	30850	18807
200# Superphosphate	In Furrow	9090	12970	19470	13843
400# Superphosphate	In Furrow	10275	13360	17750	13795
None		6325	7500	6500	6775

Method of preparation - None

Seed per acre - 30#

Variety - Hairy Vetch

Area Harvested - 1/1000 acre

At the low rate of phosphorus, in the furrow method of application gave better results than the broadcast method. At the higher rate there was little difference in the two methods.

J.T. Hood

Table 83-2 Response of Sericea to Rates of Concentrated Superphosphate Sources of Phosphorus, Lime, Sulfate, Potash and Minor Elements at Sand Mt. Monroeville, Tuskegee, Piedmont, Alexandria, Brewton and Prattville -1948-52

No.	Treatments 1/ Sources of Phosphorus	Lime	P_2O_5 applied Annually 1947-50	P_2O_5 applied Annually 1953-55	SO_3	K_2O	Minor Elements	Hay per acre: Sand Mt Field 1950-55	Monroeville F: 1948-55	Tuskegee Field 1948-55	Piedmont Substation 1948-1953	Alexandria Field 1948-53	Brewton Field 1948-53	Prattville Field 1948-52
		lb.	lb.	lb.	lb.	lb.		lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	CSP	2000	50	0	60	120	0	5758	6450	6150	5444	4832	7172	6559
2	CSP	2000	100	100	60	120	0	6060	6579	7264	5524	5156	6619	7115
3	CSP	2000	150	0	60	120	0	5722	6380	7285	5762	5264	7225	6369
4	CSP	2000	100	100	0	120	0	5952	6433	7110	5052	5065	7234	6477
5	CSP	2000	100	100	30	120	0	6471	6488	7574	5434	5158	6886	7052
6	CSP	2000	100	100	120	120	0	6267	6495	7710	5539	5151	7174	6443
7	CSP	2000	100	100	60	60	0	6025	6273	7058	5377	4902	6548	6466
8	CSP	2000	100	100	60	240	0	6363	6489	7544	5060	5144	6230	6714
9	CSP	0	100	100	60	120	0	6197	6030	6430	5246	5319	6826	6626
10	CSP	2000	100	100	60	120	B	6169	6736	7280	5652	5304	5994	6761
11	CSP	2000	100	100	60	120	BME	5817	7193	7577	5565	5408	7173	7252
12	Superphosphate	2000	100	0	0	120	0	5595	6624	7395	5335	5080	6329	7671
13	FT Ca. Phos. 10 mesh	2000	100	0	60	120	0	5584	6641	7380	5542	5257	6180	6952
14	FT Ca. Phos. 40 mesh	2000	100	0	60	120	0	5993	6587	7530	5224	5203	6712	7171
15	Colloidal Phos.	2000	200 3/	0	0	120	0	5924	6564	7572	5133	4997	6231	7205
16	Colloidal Phos.	2000	200	0	0	120	0	5895	6702	7394	5124	5206	6743	6868
17	Basic slag	2000	100	0	60	120	0	6300	6806	7424	5224	5129	7077	7208
18	Basic slag	0	100	0	60	120	0	6270	6383	7427	5876	5118	6627	7140

1/ Lime and fertilizer applied before planting - thereafter all fertilizers applied before growth starts in spring. SO_3, K_2O, and lime supplied as gypsum, muriate of potash, and dolomite, respectively.

2/ No phosphate applied in 1951 and 1952.

3/ Superphosphate (100 pounds P_2O_5 per acre) used at planting, colloidal phosphate used thereafter.

B = 15 pounds borax per acre

ME = 30 pounds $MnSO_4$, 30 pounds $ZnSO_4$, and 10 pounds $CuSO_4$ per acre.

Conclusions: Rather large yields of hay were obtained at all locations, especially considering the fact that some of the summers were rather dry. The experiment is being continued at Sand Mountain Substation and at the Tuskegee and Monroeville Fields. Response to treatments have been obtained only at Sand Mountain Substation and Tuskegee Field. A response to phosphorus was obtained at Sand Mountain for the first time in 1955. Results from the Tuskegee Field showed a significant response to phosphorus and lime for 1954 and 1955.

L. E. Ensminger

Table 84 The Yields of Crops in Cropping Systems Experiment at Tennessee Valley Substation - 1930-53 by 6 year Periods

Cropping System	Crop	Tier	Plot	Yield by 6 year periods 1930-35 (1)	1936-41 (2)	1942-47 (3)	1948-53 (4)	1930-53
Continuous Cotton No N	Cotton	17	2	919	756	799	582	764
Continuous Cotton N	Cotton	17	3	1154	1214	1183	1146	1174
Continuous Cotton W.L.	Cotton	17	4	1140	1196	1238	1223	1199
	W. L.		4	8628	5871	7678	10300	8119
Continuous Corn No.N	Corn	21	2	23.2	14.0	9.0	9.0	13.8
Continuous Corn N	Corn	21	3	29.9	36.1	23.0	35.6	31.2
Continuous Corn W. L.	Corn	21	4	31.0	34.0	27.1	36.6	32.2
	W. L.		4	7511	4211	6774	11171	7417
Continuous Corn, N.,W.L. (begin 1950)	Corn	19	4				33.8[13]	
	W. L.		4				13268[14]	
Continuous oats	Oats	19	2	17.4	7.8[7]			15.0[17]
Continuous Oats, N	Oats	19	3	36.1	32.7[7]			35.2[17]
Continuous oats, S. L.	Oats	19	4	22.3	18.7[7]			21.4[17]
	S. L.	19	4	3722	8059[8]			4342[18]
Continuous oats, N. S.L. hay	Oats	19	4		43.7[1]	35.6	50.6[12]	40.8[19]
	S.L.Hay		4		3180[1]	2212		2599[20]
2 Yr. Rot. Cotton	Cotton	17	6	975	843	804	648	818
Corn	Corn		7	24.3	15.5	7.4	5577	13.2
2 Yr. Rot. Cotton N	Cotton	19	6	1240	1481	1421	1270	1353
Corn N	Corn		7	34.0	42.1	31.0	40.6	36.9
2 Yr. Rot. Cotton, W.L.	Cotton	19	9	1233	1389	1264	1061	1237
Corn	W. L.		10	12756	8131	11135	13740	11440
	Corn			38.2	44.5	33.8	45.9	40.6
2 Yr. Rot. Cotton W.L.	Cotton	21	6	1133	1412	1282		1276[21]
Corn S.L.	W. L.		7	10948	8385	8640		9324[21]
	Corn			19.9	29.5	17.7		22.4[21]
	S.L.			6763	5858	6660		6427[21]
2 Yr. Rot. Cotton	Cotton	21	9	1247	1237	1166		1217[21]
Corn S. L.	Corn		10	20.5	17.2	7.6		15.1[21]
	S. L.			6203	4729	5148		5360[21]
2 Yr. Rot. Cotton, N W.L.	Cotton	17	9	1431	1439	1374	1222	1366
Corn	W.L.		10	13945	9983	11598	15282	12702
	Corn			36.4	45.8	31.4	48.4	40.5
2 Yr. Rot. Cotton	Cotton	19	2		1166[1]	1308	1293	1267[22]
Corn,N, W. L.	Corn		3		37.2[1]	24.4	38.9	33.0[22]
	W. L.				3322[2]	10028	11271	9184[23]
2 Yr. Rot. Corn,Oats,N	Corn	21	6				44.2	
Grain Sorghum N, W.L.	Oats		7				78 4	
	G. Sorghum						24.2	
	W. L.						11743	

Cropping System	Crop	Tier	Plot	Yield by 6 year periods 30-35	36-41	42-47	48-53	30-53
				1	2	3	4	
2 yr.rot.cotton,R.C.	Cotton	21	9				1120	
G. S. Res. Cl.								
Res. Cl.								
Seed			10				312[10]	
G. S.							25.0	
Res. Cl.							248[9]	
3 Yr. Rot. Cotton	Cotton	All	1,5,8,11 & 17	1152	1144	1099	963[11]	1090
Oats	Oats			25.9	14.5	14.0	12.3[11]	16.7
Corn	Corn			28.4	19.4	11.3	15.0[11]	18.5
3 Yr. Rot. Cotton N	Cotton	All	12	1370	1595	1522	1347	1458
Oats N	Oats			36.5	49.8	62.5	76.8	56.4
Corn N	Corn			39.4	45.3	31.8	46.7	40.8
3 Yr. Rot. Cotton	Cotton	All	13	1404	1642	1459	1415	1480
Oats, L. H.,W. L.								
Oats				30.4	45.2	49.1	82.6	51.8
Corn & S. L., W. L.								
L. H.				2493	3320	2996	[16]	2936[21]
W. L.				12493	10999	12451	12296	12060
Corn				21.9	32.7	17.4	50.7	30.7
(1950 - oats begin getting N)								
S. L.				7826	9488	7886	[16]	8400[21]
W. L.				5988	2378	3090[3]	8013	5029[24]
3 Yr. Rot. Cotton	Cotton	All	14	1365	1518	1418		1434[21]
Oats, L. H.,W. L.								
Oats				30.4	34.9	45.1		36.8[21]
Corn & Peanuts								
L. H.				2371	3080	2781		2744[21]
(Peanuts began in 1932)								
W. L.				13067	10482	11495		11681[21]
Corn				25.2	36.3	24.2		28.6[21]
Peanuts				816[4]	380	798		646[22]
3 Yr. Rot. Cotton, W. L.								
Cotton		All	15	1530	1650	1528	1478	1546
Corn & S. L.								
W. L.				6874	4610	7024	10665	7293
Oats L. H.,W. L.								
Corn				24.4	32.0	16.8	48.6	30.4
S. L.				8591	4879	7706	[16]	7059[21]
Begin 1950 oats get N								
Oats				33.7	45.1	47.9	57.9	46.2
L. H.				2402	3203	2821	[16]	2809[21]
W. L.				12976	8576	7024	12723	10325
3 Yr. Rot. Cotton, W. L.								
Cotton		All	16	1376	1448[5]			1400[25]
Corn	Wood			11350	10491[5]			11064[25]
Oats, L. H.								
Corn				39.7	50.8[5]			43.4[25]
Oats				29.3	28.2[5]			28.9[25]
L. H.				2254	3395[5]			2634[25]
3 Yr. Rot. Cotton N	Cotton	All	11				1342	
Oats N	Oats						84.5	
L. H.,W. L.								
L. H							[16]	

					1	2	3	4
3 Yr. Rot.	Cotton N	Cotton	All	14				1332
	Oats N	Oats						75.5
	G. S. N	G. S.						25.4
	W. L.	W. L.						12206
	Corn	Corn						52.2
3 Yr. Rot.	Cotton N	Cotton	All	16	1711 6/	1536	1295	1475 23/
	Oats N, L. H., W. L.							
		Oats			59.2 6/	66.6	83.7	72.0 23/
	Corn	L. H.			2855 6/	2924	16/	29 25/
		W. L.			8839 6/	12959	15182	13024 23/
		Corn			52.0 6/	34.4	51.5	44.8 23/
3 Yr. Rot.	Cotton N	Cotton	All	5				1303
	Oats N.,L. H.,W. L.							
		Oats						65.4
	Corn N	L. H.						16/
		W. L.						18949 15/
		Corn						37.4

1/ 4 yr. ave. 1938-41
2/ 3 yr ave. 1939-41
3/ 4 year ave. 1944-47 - No vetch in 1942 & 43
4/ 4 yr. ave. 1932-35
5/ 3 yr. ave. 1936-38
6/ 3 yr. ave. 1939-41
7/ 2 yr ave. 1936-37
8/ 1936 only no S. L. in 1937.
9/ 3 yr. ave. 1949-51 - none planted other years
10/ 2 yr. ave. 1949-50 - none planted other years
11/ Average of plots 1,8 & 17
12/ 2 yr. ave. 1948-49
13/ 4 yr ave. 1950-53
14/ 3 yr. ave. 19 1-53.
15/ 5 yr ave. 1949-53 - no record in 1948.
16/ No legume after oats during this period. Also no S. L. Grown.
17/ 8 yr. ave.
18/ 7 yr. ave.
19/ 12 yr. ave.
20/ 10 yr. ave.
21/ 18 yr. ave.
22/ 16 yr. ave.
23/ 15 yr. ave.
24/ 22 yr. ave.
25/ 9 yr. ave.

Fertilizers : All plots had 600# 0-10-4 annually from 1930 thru 39 and 0-8-4 1940-43 and 0-8-8 from 1944 to date. When N was used it was 36 # from 1930-43 and 48# 1944 to date.

CONCLUSIONS:

Oats

Oats should not be grown continuously on the same land (compare yields of T19P3 with all tiers P12) Plowing under a summer legume to furnish nitrogen for oats does not result in high yields of oats P19 T4 Oats apparently must have commercial N in the spring for maximum yields.

Cotton

Cotton can be grown continuously if N is supplied in the fertilizer or as legumes (T17 Plots 2,3 & 4). A rotation appears to be of some benefit to cotton. (Compare T17 P3 with T 19 P 6 & 7 or all tiers P 12). Therefore maximum yields of cotton were obtained in rotations using legumes. The best 2 year rotation was cotton N followed by winter legume turned under for corn (Tier 17, P 9 & 10). The most practical 3 year rotation was cotton N oats N-LH. W. L. corn. (P 16) or cotton oats N - L. H. - W. L. - Corn - W. L. (P13). The crops could be arranged in a different order cotton, W. L., corn, oats N., L. H. - W. L. (P 15) if it was desired. The last 2 rotations involve the maximum use of legumes therefore are difficult to operate on a large scale.

Corn

Corn can be grown continuously if N is supplied as a fertilizer or in legumes (T 21 Plots 2, 3, and 4). A rotation appears to be of benefit to corn (compare T 21 P3 with T 19 P 6 & 7 and all Tiers Plot 12.) The rotations suitable for production of corn are the same as the ones suggested for cotton.

D. G. Sturkie

Table 85 The Yields of Crops in Cropping Systems Experiment at Sand Mt. Substation 1930-53 by 6-Year Periods

Cropping System	Crop	Tier	Plot	Average by 6 Year periods 1	2	3	4	1930-53
Continuous Cotton	Cotton	20	2	500	502	643	546	548
Continuous Cotton N	Cotton	20	3	1394	1528	1588	1348	1464
Continuous Cotton W.L	Cotton	20	4	1730	1699	1714	1457	1650
	W. L.		4	9471	9390	7757	10382	9250
Continuous Corn	Corn	22	2	12.0	8.6	10.6	3.6	8.7
Continuous Corn N	Corn	22	3	41.3	38.9	39.6	49.9	42.4
Continuous Corn W. L.	Corn	22	4	37.4	31.8	39.7	46.8	38.9
	W. L.		4	4898	4407	5755	10319	6345
Continuous Corn 16#N W. L.	Corn	21	4	---	---	---	53.1 12/	---
	W. L.		4	---	---	---	14936 11/	---
Continuous oats	Oats	21	2	5.3	0 1/	---	---	4.0 17/
Continuous oats N	Oats	21	3	22.7	8.3 1/	---	---	19.1 17/
Continuous Oats S. L.	oats	21	4	17.4	14.0 1/	---	---	16.6 17/
	S. L.		4	12644 2/	9736 1/	---	---	11813 18/
Continuous Oats N. S. L. Hay	Oats	21	4	---	60.7 3/	41.6	52.2 10/	48.7 19/
	S.L.Hay		4	---	3317 4/	3059	---	3162 20/
2 yr rot. Cotton, Corn	Cotton	20	6	593	541	544	444	530
	Corn		7	10.9	4.9	7.5	1.4	6.2
2 yr. rot. Cotton N	Cotton	21	6	1395	1533	1641	1396	1491
Corn N	Corn		7	39.2	37.1	40.8	49.3	41.6
2 yr. rot. Cotton W. L.	Cotton	21	9	859	962	1282	1075	1044
Corn	W. L.		&	7142	5828	7938	14889	8949
	Corn		10	41.9	30.2	50.2	74.6	49.2
2 yr. rot. Cotton W. L.	Cotton	22	6	1038	1464	1590	---	1364 21/
Corn S. L.	W. L.		&	6419	6677	7728	---	6941 21/
	Corn		7	31.0	27.0	43.9	---	34.0 21/
	S. L.			6451	7412	4598	---	6154 21/
2 yr. rot. Cotton	Cotton	22	9	1007	1324	1486	---	1272 21/
Corn S. L.	Corn		&	12.2	10.1	19.1	---	13.8 21/
	S. L.		10	6480	7676	5104	---	6420 21/
2 yr. rot. Cotton N W. L.	Cotton	20	9	1611	1856	1847	1559	1718
Corn	W. L.		&	11723	10939	8028	16730	11855
	Corn		10	56.7	43.3	52.8	78.1	57.7
2 yr. rot. Cotton	Cotton	21	2	---	1745 4/	1785	1286	1588 22/
Corn 48# N W. L.	Corn		&	---	46.5 4/	47.8	60.5	52.2 22/
	W. L.		3	---	7651 5/	8238	11872	9712 23/
2 yr. rot. Corn	Corn	22	6	---	---	---	66.2	---
Oats N	Oats		&	---	---	---	38.6 14/	---
Grain Sorghum N	G. Sorg.		7	---	---	---	2017	---
W. L.	W. L.			---	---	---	13459	---
2 yr. rot. Cotton, Res. Cl.	Cotton	22	9	---	---	---	1221	---
Grain S. Res. Cl.	Cl. Seed		&	---	---	---	16/	---
	G. Sorg		10	---	---	---	29.2	---
	Cl			---	---	---	22293	---
3 yr. rot. Cotton	Cotton	All	12/	723	897	1020	857	874
Oats	Oats		5,8	8.9	9.5	66.2	6.3 14/	7.8 24/
Corn	Corn		11 & 17	14.5	10.2	16.8	14.2	13.9
3 yr. rot. Cotton N	Cotton	All	12	1363	1707	1824	1584	1620
Oats N	Oats			48.3	48.2	44.8	34.5 14/	44.4 24/
Corn N	Corn			44.5	43.9	52.0	67.3	51.9
3 yr. rot Cotton	Cotton	All	13	1510	1267	1212	1274	1316
Oats, L. H., W. L.	Oats			13.5	16.1	26.4	34.9 14/	22.2 24/
Corn & S. L., W. L.	L. H.			2409	2819	3082	15/	2770 21/
	W. L.			5357	3006	7902	9742	6502
	Corn			36.5	28.7	47.8	70.6	45.9
(Oats get N beginning 1952)	S. L.			5087	3846	4504	15/	4479 21/
	W. L			5640	3522	4211	6635	5002
3 yr. rot. Cotton	Cotton	All	14	958	1103	1345	---	1135 21/
Oats L. H., W. L.	Oats			9.7	12.5	15.0	---	12.4 21/
Corn & Peanuts	L. H.			2527	3354	3291	---	3057 21/
	W. L.			5176	4114	9159	---	6150 21/
	Corn			35.7	27.4	41.4	---	34.8 21/
	Peanuts			980 6/	862	596	---	792 22/

Cropping System	Crop	Tier	Plot	Average by 6 Year periods 1	2	3	4	1930-53
3 yr. rot. Cotton, W. L.	Cotton	All	15	1704	1435	1392	1264	1449
Corn & S. L.	W. L.			7887	5255	6377	8598	7029
Oats, L. H., W.L.	Corn			41.9	32.1	38.7	63.1	44.0
	S. L.			5179	4145	5340	15/	4888[21]/
	Oats			21.3	29.7	31.2	29.9[14]/	27.9[24]/
(Oats get N beginning 1950)	L. H.			2633	3209	2997	15/	2946[21]/
	W. L.			7374	3855	6682	9329	6808
8 yr. Rot. Cotton, W. L.	Cotton	All	16	948	1047[1]/	---	---	981[25]/
Corn	W. L.			7311	3816[7]/	---	---	6146[25]/
Oats, L. H.	Corn			45.2	27.3[7]/	---	---	39.2[25]/
	Oats			11.6	7.5[7]/	---	---	10.2[25]/
	L. H.			2659	4035[7]/	---	---	3118[25]/
3 yr. rot. Cotton N	Cotton	All	11	---	---	---	1376	---
Oats - N, L. H. W. L.	Oats			---	---	---	30.3[14]/	---
Corn 32# N	L. H.			---	---	---	15/	---
	W. L.			---	---	---	1880[13]/	---
	Corn			---	---	---	76.9	---
3 yr. rot. Cotton N	Cotton	All	14	---	---	---	1452	---
Oats N, G. Sorg. N	Oats			---	---	---	34.1[14]/	---
W. L.	G. S.			---	---	---	22.9	---
Corn	W. L.			---	---	---	1333[8]	---
	Corn			---	---	---	75.6	---
3 yr rot. Cotton N	Cotton	All	16	---	1761[8]/	1672	1490	1617[26]/
Oats N, L. H., W. L.	Oats			---	55.8[8]/	51.2	44.9	49.6[26]/
Corn	L. H.			---	2861[8]/	3057	15/	2992[25]/
	W. L.			---	4032[8]/	9700	14375	10436[26]/
	Corn			---	33.2[8]/	59.2	78.9	61.9[26]/
3 yr. rot. Cotton 48# N	Cotton	All	5	---	---	---	1381	---
Oats N, L. H. W. L.	Oats			---	---	---	32.1[14]/	---
Corn 16# N	L. H.			---	---	---	15/	---
	W. L.			000	---	---	2000[13]/	---
	Corn			---	---	---	74.3	-0-

1/ 2 year ave. 1936-37
2/ 5 yr. ave.
3/ 3 yr. ave. 1939-41 No oats in 1938
4/ 4 year ave. 1938-41
5/ 2 yr. ave. 1940-41
6/ 4 year ave 1932-35. Peanuts and corn did not begin until 1932.
7/ 3 year ave. 1936-38. Exp. changed after 1938.
8/ 3 year ave 1939-41. Exp. changed after 1938.
9/ Average for 4th period is average of 1, 8 & 17. Plots 5 and 11 were changed.
10/ 2 year ave 1948-49 - 48# N applied. No record of legume hay.
11/ 2 year ave. 1952 and 53. No legume in 1950 and 51.
12/ 4 year ave. 1950-53 - rotation started in 1950.
13/ 5 year ave - no vetch in 1948.
14/ 5 year ave. - records lost in 1950
15/ No legume hay grown after oats during this period. Also no summer legumes gr grown.
16/ No seed yields taken
17/ 8 yr. ave.
18/ 7 yr. ave.
19/ 11 yr. ave.
20/ 10 yr. ave.
21/ 18 yr ave.
22/ 16 yr. ave.
23/ 14 yr. ave.
24/ 23 yr. ave.
25/ 9 yr. ave.
26/ 15 yr. ave.

CONCLUSIONS:

Oats

Oats should not be grown continuously on the same land (compare yield of T 21 P3 with those on all Tiers P 12) Plowing under a summer legume to furnish nitrogen for oats does not result in high yields of oats (T 21 P 4). Oats apparently must have commercial N. in the spring for maximum yields.

Cotton

Cotton can be grown continuously if nitrogen is supplied in the fertilizer or in winter legumes. (T 21 P 2, 3, & 4). A rotation appears to be of some benefit to cotton (compare T 21P 3 with T 21 P 6 & 7 or all tiers. P 12). Maximum yields of cotton were obtained in rotations using winter legumes. The best 2 year rotation was cotton N followed by W. L. turned for corn (T 20 P 9 and 10). The most practical 3 year rotation was cotton N oats - N. - L. H. - W. L. - Corn (P16)

Corn

Corn can be grown continuously if N is supplied as fertilizer or as winter legumes. (T22 Plots 2,3 & 4) a rotation did not appear to be beneficial to corn in these tests.

Fertilizers

All plots had 600# 0-10-4 annually 1930-39 and 0-8-4 from 1940-43 and 0-8-8 from 1944 to date, when N is used it was 36# from 1930-43 and 48# from 1944 to date

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Cropping system	Crop	T	P	1930-35	36-41	42-47	48-53	1930-53
Continuous Cotton No. N	Cotton	3	2	667	614	811	---	531[13]
Continuous Cotton N	Cotton	3	3	1232	1415	922	1059	1157
Continuous Cotton, W. L.	Cotton	3	4	1102	1478	1448	1446	1368
	W. L.	3	4	4728	11162	16952	5042	9471
Continuous Oats No N	Oats	4	2	12.2	9.1[9]	---	---	11.4[14]
Continuous oats N.	Oats	4	3	24.9	28.4[10]	---	---	25.4[15]
Continuous oats Legumes turned	Oats	4	4	16.7	36.1[10]	---	---	195[15]
	Peanuts		4	1216	1008[10]	---	---	1186[15]
Continuous oats NPK and Peanuts	Oats	4	4	---	45.3[11]	2916	---	34.8
	Peanuts		4	---	872[11]	1021[3]	---	965[14]
Continuous corn No N	Corn	5	2	15.5	10.6	23.9	---	16.7[12]
Continuous corn N	Corn	5	3	29.9	30.1	37.8	27.5	31.[illegible]
Continuous corn W. L.	Corn	5	4	29.1	32.8	43.7	28.7	33.6
	W. L.		4	5824	10273	11627	9765	9372
Continuous Corn N W. L.	Corn	5	2	---	---	---	33.8	---
	W. L.		2	---	---	---	10200	---
Continuous Peanuts, W. L.	Peanuts	4	4	---	---	---	1918	---
	W. L.	4	4	---	---	---	5630	---
Continuous cotton N., W. L.	Cotton	3	2	---	---	---	1327	---
	W. L.	3	2	---	---	---	5460	---
2 yr. rot., cotton and corn	Cotton	3	6	816	682	630	---	709[13]
	Corn		7	13.7	10.2	11.0	---	11.6[13]
2 yr. rot., Cotton N	Cotton	4	6	1341	1503	1254	1361	1365
Corn N	Corn		7	23.9	31.6	31.3	29.3	29.0
2 yr. rot., Cotton W. L.	Cotton	4	9	9942	1031	984	---	986[13]
Corn	W. L.		10	3534	9192	17502[3]	---	9639[17]
	Corn			23.2	28.8	40.7	---	30.9[13]
2 yr. rot., Cotton N., W. L.	Cotton	3	9	1362	1620	1541	1507	1508
Corn	W. L.		10	5759	11061	17177	7892	10472
	Corn			26.2	33.3	42.2	27.0	32.2
2 yr. rot., Cotton	Cotton	5	9	1180	1390	1156	---	1242[13]
Corn and S.L.	Corn		10	18.7	20.7	26.9	---	22.1[13]
	S. L.			3235	5347	10636[1]	---	5560[16]
2 yr. rot., Cotton W. L.	Cotton	5	6	1196	1471	1253	---	1307[13]
Corn S. L.	W. L.		&	4839	8193	14956	---	9329[13]
	Corn		7	23.3	34.1	45.9	---	34.4[13]
	S. L			1873	3194	3982	---	3016[13]
2 yr. rot., Cotton	Cotton	4	2	---	1533[7]	1579	1578	1567[18]
Corn N., W. L.	Corn		&	---	34.8[6]	41.8	35.3	37.6[18]
	W. L.		3		13888[8]	20403[3]	12495	15618[19]
2 yr. rot., Cotton W. L.	Cotton	4	9	---	---	---	1457	---
Corn W. L.	W. L.		&	---	---	---	5670	---
C	Corn		10	---	---	---	29.3	---
	W. L.						8044	---

Continued on back

Cropping System	Crop	T	P	Yield of crops per acre, Average by 6 yr. periods 1930-35	36-41	42-47	48-53	1930-53
2 yr. rot., Cotton W. L.	Cotton	5	6	---	---	---	1283	---
Corn N., W. L.	W. L.		7	---	---	---	6378	---
	Corn			---	---	---	33.7	---
	W. L.						8392	---
2 yr. rot., Cotton N	Cotton	5	9	---	---	---	1136	---
Corn N. W. L.	Corn		&	---	---	---	28.9	---
	W. L.		10	---	---	---	7841	---
2 yr. rot., Cotton N., W. L.	Cotton	3	6	---	---	---	1487	---
Corn N., W. L.	W. L.		&	---	---	---	6305	---
	Corn		7	---	---	---	31.2	---
	W. L.			---	---	---	8879	---
3 yr. rot., Cotton	Cotton	3	1,5	958	908	873	---	913[13]
Oats	Oats	4&	8,11	13.2	11.4	11.0	---	11.9[13]
Corn	Corn	5	&17	19.7	15.6	20.1	---	18.5[13]
3 yr. rot., Cotton N.	Cotton	3	12	1489	1690	1479	---	1553[13]
Oats N	Oats	4		30.6	40.2	30.9	---	33.9[13]
Corn N	Corn	5		34.3	31.8	36.8	---	34.3[13]
3 yr. rot., Cotton., W. L.	Cotton	3	16	1070	1539[2]	---	---	1187[14]
Corn	W. L.	4		4176	8778[2]	---	---	5326[14]
Oats, Legume Hay	Corn	5		25.8	36.2[2]	---	---	28.4[14]
(1930-37)	Oats			16.1	16.8[2]	---	---	16.3[14]
	L. H.			2684	6905[2]	---	---	3739[14]
3 yr. rot., Cotton	Cotton	3		---	1429[5]	1550[21]	---	1469[20]
Oats 36#N	Oats	4	16	---	40.6[5]	36.6[21]	---	39.3[20]
Peanuts (dug)	Peanuts	5		---	1186[5]	1817[22]	---	1312[24]
Corn, W. L.	Corn			---	20.1[5]	26.8[21]	---	22.7[20]
(1938-43)	W. L.			---	7672[5]	10661[21]	---	8668[20]
3 yr. rot., Cotton 48#N	Cotton	3	16	---	---	1233[23]	---	---
Oats 48#N	Oats	4		---	---	29.2[23]	---	---
Peanuts (dug) W. L.	Peanuts	5		---	---	924[23]	---	---
Corn	W. L.			---	---	36.0[23]	---	---
3 yr. rot., Cotton	Cotton		14	1214	1577	1310	---	1367[13]
Oats - L.H., W.L.	Oats	3		17.3	21.6	18.1	---	19.0[13]
	Peanuts	4		1759	965	7554/	---	1132[19]
Corn and Peanuts	L. H.	5		2336	3211	2944	---	2830[13]
	W. L.			5834	8030	16524	---	10129[13]
	Corn			20.3	20.8	32.2	---	24.4[13]
3 yr. rot., Cotton	Cotton	3	13	1422	1816	1652	---	1630[13]
Oats, L. H., W.L.	Oats	4		18.4	26.9	24.3	---	23.2[13]
Corn, S.L., W.L.	L. H.	5		2517	3692	3064	---	3091[13]
	W.L.			5709	9921	16451	---	10694[13]
	Corn			25.5	36.1	46.9	---	36.2[13]
	S. L.			1971	2516	6126[4]/	---	3214[18]
	W. L.			5813	7550	16139	---	9834[13]
3 yr. rot., Cotton W.L.	Cotton	3	15	1335	1706	1470	---	1504[13]
Corn S.L.	W.L.	4		4263	7543	15813	---	9006[13]

Cropping System	Crop	T	P	Yield of crops per acre: Average by 6 yr. periods 1930-35	36-41	42-47	48-53	1930-53
	L. H.			2698	4023	3515[3]	---	3406[17]
	W. L.			5082	8197	14489	---	9256[13]
3 yr. rot., Cotton	Cotton	3	5	---	---	---	1297	---
Peanuts	Peanuts	4		---	---	---	1875	---
Corn	Corn	5		---	---	---	24.4	---
3 yr. rot., Cotton N	Cotton	3	12	---	---	---	1605	---
Peanuts N	Peanuts	4		---	---	---	1968	---
Corn N	Corn	5		---	---	---	25.0	---
3 yr. rot., Cotton	Cotton	3	1	---	---	---	1555	---
Peanuts W. L.	Peanuts	4	8	---	---	---	1867	---
Corn W.L.	W.L.	5	17	---	---	---	7496	---
	Corn			---	---	---	26.2	---
	W.L.			---	---	---	8044	---
3 yr. rot., Cotton N	Cotton	3	15			---	1734	---
Peanuts W.L.	Peanuts	4		---	---	---	1990	---
Corn	W.L.	5		---	---	---	6472	---
	Corn			---	---	---	24.0	---
3 yr. rot. Cotton	Cotton	3	14	---	---	---	1603	---
Peanuts	Peanuts	4		---	---	---	2064	---
Corn N.,W. L.	Corn	5		---	---	---	26.0	---
	W.L.			---	---	---	8726	---
3 yr. rot., Cotton W.L.	Cotton	3		---	---	---	1604	---
Peanuts W.L.	W.L.	4	13	---	---	---	5318	---
Corn W.L.	Peanuts	&		---	---	---	1951	---
	W. L.	5		---	---	---	5841	---
	Corn			---	---	---	26.2	---
	W. L.			---	---	---	7641	---
3 yr. rot., Cotton N. W.L.	Cotton	3	11	---	---	---	1564	---
Peanuts N W.L.	W.L.	4		---	---	---	7572	---
Corn N. W.L.	Peanuts	&		---	---	---	1809	---
	W.L.	5		---	---	---	6149	---
	Corn			---	---	---	26.8	---
	W.L.			---	---	---	9950	---
3 yr. rot., Cotton	Cotton	3	16	---	---	---	1708	---
Peanuts W. L.	Peanuts	4						
	Fert.B.C.	5		---	---	---	1848[25]	---
Corn W.L.	Peanuts							
Fertilizer B.C on B part of Peanut area	Fert. Drill			---	---	---	1943[25]	
Fertilizer in Drill A part of Peanut area	W. L.			---	---	---	6058	---
	Corn			---	---	---	26.9	---
	W. L.			---	---	---	7659	---

1/ 3 year average - No report in 1944, 46 and 47.
2/ Ave. of 1936-37
3/ 5 year ave. No record for 1943
4/ 4 year ave.
5/ 4 year ave. 1938-41
6/ 4 year ave. began in 1938.
7/ 4 year ave. 1937,39,40&41 Oats on plot 1930-36
8/ 3 year ave. 1939-41.
9/ Average 1936&37

Footnotes continued

10/ 1 year average 1936 only. In 1938 plot 4 had Austrian peas and cotton grown which yield 15268 and 2077#/A respectively. In 1937 Corn 36#N yielded 51.7 bu corn per acre.

11/ 3 year ave. 1939-41
12/ 4 year ave. No record in 1946 & 47.
13/ 18 year ave.
14/ 8 yr. ave.
15/ 7 yr. ave.
16/ 15 yr. ave.
17/ 17 yr. ave.
18/ 16 yr. ave.
19/ 14 yr ave.
20/ 6 yr ave.
21/ 2 yr ave. 1942-43
22/ 1 yr only 1942. No record for 1943
23/ 4 yr. ave. 1944-47
24/ 5 yr. ave.
25/ 4 yr ave for peanuts, oats and soybeans for seed on plot in 48 & 49. No yield refer to rotation change for plot 16, 1950.

CONCLUSIONS:

Oats

Oats should not be grown continuously on the same land. (compare yield of T4 P4 with All tiers, Plot 12. Plowing under a summer legume to furnish nitrogen for oats does not result in a high yield of oats (T4 P4). Oats apparently must have commercial nitrogen in the spring for maximum yields.

Cotton

Cotton can be grown continuously if N is supplied in the fertilizer or as winter legumes (T3 Plots 2,3 and 4) a rotation appears to be of some benefit to cotton (Compare T3 P3 with T4 P6 & 7 or all tiers P12). The maximum yields were obtained in a rotation using legumes. The best 2 year rotation was cotton N followed by winter legumes turned for corn (T3 P9 & 10). The most practical 3-year rotation was cotton N peanuts, W. L., corn (all tiers P15).

Corn

Corn can be grown continuously if N is supplied as a fertilizer or as winter legumes. (T5 Plots 2,3, and 4) a rotation did not appear to be beneficial to corn in these tests.

Fertilizers: All plots had 600# 0-10-4 annually from 1930-39 and 0-8-4 from 1943-44 and 0-8-8 from 1944 to date. When N was used it was 36# from 1940-43 and 48# 1944 to date.

D. G. Sturkie

Table 87A Tuskegee - 1939-1953
Cropping System s
Tier II

Plot No.	Crop	Fertilizer 1/	Rotation	# seed cotton or bu./acre 1939-44	# seed cotton or bu./acre 1945-47	Fertilizer 1/	# seed cotton or bu./acre 1948-53	# seed cotton or bu./acre 1939-53
1	Cotton	6-10-4	Continuous	808	938	6-10-4	1008	914
2	Cotton	0-10-4	2-Yr.	244	748	6-10-4	1080	-
3	Lupines	0-10-4		287 5/	2388 3/	0-10-4	16590	19021
	Corn	0	2-Yr.	5.3	26.3	0	20.8	15.7
4	Cotton	6-10-4	2-Yr.	616	670	6-10-4	1058	804
5	Lupines	0-10-4		241 5/	2105 0/	0-10-4	16597	18081
	Corn	0	2-Yr.	6.1	32.6	6-0-0	25.8	-
6	Cotton	6-10-4	Continuous	608	691	6-10-4	871	730
7 2/	Cotton	6-10-4	2-Yr.	796	877	6-10-4	1143	951
8 2/	Lupines	0-10-4		594 5/	2678 3/	0-10-4	17091	20322
	Corn	0	2-Yr.	13.4	41.7	6-0-0	27.4	-
9	Oats 3/	6-0-0	Spring 3-Yr.	32.6	23.0	6-0-0	49.6	36.6
	Kobe Lesp.	0-10-4		2260 6/	2532	0-0-6	0	1410
10	Lupines	0-10-4		413 5/	None Planted	0-10-4	15570	15570
	Corn	0	3-Yr.	11.4	20.5	6-10-4	23.6	
11	Cotton	6-10-4	3-Yr.	702	740	6-10-4	957	812
12	Cotton	6-10-4	Continuous	762	862	6-10-4	1000	877
13	Cotton 4/	0-10-4	Continuous	624	591	6-10-4	1183	-

1/ All formulas basis 600# per acre. All minerals applied before planting. Nitrogen applied as follows:
To Cotton: 1/3 N as ammonium sulfate plus dolomite to correct acidity, mixed with minerals and applied before planting, 2/3 N as sodium nitrate applied as sidedressing at second cultivation - except on Plot 13 as noted. (Prior to 1948, 1/4 N as sulfate and 3/4 N as soda. No lime - all applied under).
To Corn: All N from soda applied 30-40 days after planting.
To Oats:: All N as soda applied March 1-10.

2/ Two tons dolomite per acre to plots 7 and 8 in fall of 1938.

3/ No minerals: N from soda applied March 1-10. Kobe lespedeza, unfertilized, seeded in oats March 1-10.

4/ All N, L, P & K mixed and applied before planting.

5/ Vetch instead of lupines from 1939-44.

6/ Cowpeas instead of Kobe lespedeza from 1939-44.

CONCLUSIONS - Tier II

Vetch as a green manure crop was unsuccessful when tried for the first six years. Lupine was much more satisfactory.

Lupine increased corn yields about 20 bushels. Lupine residue increased seed cotton yields about 500 pounds when no nitrogen was applied to cotton.

Vetch in the rotation did not increase yields of cotton which received 36 pounds of N.

J. T. Cope, Jr.

Table 87B Cropping Systems- Tuskegee 1939-53

Two and Three Year Rotations of Cotton, Corn, Oats & Lespedeza

Tier I

Plot No	Crop	Fertilizer 1/	Rotation	# Seed Cotton or Bu/A 1939-44	# Seed Cotton or Bu/A 1945-47	Fertilizer 1/	# Seed cotton or Bu/A 1948-53	# Seed cotton or Bu/A 1939-53
1	Cotton	6-10-4	Continuous	689	761	6-10-4	905	790
2	Cotton	0-10-4	2 yr.	226	224	0-10-4	393	293
3	Corn	0-10-4	2 yr.	4.6	5.3	0-10-4	3.1	4.1
4	Cotton	6-10-4	2 yr.	655	729	6-10-4	954	789
5	Corn	6-0-0	2 yr.	20.7	24.9	6-0-0	24.4	23.0
6	Cotton	6-10-4	Continuous	658	770	6-10-4	1010	821
7	Cotton	6-10-4	2 yr.	701	839	6-10-4	1127	899
8	Corn 2/	6-10-4	2 yr.	24.6	29.8	6-10-4	27.5	26.8
9	Oats 4/	6-10-4	3 yr.	45.0	26.9	6-10-4	53.0	44.0
	Kobe Lespedeza				3337	0-0-0	0	1112 5/
10	Corn	6-10-4	3 yr.	19.1	22.7	6-10-4	26.0	22.6
11	Cotton	6-10-4	3 yr.	688	845	6-10-4	1043	861
12	Cotton	6-10-4	Continuous	772	872	6-10-4	1056	906
X	Cotton 3/	0-10-4	Continuous	540	417	6-10-4	1027	

1/ All formulas on basis of 600#/A. All minerals applied before planting; nitrogen applied as follows:
To Cotton: 1/3 N as ammonium sulfate plus dolomite to correct acidity applied at planting, 2/3 N as sodium nitrate applied as side-dressing at second cultivation - except on plot 13 as noted in footnote 3. (Prior to 1948, 1/4 N as sulfate and 3/4 N as soda - no lime - all applied under.)
To Corn: All N from soda applied 30-40 days after planting.
To Oats: All N as soda applied March 1-10.

2/ Minerals under before planting, N applied as side dressing.

3/ All N and minerals applied before planting.

4/ Minerals applied at planting time. N top-dressed March 1-10. Kobe Lespedeza for hay seeded in these oats March 1-10.

5/ 9 year average of 3 crops. Not planted until 1945.

CONCLUSIONS:

Cotton which received 36 pounds of N produced about the same yield when grown continuously as when in 2 or 3 year rotations.

36 pounds of N increased seed cotton yields about 600 pounds and corn yields about 22 bushels.

Average yields from the best treatments over the 15 year period were approximately 900 pounds seed cotton, 25 bushels of corn, and 44 bushels of oats. Kobe Lespedeza failed in most years.

Table 88A The Yields of Crops in Method of Planting Summer Legumes in Corn Experiment[1] at Brewton Field

Treatment	Plot No.	13 Year Average 1931-43 Corn Bu.	Cotton Lbs.	W. Leg. G. Wt. Lbs.	Summer Leg. G. Wt Lbs	Summer Leg. Seed Lbs.
Corn 3.5' row	Ave. Cks. 1,5,9,13 and 17	16.6	509			
Corn and soybeans - same row	2	14.6	670		3843	54
Corn and soybeans - alt. row	3	17.0	755		4973	63
Corn 7.0' row	4	17.6	554			
Corn 36# N	6	35.3	1166			
Vetch - corn	7	27.1	586	6624		
Corn and cowpeas - alt. row	8	13.6	694		4578	174
Corn and velvet beans - alt. row	10	11.8	707		12752	1422
Vetch, corn and soybeans same row	11	22.8	660	5089	4946	46
Corn and crotalaria B. C.	12	24.7	873		8451	169
Corn and peanuts - alt. row	14	18.1	694		3313[2]	361[2]
Corn and crotalaria - alt. row	15	23.4	921		11682	312
Corn and crotalaria - same row	16	23.7	814		9822	290

1/ The crops are in a 2 year rotation of corn and cotton. The fertilizer consists of 600# of 0-10-4 applied to cotton except plot 6 which gets 6-10-4 to cotton and 6-0-0 to corn.

2/ 12 year average on plot 14 - crotalaria on plot 14 in 1931.

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Table 88B . The Yield of Crops in Method of Planting Legumes in Corn Experiment at Brewton Field

Treatment[1]	Plot No.	11 yr. Avg. 1944-54 Corn Bu.	Cotton Lbs.	W. Leg. G. Wt. Lbs.	Summer Legume G. Wt. Lbs.	Seed Lbs.
18# N Corn 3.5' rows	Avg. Cks. 1,5,9,13 and 17	23.2	912			
18# N corn and soybeans alt. row	2	22.6	1108		4181	60
0#N Corn and soybeans alt. row	3	15.8	1100		3522	30
18# N corn 7' row	4	21.5	961			
36# N Corn 3.5' row	6	32.9	1402			
0# N Vetch corn 3.5' row	7	30.3	1049	9157		
0# N Corn and cowpeas alt. row	8	12.7	1031		2460	174
0# N Corn and Velvet beans alt. row	10	12.0	927		8695	934
0# N Vetch, corn, soybeans alt. row	11	25.0	909	8051	3770	54
0# N Corn 7' row crotalaria B. C.	12	23.8	1202		5588	162
0# N Corn and peanuts alt. row	14	15.1	1054		1943	242
18# N Corn 7' row crotalaria B.C.	15	29.1	1250		4945	48
0# N Corn 7' row crotalaria B.C.	16	23.7	1276		5786	90

1/ 2 year rotation of cotton and corn. Rotation receives 600# 0-8-8 all applied to cotton except on plots 7 and 11 where 1/2 goes to cotton and 1/2 to the winter legume. Corn gets amount N indicated and all plots get 18# N to cotton except 6 and 16 which get 36# N.

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Conclusions from Summer Legumes in Corn Experiment

Brewton

1931-43 Results

1. 3.5 ft. rows, 7 ft. rows of corn made the same yields.
2. 36# N increased the yield 18.7 bu.
3. Vetch increased the yield 10.5 bu.
4. Soybeans in corn reduced the increase in yield from vetch 4.3 bu.
5. All summer legumes except crotalaria and peanuts reduced the yield of corn.
6. Crotalaria increased the yield 7 bu. while peanuts increased it 1 bu.
7. 36# N increased cotton yield 652 lbs.
8. Vetch residue increased cotton yield 77 lbs.
9. Summer legumes in corn increased the cotton yield 150# in case of soybeans to 412 lbs. in case of crotalaria. The average increase was 256 lbs. for all summer legumes.
10. The residue of vetch and soybeans increased the yield 604 lbs.

1944-1954

1. 3.5 ft. and 7 ft. rows of corn made the same yield.
2. 36# N increased the yield of corn 9.7 bu. over 18# N.
3. Vetch increased the yield of corn 7.1 bu over 18# N.
4. The value of 18# N could not be determined.
5. Soybeans in corn reduced the increase in yield from vetch 8 bu.
6. The yield of corn was reduced by summer legumes in all cases except that of crotalaria. In this case it was increased slightly.
7. 36# N increased the yield of cotton 490 lbs. above that made with 18# N.
8. Vetch residue increased cotton yields 137 lbs.
9. The increase in yield of cotton from summer legumes varied from 15 lbs. for velvet beans to 338 for crotalaria. The average was 207.
10. Soybeans in corn following vetch decreased the yield of cotton 140 pounds.

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Table 89A Method of Planting Summer Legumes in Corn
Wiregrass Substation 1933-38

Plot No. :	Crop Combination	
Avg. Cks. 1,5,9,13 and 17	Corn 7 foot row.	Cotton No N
2	Corn and Peanuts alternate row. No N	Cotton No N
3	Corn and Peanuts Alternate row. No N	Cotton Vetch No N
4	Corn and Peanuts Alternate row. No N	Cotton 36 # N
6	Corn and Peanuts alternate row 36#N	Cotton 36#N
7	Corn and Soybeans alternate row No N	Cotton No N
8	Corn and Velvet Beans alt. row No N	Cotton No N
10	Corn and cowpeas alt. row No N	Cotton No N
11	Corn and crotalaria alt. row No N	Cotton No N
12	Corn 7 foot row B. C. at last cultivation No N.	Cotton No N
14	Corn in 3.5 ft. row soybeans same row 1/ No N	Cotton No N
15	Corn 3.5 ft. row No N	Cotton No N
16	Corn 3.5 ft. row crotalaria B. C. at last cultivation No N	Cotton No N

Crops are in a 2 year rotation of cotton and corn. All plots received 600# of 0-14-4 to cotton, none to corn. All rows 3.5 ft. unless shown otherwise.

1/ Changed to crotalaria in 1937 and 1938.

Table 89B Methods of Planting Summer Legumes in Corn
Wiregrass Substation 1933-38

Plot No:	1933	1934	1935	1936	1937	1938	6 year average
	In Bushels Per Acre						
Avg. Cks. 1,5,9,13 and 17	18.6	19.6	12.9	8.5	14.2	19.2	15.5
2	11.1	16.4	11.1	7.8	13.1	14.0	12.2
3	15.7	13.0	16.0	8.2	16.6	11.6	13.5
4	10.8	15.9	10.7	7.5	15.7	13.1	12.3
6	13.0	16.0	11.0	9.9	19.5	15.9	14.2
7	8.6	10.6	9.1	8.8	14.2	13.2	10.8
8	4.9	8.5	8.4	8.3	10.3	8.5	8.2
10	7.4	10.7	8.7	7.1	11.4	9.4	9.1
11	14.8	16.4	10.6	5.7	11.8	21.0	13.4
12	16.7	20.4	13.8	7.5	16.7	22.6	16.3
14	13.1	19.9	17.2	7.3	13.4	14.0	14.2
15	18.6	19.5	17.3	9.1	14.6	16.0	15.8
16	17.4	28.2	15.4	8.6	17.4	24.9	18.6

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Table 89C Method of Planting Summer Legumes in Corn
Wiregrass Substation 1933-38

Plot No.	Cotton Yields - Pounds per Acre: 1933	1934	1935	1936	1937	1938	6 year average
Ave. Cks. 1,5,9,13 and 17	970	650	1076	1076	998	924	949
2	1001	801	1251	1253	1069	1143	1086
3	968	799	1177	1375	1143	1060	1087
4	1067	1062	1278	1400	1269	1350	1238
6	1091	965	1296	1521	1359	1406	1273
7	842	601	970	999	1019	1031	910
8	819	745	970	1139	1031	1071	963
10	918	560	1170	1163	1251	965	1005
11	990	637	1298	1204	1393	1125	1108
12	963	727	1211	1278	1213	1244	1106
14	943	835	950	1186	875	1136	987
15	945	761	1004	1067	828	889	916
16	1046	698	1269	1249	1312	1400	1162

Table 89D Method of Planting Summer Legumes in Corn
Wiregrass Substation 1933 - 1938

Summer Legumes Yields

Plot No.			Green Weight and Seed Yields Pounds/A: 1933	1934	1935	1936	1937	1938	6 year ave. 1933-38
2	Peanuts	Green Wt.	2/	3/	2450	3855	1847	6010	3541
		Seed	436	926	609	1459	1071	882	897
		Vetch Green Wt.	5663	457	5118				3746
3	Peanuts	Green Wt.	2/	3/	2951	4291	1792	5850	3721
		Seed	609	849	750	1553	1039	866	944
4	Peanuts	Green Wt.	2/	3/	2505	4269	2091	5528	3598
		Seed	565	948	730	1632	1213	848	989
6	Peanuts	Green Wt	2/	3/	2842	4966	2023	7290	4280
		Seed	480	774	794	1353	1173	651	871
7	Soybeans	Green Wt.	4596	3028	1318	6055	4029	4378	3901
8	Velvet Beans	Green Wt.	9431	7797	8538	8690	2/	8647	8621
		Seed	600	912	2394	1440	947	656	1158
10	Cowpeas	Green Wt.	0	3866	10342	9017	0	4073	4550
		Seed						425	425
11	Crotalaria	Green Wt.	0	11718	8015	13286	1285	4291	6432
12	Crotalaria	Green Wt.	0	12894	8734	9104	4204	2526	6244
14	Soybeans	Green Wt.	3550	1437	4/	4073	1045 1/	2439 1/	2509
16	Crotalaria	Green Wt.	0	11151	5728	6490	2744	2439	4759

1/ Crotalaria in 1937 and 1938 - soybeans in previous years.

2/ No Green wts. taken

3/ Grass worms destroyed peanut leaves

4/ Error - not planted.

Table 89E Method of Planting Summer Legume in Corn
Wiregrass Substation 1939-45

Plot No :	Crop Combination and Nitrogen Fertilization	
1,5,9 13 & 17 Avg. Cks.	Corn 3.5 foot row No N	Cotton No N
2	Corn and peanuts alternate row No N	Cotton No N
3	Corn and peanuts alternate row 36# N	Cotton 36# N
4	Corn and peanuts alternate row No N	Cotton 36# N
6	Corn and peanuts alternate row 36# N	Cotton 36#N
7	Corn and velvet beans alternate row 36# N	Cotton 36# N
8	Corn and velvet beans alternate row No N	Cotton No N
10	Corn 3.5 foot row velvet beans same row No N	Cotton No N
11	Corn 3.5 foot row velvet beans same row 36#N	Cotton 36# N
12	Corn 3.5 foot row velvet beans same row No N	Cotton 36# N
14	Corn 7 foot row crotalaria B. C. at last cultivation 36#N	Cotton 36# N
15	Corn 3.5 foot row 36# N	Cotton 36# N
16	Corn 7' Row crotalaria B, C. at last Cultivation No N	Cotton No N

Crops are in a 2 year rotation of cotton and corn. All plots receive 600 lbs. of 0-8-4 to cotton. None to the corn.

Methods of planting Summer Legumes in Corn
Table 89F Wiregrass Substation 1939-45

Plot No.	Corn Yields In bushels per acre							
	1939	1940	1941	1942	1943	1944	1945	7 year average
1,5,9, 13, & 17 Avg. Cks.	7.2	16.2	18.9	8.5	11.8	11.2	14.3	11.2
2	6.4	13.2	8.9	6.5	9.4	9.9	9.2	9.1
3	11.0	27.1	16.9	24.0	19.1	9.0	12.8	17.1
4	4.9	13.6	10.0	8.5	12.0	6.6	10.5	9.4
6	8.9	22.4	14.9	22.4	14.9	9.5	11.6	14.9
7	4.5	16.7	8.2	15.4	5.9	6.9	5.2	9.0
8	0.9	9.9	7.9	2.4	5.3	7.6	5.1	5.6
10	4.3	13.2	9.8	7.4	1.4	9.4	5.3	7.3
11	16.3	29.7	20.2	22.9	4.4	14.7	10.8	17.0
12	8.0	13.5	14.5	9.3	3.0	13.9	9.7	10.3
14	13.1	27.3	21.9	28.3	26.8	16.8	19.0	21.9
15	23.4	37.9	25.3	32.5	40.8	17.6	29.4	29.6
16	10.4	19.4	17.1	17.4	24.1	16.2	18.2	17.5

D. O. Stanford

Table 89G Method of Planting Summer Legumes in Corn
Wiregrass Substation 1939-45

Plot No.	Cotton Yield - Pounds per acre							
	1939	1940	1941	1942	1943	1944	1945	7 year Avg.
Avg. Cks 1,5,9,13 and 17	440	643	650	481	904	759	654	647
2	547	824	880	551	1055	720	916	785
3	844	1314	1028	1037	1593	961	945	1103
4	765	1292	979	981	1323	839	911	1013
6	686	1316	941	1006	1356	981	977	1038
7	531	1258	929	898	1537	963	898	1002
8	488	1026 1/	686	707	1031	817	686	777
10	549	878 1/	810	569	1136	817	790	793
11	1055	1276	1163	965	1791	1116	972	1191
12	833	1332	1049	959	1656	1053	967	1121
14	990	1611	1163	1357	1444	1222	837	1232
15	909	1485	1202	1211	1503	1222	952	1212
16	689	1375	929	869	1231	1154	932	1026

1/ Lightning struck these two plots plus plot # 9 (in avg. of checks)

Method of Planting Summer Legumes in Corn

Table 89H Wiregrass Substation 1939-45

Plot No.	Crop Seed or Green Wt.	Summer Legume Yield Seed or Green Wt. in Pounds/Acre							7 yr average
		1939	1940	1941	1942	1943	1944	1945	
2	Dry peanuts (seed)	1420	1214	850	899	535	497	593	858
3	Dry peanuts (seed)	1169	996	901	890	519	423	485	769
4	Dry peanuts (seed)	1319	1214	841	906	494	384	631	827
6	Dry peanuts (seed)	1473	992	962	721	459	397	439	778
7	Dry velvet beans	1008	1043	1738	2646	900	671	476	1212
8	Dry velvet beans	886	918	1721	2287	1014	1025	1140	1284
10	Dry velvet beans	368	888	1873	2897	821	767	1304	1274
11	Dry velvet beans	377	858	1917	2919	740	708	453	1139
12	Dry velvet beans	466	875	2374	2929	858	831	939	1325
14	Crotalaria (G. Wt.)	17097	1/ 0	2685	2396	5118	1/ 0	13961	5894
16	Crotalaria (G. Wt.)	18404	1/ 0	2818	3703	5205	1/ 0	14309	6348

1/ No yield - failure

Conclusions for first 6 years (1933-1938)

The Summer legume in corn reduced the yield of corn approximately 4 bushels except when crotalaria was sown bfoadcast at the last cultivation.

The Summer legume in corn prevented any increase in yield of corn from winter legumes plowed under or nitrogen applied as a side dressing (Plots 3 & 6).

The Summer legumes increased the yield of cotton approximately 80 pounds per acre on the average. Crotalaria gave a larger increase in cotton yield than any other legume.

Last 7 years (1939-1945)

The Summer legume in corn had very little effect on the yield of corn when no nitrogen was applied to the corn.

When nitrogen was applied to the corn the summer legume prevented any increase in the corn yield from the nitrogen except when the summer legume was planted at the last cultivation of the corn. Even when planted this late the summer legume reduced the increase from nitrogen approximately one half (see plots 14 and 15).

The summer legume increased the yield of cotton approximately 200 lbs. per acre. Summer legumes should not be planted in corn when the possible yield is 20 or more bushels. per acre. If the yield potential is less than 20 bushels, the value of the summer legume will probably offset the loss (if any) in corn.

D. G. Sturkie

The Yields of Crops in Method of Planting Summer Legumes in Corn - Experiment[1] at Prattville Field

Table 90A 13 year average (1931-1943)

Treatment	Plot No.	Corn Bu.	Cotton Lbs.	W Leg. G. Wt. Lbs.	Summer Legume G. Wt. Lbs.	Summer Legume Seed Lbs.
Corn-3.5' row	Avg. Cks. 1,5,9,13 & 17	12.5	582			
Corn & Soybeans Same row	2	11.1	1002		7378	246
Corn and soybeans alternate row	3	13.2	959		6936	228
Corn 7.0' row	4	13.9	610			
Corn 36# N	6	31.7	1268			
Vetch - Corn	7	33.5	823	9239		
Corn & Cowpeas Alternate row	8	8.8	985		8126	792
Corn & velvet beans alternate row	10	8.0	1177		12185	1038
Vetch corn and soybeans same row	11	25.5	1113	9391	7792	192
Corn and Crotalaria B. C.	12	18.5	924		5754	186
Corn and peanuts alternate row	14	11.6	812		1234[2]	759[2]
Corn and crotalaria alternate row	15	13.6	925		7843	354
Corn and crotalaria same row	16	13.0	894		7331	5.9

1/ The crops are in a 2 year rotation of corn and cotton. The fertilizer consists of 600# of 0-10-4 applied to cotton except plot 6 which gets 6-10-4 to cotton and 6-0-0 to corn.

2/ 12 year average peanuts - crotalaria on plot 14 in 1931.

D. G. Sturkie

Table 90B

The Yield of Crops in Method of Planting Legumes in Corn Experiment at Prattville Field

Treatment 1/	Plot: No.	11 year average 1944-54 Corn Bu.	Cotton Lbs.	W. Leg G. Wt. Lbs.	Summer Legumes G. Wt. Lbs.	Seed Lbs.
18# N Corn 3.5' row	Avg. Cks. 1,5,9 13 & 17	20.1	921			
18# N Corn and Soybeans alternate row	2	24.7	1287		6219	174
0#N Corn soybeans alt. row	3	14.9	1286		6440	198
18# N Corn 7' row	4	21.2	898			
36#NCorn 3.5' row	6	34.6	1249			
0# N Vetch, corn 3.5' row	7	45.6	1220	14428		
0# N Corn and cowpeas alt. rows	8	10.5	1255		8728	708
0# N Corn and velvet beans alternate row	10	11.5	1322		8795	714
0# N Vetch corn soybeans alternate row	11	34.1	1317	14218	6790	246
0# N Corn 7' rows crotalaria B. C.	12	25.3	1274		3556	
0# N corn, peanuts alternate row	14	9.8	1091		1402	736
18# N corn 7' row crotalaria B. C.	15	30.3	1246		2700	
0# N corn 7' row crotalaria B. C.	16	25.1	1453		3551	

1/ 2 year rotation of cotton and corn rotation receives 600# 0-8-4 per acre all to cotton except on plots 7 and 11 where 1/2 is to cotton and 1/2 to winter legume. Corn receive amount N indicated and all cotton plots get 18# N to cotton except plots 6 and 16 which get 36 # N.

D. G. Sturkie

(Conclusions on Back)

Conclusions from Summer Legumes in Corn Experiment
Prattville

1931-43 Results

1. 3.5 ft. row & 7 ft. row of corn made same yield

2. 36# N. increased corn yield 19.2 bu.

3. Vetch increased corn yield 21.0 bu.

4. Soybeans in corn reduced the increase in yield from vetch 8 bu.

5. All summer legumes except crotolaria reduced the yield of corn approximately 1 - 4 bu.

6. Crotalaria increased the yield of corn 6 bu. when broadcast and 1 bu. when in alternate rows.

7. 36# N. increased cotton yield 658 lbs.

8. Vetch residue increased cotton yield 213 lbs.

9. Summer legumes in corn increased cotton yield by 202 lbs. in case of peanuts, 567 lbs. in case of velvet beans. The average increase from all summer legumes was 350 lbs.

10. The residue of vetch and soybeans increased the yield of cotton 503 lbs.

1944-54 Results.

1. 3.5 ft. row & 7 ft. row made same yield.

2. 36# N increased the yield 14.5 bu. over 18# N.

3. Vetch increased the yield 25.5 bu over 18# N.

4. The value of 18# N could not be determined.

5. Soybeans in corn reduced the increase in yield from vetch 11.5 bu.

6. The yield of corn was increased by summer legumes when 18 lbs. of N was applied. The increase was from 4-10 bu. depending on the legume.

7. Vetch residue increased cotton yield 299 pounds.

8. 36# N increased the yield of cotton 328 lbs. above that made with 18# N.

9. Summer legumes in corn increased cotton yield approximately 318 lbs. on the average.

10. There was not a great deal of difference in the increase from various summer legumes.

11. Soybeans in corn following vetch increased the yield of cotton 97 lbs.

D. G. Sturkie

Method of Planting Summer Legumes in Corn

Table 91A — Tennessee Valley Substation 1931-38

Plot No.	Cropping Sequence and Nitrogen Treatment	
Ave. Check 1,5,9,13,17	Corn	Cotton No N[1]
2	Corn and Soybean same row	Cotton No N
3	Corn and Soybean alternate row.	Cotton No N
4	Corn 7 ft. row	Cotton No N
6	Corn 36# N	Cotton 36# N
7	Corn	Cotton Vetch No N[2]
8	Corn Cowpeas Alternate row	Cotton No N
10	Corn and Velvet Beans alternate row	Cotton No N
11	Corn and Soybeans same row	Cotton Vetch No N[2]
12	Corn and Crotalaria B. C. at last cultivation 7 foot row	Cotton No N
14	Corn and Peanuts Alternate row	Cotton No N
15	Corn and Crotalaria alternate row	Cotton No N
16	Corn and Crotalaria same row	Cotton No N

All corn rows 3,55feet unless otherwise shown. All plots receive 600# 0-10-4 per acre applied to the cotton except plots 7 and 11. On plots 7 and 11, 1/2 is applied to the cotton and 1/2 to the vetch. The crops are grown in a 2 year rotation of cotton-corn.

1/ Vetch on all plots except 6, 7, and 11 in 1932 and 1933.
2/ Plots 7 and 11 had vetch 1934-1936. Vetch discontinued after 1936.

Method of Planting Summer Legume in Corn

Table 91B — Tennessee Valley Substation

Plot No.	1931	1932	1933	1934	1935	1936	1937	1938	8 Yr. Ave. 1931-1938
	Yield per acre of Corn in Bushels								
Ave. Checks 1,5,9,13,17	42.6	52.0	44.7	33.8	24.7	35.2	24.0	26.1	35.4
2	31.3	36.4	25.9	23.4	17.1	29.8	19.4	27.6	26.4
3	27.1	31.7	25.5	17.1	11.7	29.1	16.6	25.9	23.1
4	33.1	45.1	22.7	33.2	25.2	31.5	27.3	29.0	30.9
6	46.1	55.3	42.4	35.4	33.0	47.7	40.4	44.4[1]	43.1
7	41.4	50.9	42.5	38.3	23.6	45.1	29.4	32.6[2]	38.0
8	29.8	34.5	26.1	22.4	11.7	35.9	16.2	23.5	25.0
10	25.3	45.5	26.1	15.1	13.3	22.3	19.4	18.2	23.4
11	32.7	37.0	37.1	24.8	8.5	40.8	17.0	28.1[2]	28.2
12	43.1	51.6	37.4	32.3	22.2	33.1	24.9	33.5	34.8
14	39.0	45.8	35.6	21.0	15.3	30.5	18.5	22.7	28.6
15	36.4	42.4	37.2	35.5	15.8	32.0	17.8	20.9	29.8
16	42.4	49.0	45.4	36.4	24.3	35.0	26.7	23.5	35.3

1/ Corn on plot 6 had 36# Nitrogen.
2/ Corn on plots 7 and 11 had vetch turned under until 1936 no vetch since 1936.

D. G. Sturkie

Method of Planting Summer Legumes in Corn

Table 91C Tennessee Valley Substation

Plot No.	Yield of Cotton in Pounds/A								
	1931	1932	1933	1934	1935	1936	1937	1938	Ave. 8 Yr. 1931-1938
1, 5, 9, 13 17 Ave. Cks.	1470	1150	1480	1030	901	1188	1278	1122	1202
2	1420	1204	1767	888	923	1496	1415	1558	1334
3	1359	1368	1683	1169	955	1463	1411	1491	1350
4	1444	1246	1535	1104	878	1305	1232	1226	1246
6 1/	1523	1575	1789	1163	928	1451	1520	1378	1416
7	1537	1172	1436	962	900	1198	1307	1142	1207
8	1402	1305	2000	1132	928	1384	1486	1350	1373
10	1442	1282	1862	1042	1001	1344	1562	1434	1371
11	1483	1381	1711	1243	956	1299	1514	1299	1361
12	1460	1217	1665	999	917	1232	1518	1277	1286
14	1492	1226	1626	1101	951	1373	1385	1378	1316
15	1480	1312	1810	1215	872	1491	1430	1373	1373
16	1478	1244	1609	1258	816	1384	1259	1418	1308

1/ Plot 6 receives 6-10-4, all others receive 0-10-4

Table 91D Method of Planting Summer Legumes in Corn at

Tennessee Valley

Green Weight Yields of Crop of Summer and Winter Legumes

1931-38

Plot No.	Legume	Green Weight - Lbs/A or Dry Weight of Seed-Lbs/A								
		1931	1932	1933	1934	1935	1936	1937	1938	8 Yr. Ave.
2	Soybeans	5175	7132	3443	6075	3330	4005	6593	2903	4832
3	Soybeans	13320	19935	18720	14490	4000	5535	6446	10170	11577
4	Soybeans	(1)	5692	20295	(5)					12994(2)*
7	Vetch	(3)	6970	4356	3920	6534	6316	(6)		5619(5)*
8	Cowpeas	20970	19867	13005	5490	1958	4928	2790	4208	9152
	Seed (dry Weight)	545	(2)	2232	743	495	1466	592	658	962(7)*
10	Velvet Beans	(4)	12802	23850	7965	9270	8190	(7)	6390	11411(6)*
11	Soybeans	5670	6862	5850	5220	4590	5130	4568	7403	5662
	Vetch	(4)	7786	6697	3321	6643	6915	(6)		6272(5)*
12	Crotalaria	(4)	0	5423	900	3660	7875	1755	4500	3445(7)
14	Peanuts	(4)	1127	900	11135	945	2565	1406	1181	5348(7)*
	Seed (dry weight)	(4)	724	1573	1463	461	405	392	292	759(7)*
15	Crotalaria	(4)	21825	11318	3240	4748	7425	3184	4978	8103(7)*
16	Crotalaria	(4)	5332	(4)	8100	2655	3870	1688	9023	5111(6)*

(1) Destroyed by rabbits
(2) Seed yield not given
(3) No vetch planted as test was started in spring of 1931
(4) No yields given
(5) No Soybeans planted after 1933
(6) No vetch planted after 1936
(7) Killed by early frost - no yields given
* Figures in Parentheses () followed by an asterisk indicate the number of years averaged. They are not footnotes.

D. G. Sturkie

Table 91E Method of Planting Summer Legumes in Corn at Tennessee Valley Substation 1939-45

Plot: No :	Cropping Sequence and Nitrogen Treatment Corn	Cotton
1,5,9,13 Ave. and 17 Cks.	Corn	Cotton No N
2	Corn and soybeans same row	Cotton No N
3	Corn and soybeans alternate row	Cotton No N
4	Corn 7 foot row	Cotton No N
6	Corn 36# N	Cotton 36# N
7	Corn and cowpeas B. C. at last cultivation 7 foot row	Cotton No N
8	Corn and cowpeas alternate row	Cotton No N
10	Corn and velvet beans alternate row	Cotton No N
11	Corn and soybeans same row 36 # N	Cotton No N
12	Corn and crotalaria B. C. at last cultivation 7 foot row	Cotton No N
14	Corn and peanuts alternate rows	
15	Corn and crotalaria alternate rows	Cotton No N
16	Corn and crotalaria same row	Cotton No N

All corn rows are 3.5 feet unless otherwise shown. All plots receive 600# 0-8-4 per acre applied to the cotton. No nitrogen used except as shown. Corn receives no fertilizer except nitrogen on plot 6 and 11. The crops are grown in a 2 year rotation of cotton-corn.

Table 91F Method of Planting Summer Legumes in Corn at Tennessee Valley Substation

Plot No:	Yield/A of Corn in Bushels 1939	1940	1941	1942	1943	1944	1945	7 yr. Ave 1939-45	15 yr Ave. 1931-45
Ave. Cks. 1,5,9, 13,17	20.3	19.6	23.4	20.4	20.9	29.5	20.9	22.1	29.2
2	18.8	17.1	21.6	6.6	13.8	25.5	18.2	17.4	22.2
3	19.1	15.0	17.4	8.2	13.9	18.6	12.2	14.9	19.3
4	19.8	20.6	24.1	19.9	22.9	29.3	22.6	22.7	27.1
6	44.0	49.0	43.8	27.0	36.1	45.8	42.8	41.2	42.2
7	22.2	21.7	24.9	22.8	24.1	36.5	24.1	25.2	32.0
8	13.8	14.9	21.5	13.7	10.2	18.6	14.0	15.2	20.4
10	15.9	21.3	13.8	11.5	12.1	27.1	25.9	18.2	20.9
11	27.5	39.5	26.1	7.8	10.1	31.0	15.6	22.5	25.5
12	21.5	26.5	27.0	24.3	23.5	35.0	24.5	26.1	30.7
14	17.6	13.2	21.4	12.6	14.5	24.3	19.7	17.6	23.5
15	22.6	20.8	30.7	19.8	28.9	33.0	25.9	26.0	28.0
16	24.6	22.3	28.0	22.9	28.2	33.7	28.8	26.9	31.4

Table 91G Method of Planting Summer Legumes in Corn at Tenn. V. Substation

Plot No.	Yield of Cotton - Pounds/Acre 1939	1940	1941	1942	1943	1944	1945	7 yr. av: 1939-45	15 yr. ave 1931-1945
Ave. Cks. 1,5,9,13, and 17	1263	950	1387	1034	1099	1190	1096	1146	1176
2	1491	1221	1760	1316	1232	1659	1283	1423	1376
3	1541	1089	1729	1271	1299	1541	1232	1386	1367
4	1238	933	1346	1041	1046	1243	1080	1132	1193
6	1980	1269	1943	1283	1299	1631	1311	1531	1458
7	1350	1000	1766	1125	1305	1395	1311	1322	1261
8	1541	1181	1923	1131	1215	1434	1395	1403	1387
10	1761	1082	1821	1131	1333	1490	1328	1421	1394
11	1671	1036	1907	1136	1249	1513	1355	1410	1384
12	1665	1002	1811	1080	1209	1243	1322	1333	1308
14	1305	1025	1623	1209	1108	1455	1193	1274	1296
15	1575	1211	1765	1305	1226	1423	1232	1391	1381
16	1463	1099	1737	1288	1181	1418	1209	1342	1324

Table 91 H. Method of Planting Summer Legumes in Corn

Tennessee Valley 1939-45 and Fifteen Year Average

Green Weight Yields of Crop of Summer and Winter Legumes

Plot No:	Legume	Green wt. lbs/A or Dry wt. of Seed - lbs/A 1939	1940	1941	1942	1943	1944	1945	7 yr ave.	15 yr. ave.
2	Soybeans	5760	5468	4883	6165	6223	3263	4973	5248	5026
3	Soybeans	5580	12668	13073	11700	10723	10103	9990	10548	11097
7	(1939-45) Cowpeas	416	2644	1935	4388	2295	0	0	1668	1668(7)*
	(1932-36) Vetch									5619(5)
8	Cowpeas	3094	10148	not harvested	5445	5220	10350	6503	6793(6)	8141(14)
	Seed (Dry Wt.)	455	not given	not harvested	not given	732	208	630	506(4)	796(11)
10	Velvet Beans	2891	7425	13095	12308	6570	0	0	6041	8519(13)
11	Soybeans	4545	6818	5288	6143	4860	4248	4455	5194	5444
12	Crotalaria	2588	3218	0	0	0	2228	0	1148	2296(14)
14	Peanuts	2340	3071	4333	4973	9293	5738	4792	4934	5141(14)
	Seed (Dry Wt.)	437	588	808	949	1245	799	788	802	780(14)
15	Crotalaria	5774	5198	0	5873	3420	4275	3150	3856	5980(14)
16	Crotalaria	2298	3416	0	2003	675	675	0	1581	3210(13)

* Figures in parentheses () indicate number of years averaged

Table 91I Method of Planting Summer Legumes in Corn

Tennessee Valley Substation

15 Year Average (1931-45) Yield of Crops as Shown

Plot No.	Corn Bushels	Cotton Pounds	Winter Leg: Green Wt. Pounds	Summer Leg. Green Wt Pounds
1,5,9, 13 & 17 Ave. Cks	29.2	1176		
2	22.2	1376		5026
3	19.3	1367		11098
4	27.1	1193		12994(2)*
6	42.2	1458		
7	32.0	1261	5619(5)	1668(7)
8	20.4	1387		8141(14)
10	20.9	1394		8519(13)
11	25.5	1384	6272(5)	5444
12	30.7	1308		2296(14)
14	23.5	1296		5141(14)
15	28.0	1381		5980 (14)
16	31.4	1324		3210(13)

*Figures in Parenthesis () indicate the number of years averaged

CONCLUSIONS:

Summer legumes planted in corn reduced the yield when they were planted at the same time as the corn. When crotalaria was planted at the last cultivation of corn the yield was not reduced. Summer legumes in corn reduce the increase in yield that would be obtained from winter legumes (compare plots 7 & 11 for the first 8 years). Summer legumes in corn prevent an increase in yield from nitrogen applied to the corn (compare plots 6 & 11 for last 7 years). Summer legumes in corn increased the yield of cotton the next year approximately 180 lbs. (average of 15 years). If the yield of corn is less than 30 bushels per acre, the planting of summer legumes in the corn would be a good practice if cotton is to follow the corn. If the potential yield is above 30 bushels of corn per acre, the summer legumes should not be planted in the corn.

D. G. Sturkie

Table 92 Maintaining Yields Following Perennial Legumes[1]

at Three Locations
1949-54

Plot	Rotation[5]	Pounds of nitrogen per acre[2]	Yield per acre in bushels or pounds					
			Monroeville		Sand Mountain		Prattville	
			1949-51[4]	1952-54	1949-51	1952-54	1949-51	1952-54
1	Corn	72	58.5	28.1	103.5	33.6	50.7	40.8
2	Corn	36	57.5	27.0	94.8	31.4	54.7	38.5
3	Corn	0	51.7	22.6	69.5	16.5	54.0	25.4
4	Corn	0	58.7	28.2	85.5	24.2	50.2	39.6
	Vetch		11550	12425	7031	2627	15850	10100
5	Corn	36	58.8	28.1	95.0	29.7	51.9	42.7
	Vetch		14050	13525	6562	3017	18175	10750
6	Corn	36 + ME[3]	61.8	31.3	92.8	29.3	53.0	45.1
	Vetch		13275	14249	5624	3079	15425	11083
7	Cotton	0	1237	949	926	929	1318	1130
8	Cotton	36	1429	1144	851	836	1411	1255
9	Corn	72	59.2	29.9	1102.2	34.8	54.3	40.9
10	Cotton	72	1321	1138	859	949	1431	1108
11	Cotton	0	1568	1652	1327	1276	1528	1190
	Vetch		12850	13841	5772	1772	20650	20000
	Corn	0	55.9	28.3	116.7	35.3	24.1	23.2
12	Corn	36	66.3	43.3	89.4	69.2	57.3	72.7
	Cotton	36	983	981	208	946	1636	1202
13	Cotton	36	1505	1660	1227	1203	1561	1316
	Corn	36	49.1	26.2	100.1	37.5	39.5	28.3
14	Corn	36	67.4	42.1	97.8	80.3	60.7	64.8
	Cotton	36	954	1033	253	960	1465	1102
15	Cotton	72	1616	1672	1086	1099	1510	1244
	Corn	72	55.5	26.7	114.9	36.4	36.5	26.1
16	Corn	72	67.3	43.0	100.1	86.4	59.1	62.6
	Cotton	72	1143	943	134	972	1305	1047
17	Corn	72	57.9	43.6	101.5	42.4		

1/ Crops following six years of a hay crop of kudzu at Monroeville and Prattville, sericia at Sand Mountain

2/ All plots received 60 lbs. of P_2O_5 and K_2O per acre each year.

3/ Minor element mixture at rate of 5 lbs. borax, 10 lbs. $ZnSO_4$, 10 lbs. $CuSO_4$, 50 lbs. $MgSO_4$, and 10 lbs. $MnSO_4$ per acre.

4/ Vetch yields are for 1950 only.

5/ To determine effect of rotations see averages 1949-54 in record books as a three year average of a two year rotation will contain half the figures that are a single year's yield.

Conclusions:

Monroeville Field

Response from added N on corn small until 1951 when there was a response to 36 lb. N. Cotton responded to added N beginning in 1950. There was no yield increase from nitrogen in addition to vetch. Minor elements had little effect on corn yields. Corn and cotton yielded higher in rotations than when grown continuously.

Continued on Back

Sand Mountain Substation

There was a response to 36 lb. N beginning the first year of the experiment though plots with no nitrogen produced 105 bu. Cotton yields were increased by added nitrogen beginning in 1952. When yields of corn were in the vicinity of 100 bu. there was an increase from nitrogen in addition to vetch, but when yields were lower there was no return from nitrogen in addition to vetch even though vetch yields were not satisfactory. There was a small increase from rotations on both cotton and corn. Minor elements had little or no effect on corn yields.

Prattville

Corn responded to added nitrogen beginning in 1952. Cotton responded to 36 lb. N beginning in 1950. There was no response to nitrogen in addition to vetch on corn. There was little or no effect of minor elements on corn yields. Cotton yields were increased by rotation but there was no effect on corn yields.

C.E. Scarsbrook

Table 93A Sources of Nitrogen for Oats on Sumter Soil

Three Year Averages 1952-54

Black Belt

Source of nitrogen 1/	Forage produced before March 1 Lb. per acre	Grain Bu. per acre
Sodium nitrate	1147	27.8
Ammonium nitrate	1049	27.5
Urea	1045	26.7
Ammonium sulfate	913	25.3
Calcium nitrate	1033	25.9

1/ All plots received 0-16-8 at rate of 1000 lb. per acre. Forty lb. of N applied before planting and 40 lb. after the last clipping around March 1.

Conclusions

Results are as yet inconclusive.

Table 93B Corn After Kudzu

Monroeville Field
1942-53

Plot No	Treatment		Average corn yield in bushels per acre
1	Kudzu 1933-52	Corn 1953	51.0
2	Kudzu 1933-52	Corn 1953	49.8
3	Kudzu 1933-52	Corn 1953	50.4
4	Kudzu 1933-44	Corn 1945-53	39.3
5	Kudzu 1933-44	Corn 1945-53	37.7 1/
6	Kudzu 1933-41	Corn 1942-53	37.2 2/

Kudzu was cut for hay
300 lbs. 18% superphosphate and 75 lbs. of 60% muriate applied in all plots where corn was grown.

1/ No records in 1947 so is 8 year average

2/ No records in 1947 so is 11 yr. average

CONCLUSIONS:

None

C. E. Scarsbrook

Table 94 Production of Alfalfa Following Winter Legumes

Alexandria Field

This alfalfa was planted in the fall of 1945. After the first cutting in 1947, it was decided to check the yields on some of the old winter legume plots. This tier had been in a winter legume test from 1938-45. The area was fertilized with 200# of 50% muriate of potash and 30# of borax after the second cutting.

Plot No.	Previous Crop Grown	Pounds of Alfalfa Hay per Acre. Cutting II	Cutting III	Cutting IV	Total
1	No legume	1440	1190	1050	3680
4	Hairy Vetch	1440	1190	700	3300
6	No legume	1440	1360	1175	3975
7	Crimson Clover	2400	2040	1750	6190
9	Austrian Winter Peas	1760	1530	875	4165
10	No crop	1760	1020	875	3655
Date of Cutting		6-16-47	7-22-47	8-22-47	

CONCLUSIONS:

In 1948 it became apparent that the alfalfa was failing in such scattered areas that there was no relation between the past treatment and crop failure. This area was fertilized with 1000# of 0-14-10.

After cutting for 3 years the stand was so thinned that after the first cutting in 1949, the tier was turned and planted to grain sorghum in July.

D. G. Sturkie

Table 95A The Yield of Sweet Potatoes, Corn, Cotton, Crotalaria and Winter Legumes in Sweet Potato Cropping System Experiment at Brewton

Cropping System and Fertilizer Treatment	Plot Average	Crop	9 year ave. yield 1944-52
Corn and Crotalaria 600# 0-10-6 Continuously (to corn only)	1,5,9 13 & 17	Corn Crotalaria	28.7 9459 1/
Sweet Potatoes 800# 6-10-6 Continuously	8A & 10B	Sweet Pot.	8909
Sweet Potatoes 800# 0-10-6 Winter legume Continuously	10A & 8B	Sweet Pot. Winter Leg.	5466 4732 1/
2 Year Rotation Cotton 600# 6-10-6 Sweet Potatoes 800# 6-10-6	2B, 3B 15A 16A	Sweet Pot Cotton	10268 1037
2 Year Rotation Cotton 600# 6-10-6 Winter legume Sweet Potatoes 800# 0-10-6	2A 3A 15B,16B	Sweet Pot Cotton Winter Leg.	8406 1072 5498 1/
2 year Rotation corn 600# 6-10-6 Sweet Potatoes 800# 6-10-6	4A 4B 14A,14B	Sweet Pot. Corn	10203 29.5
2 year Rotation corn and crotalaria 600# 6-10-6 Sweet Potatoes 800# 3-10-6	6A, 7A 11B, 12B	Sweet Pot Corn Crotalaria	9800 35.8 7445 1/
2 year Rotation corn and crotalaria 600# 6-10-6 Sweet Potatoes 800# 0-10-6	6B 7B 11A 12A	Sweet Pot. Corn Crotalaria	6823 33.4 7506 1/

1/ 8 year average

CONCLUSIONS:

The test was designed mainly for sweet potatoes. There was little if any effect on corn or cotton. Sweet potatoes produced low yields following winter legumes. The largest yields were produced in a rotation of sweet potatoes with cotton or corn when both crops received commercial nitrogen. Crotalaria grown in corn was of little if any value for sweet potatoes grown next year.

D. G. Sturkie

Table 96B **Effect of Hogging and Harvesting Peanuts on Cotton, Corn and Peanut Yields - Wiregrass Substation - Tier 25- 1940-43**

Plot No.	Cropping System and Fertilizer 1/		Yield 4 yr Avg. 1940-43
1	Check - peanuts hogged		1911
2	2 Yr. rotation	Cotton - 600# 6-8-12	1565
3		Peanuts hogged	1980
4	Check - Peanuts hogged		1906
5	2 yr. rotation	Cotton-600# 6-8-12	1200
6		Peanuts hogged	1837
7	2 yr. rotation	Corn	30.5
8		Peanuts hogged	1939
9	Check - Peanuts hogged		1871
10	2 yr. rotation	Corn plus 18# N	31.6
11		Peanuts hogged	1716
12	3 yr. rotation	Corn	26.8
13		Peanuts hogged	1749
14		Peanuts hogged	1732
15	2 yr. rotation	Peanuts hogged	1532
16		Peanuts dug	1522
17	Check - Peanuts hogged		1650

1/ Cotton: 1/4 N applied at planting as $(NH_4)_2SO_4$ and 3/4 N as $NaNO_3$ as a side dressing at first cultivation.
Corn: All N added as a side dressing 35 days after planting as $NaNO_3$.
D. G. Sturkie

Table 96C Effect of Hogging and Harvesting Peanuts on Cotton, Corn and Peanut Yields
Wiregrass Substation Tier 25, 1944-54

Plot No.	Cropping System and Fertilizer[1]		11 Yr. Avg. 1944-54
1	Check - Peanuts hogged 300# 0-12-12		1217
2	2 yr. rotation	Cotton 600# 6-12-12	1108
3		Peanuts hogged	1436
4	Check - Peanuts hogged 300# 0-12-12		1200
5	2 yr. rotation	Cotton - 600# 0-12-12	1031
6		Peanuts hogged	1343
7	2 yr. rotation	Corn - 300# 0-12-12	37.1
8		Peanuts hogged 300# 0-12-12	1364
9	Check - Peanuts hogged 300# 0-12-12		1146
10	2 yr. rotation	Corn 300# 6-12-12	31.9
11		Peanuts hogged 300# 0-12-12	1462
12	3 yr. rotation	Corn - 300# 0-12-12	30.4
13		Peanuts hogged 300# 0-12-12	1296
14		Peanuts hogged 300# 0-12-12	1509
15	2 yr. rotation	Peanuts hogged 300# 0-12-12	952
16		Peanuts harvested 300# 0-12-12	1017
17	Check - Peanuts hogged 300# 0-12-12		1051

1/ Cotton: 1/4 N as $(NH_4)_2SO_4$ at planting and 3/4 N as $NaNO_3$ as a side dressing at first cultivation.
Corn: All N applied as $NaNO_3$ as a side dressing 35 days after planting.

CONCLUSIONS:

Hogging peanuts resulted in higher yields of cotton and corn, than were obtained when the peanuts were harvested
D. G. Sturkie

Table 96D Effect of Hogging and Harvesting Peanuts on Cotton, Corn, and Peanut Yields 1944-1954
Wiregrass Substation Tier 24

Plot No.:	Cropping System & Fertilizer [1]		: 11 Year Av. '44-54
1	Dug Peanuts	300# 0-12-12	1156
	Blue Lupine		402[2][3]
2	2 yr. rotation	Cotton 600# 6-12-12	843
3		Peanuts Harvested	1614
		Blue Lupine	553[4]
4	Check - Peanuts dug	300# 0-12-12	1190
		Blue Lupine	361[2][3]
5	2 yr. rotation	Cotton 600# 6-12-12 and 100# peanut hay	795
6		Peanuts harvested	1440
		Blue Lupine	513[4]
7		Corn 300# 12-12-12	31.9
8	2 Yr. Rotation	Peanuts dug - 300# 0-12-12	1697
		Blue Lupine	512[4]
9	Check - peanuts dug	300# 0-12-12	1153
	Blue Lupine		307[2][3]
10		Corn - 300# 12-12-12 plus 1000# peanut hay	32.6
11	2 yr. rotation	Peanuts dug - 300# 0-12-12	1655
		Blue Lupine	412[4]
12		Corn - 300# 0-12-12	30.0
13	3 yr rotation [2]	Peanuts dug - 300# 0-12-12	1283
		Blue Lupine	400[4]
14		Peanuts hogged - 300# 0-12-12	1384
15	Peanuts hogged Continuously	300# 0-12-12	1112
16	Peanuts dug continuously	300# 0-12-12	1303
	Blue Lupine		226[2][3]
17	Check Peanuts Dug	300# 0-12-12	776
	Blue Lupine		179[2][3]

1/ Cotton: 1/4 N applied at planting as $(NH_4)_2SO_4$ and 3/4 as a side dressing at first cultivation as $NaNO_3$
Corn: All N added as a side dressing 35 days after planting as $NaNO_3$.

2/ Corn following hogged peanuts, harvested peanuts following corn, hogged peanuts following harvested peanuts , blue lupine following harvested peanuts.

3/ 8 year Average of 3 crops.

4/ 8 year Average of 4 crops.

Table 97 The Results of the Experiment - Hogging Vs Digging

Peanuts at Wiregrass
1932-1952
Yields of Cotton, Corn, Peanuts and Vetch

Cropping System and Fertilizer Treatment	Tier	Plot	7 Yr. Avg. 1932-38	14 Yr. Avg. 1939-52	21 Yr. Avg. 1932-52
Continuous peanuts hogged no fert.	33	1	1874	1447[5]	1596[5]
Vetch	34	2	5242[6]		
Continuous peanuts dug no fert.	34	2	1554	496	849
Continuous peanuts dug no fert	35	2	1533		
Continuous cotton 600# 6-10-4[1]	34	1	1300	1136	1191
Continuous Cotton 600#, 6-10-4	35	1	1236		
Continuous corn no fert.	34	3	16.8	10.0	12.2
Continuous Corn no fert.	35	3	19.4		
Continuous corn 600# 6-8-4 (beginning 1939)	35	3		32.2	
2 yr rotation corn no fert.	33	3 &	32.1	38.3	36.2
peanuts hogged no fert.[2]	33	6	1813	1888	1863
2 yr. rotation corn 600# 0-8-4 (beginning 1939)	35	7 &		21.0	
Peanuts dug 600# -0-8-4	35	8		1912	
2 Yr rotation cotton 600# 6-10-4[3]	33	2 &	1452	1089	1210
Peanuts hogged no fert.	33	5	1968	1840	1883
2 yr. rotation cotton 600# 6-8-4 (beginning 1939)	34	7 &		983	
Peanuts dug 600# 0-8-4	34	8		1839	
2 yr. rotation cotton 600# 6-8-8 (beginning 1939)	35	1 &		762	
Peanuts dug 600# 0-8-8	35	2		1656	
2 yr. rotation cotton 600# 6-10-4	34	7 &	1533		
Corn no fert.	34	8	26.0		
2 yr rotation cotton 600# 6-10-4	35	7	1424		
Corn no fert.	35	8	27.4		
3 yr rotation cotton 600# 6-10-4[1]	33	4	1505	1142	1263
peanuts hogged no fert.	33	7 &	1861	1882	1875
corn no fert.	33	8	35.4	37.7	36.9
3 yr. rotation cotton 600# 6-10-4[1]	34	4	1274	714	900
peanuts dug, no fert.	34	5 &	1873	1600	1691
vetch no fert.	34	6	5663[6]		
corn no fert.	34		32.5	17.7	22.6
3 yr rotation cotton 600# 6-10-4[4]	35	4	1246	950	1049
peanuts dug no fert	35	5 &	1841	1655	1718
corn no fert.	35	6	29.1	23.3	25.3

Footnotes on Back

1/ Changed to 600# 6-8-4 beginning in 1939.
2/ Beginning in 1941 changed to corn 600# 0-8-4. Peanuts hogged 600# 0-8-4.
3/ Beginning in 1939 changed to cotton 600# 0-8-4.
Peanuts hogged, no fertilizer.
4/ Beginning in 1939 changed to cotton 600# 6-8-12 peanuts dug no fertilizer.
Corn no fertilizer.
5/ 13 and 20 year averages. No peanuts on plot in 1952. Plot made 4.1 bu. per acre of corn.
6/ 3 year average vetch grown only in 1933, 1934 and 1935.

CONCLUSIONS:

Peanuts were grown continuously on the same area and hogged each year and were making a good yield at the end of 21 years even though no fertilizer was applied during this time.

Digging peanuts continuously resulted in low yield of peanuts in a few years when no fertilizer was applied.

When peanuts are to be harvested, they should be grown in a rotation with other crops. A good rotation was cotton (well fertilized) peanuts - corn.

Hogging peanuts produced larger yields than did digging peanuts even in a 3 year rotation. A good 3 year rotation was cotton - (well fertilized) peanuts (hogged off) corn. This system averaged approximately 12 bushels more corn per acre, 200 lbs. more cotton and 150 lbs. more peanuts than when the peanuts were dug.

D. G. Sturkie

Table 98 Soil Improving Crops and Harvested Peanuts Experiment
Wiregrass Substation and Brewton Experiment Field, 1940-54

15 year average yields of peanuts, cotton, vetch and corn.

			Plots:	Brewton	: Wiregrass	: Average
2-year rotation	600# 6-8-12	to cotton	1,2,8,	1083	1111	1097
	0 Fertilizer	Peanuts	9,16 & 17	1124	1625	1375
2-year rotation	600# 6-4-6	Cotton	3	924	1130	1027
	300 0-8-12	Vetch	4	6641 1/	8772 2/	7707
	0 Fertilizer	Peanuts		1233	1818	1526
3-year rotation	600# 6-8-12	Cotton	5	1227	1290	1259
	0 Fertilizer	Vetch	6	7160 1/	10352 2/	8756
	0 Fertilizer	Peanuts	&	1145	1852	1499
	300# 0-8-12	Vetch	7	7891 1/	7965 2/	7928
	0 Fertilizer	Corn		38.4	38.5	38.5
3-year rotation	600# 6-8-12	Cotton	10	1150	1286	1218
	300# 0-8-12	Vetch	11	8621 1/	9921 2/	9271
	0 Fertilizer	Peanuts	&	1126	1712	1419
	0 Fertilizer	Corn	12	21.7	34.8	28.2
3-year rotation	600# 6-8-12	Cotton	13	1395	1410	1402
	300# 0-8-12	Vetch	14	9021 1/	10334 2/	9678
	0 Fertilizer	Hogged Peanuts	&	1375	1740	1558
	0 Fertilizer	Corn	15	35.0	41.7	38.4

1/ 14 year average. No winter crop in 1940
2/ 12 year average. No winter crop in 1944, 1941, 1942

CONCLUSIONS:

A winter legume turned under ahead of peanuts, increased the yield of peanuts approximately 150 lbs. per acre.

The greatest effect of a soil improving crop was obtained in a 3-year rotation of cotton, winter legume, peanuts, corn. It is probable that a better rotation would have been cotton, peanuts, winter legume, corn.

Hogging peanuts resulted in larger yields of peanuts, corn and cotton than digging peanuts when they were grown in a 3-year rotation of cotton, Vetch, peanuts, corn.

D. G. Stuckie

Table 99 Adaptation of Crotalaria as a Volunteer Crop
Yields of Corn and Cotton

Fertilizer and Cropping System	Crop	Plot	Tenn. V. 5 Yr. Avg. 1935-39	1/ Sand Mt. 4 yr. Avg. 1935-49	Monroe-Wire-grass 4 yr. Avg. 1935-48	Virginia 5 yr. Avg. 1935-39
2 Yr. Rot. cotton 600# 0-10-4	Corn	1,9,8	29.7	10.7	13.4	18.2
Corn no Fert.	Cotton	& 16	1157	787	513	939
2 yr Rot cotton 600# 0-10-4	Corn	2 &	29.7	21.7	24.8	24.5
Corn and Volunteer						
Crotalaria-no fert.	Crotalaria	10	---	7336	8006	8173
	Cotton		1285	1408	924	1221
2 yr. Rot. Cotton 600# 0-10-4	Corn	3 &	28.2	21.2	27.0	24.7
Corn and Crotalaria in drill-no fert.	Crotalaria	11	---	6734	8289	7558
	Cotton		1289	1341	1036	1155
2 yr Rot. cotton 600# 0-10-4	Corn	4 &	34.4	33.2	30.9	26.3
Corn and Crotalaria 18# N	Crotalaria	12	---	5631	7188	3577
	Cotton		1304	1365	991	1094
2 yr. Rot. cotton 600# 0-10-4	Corn	5 &	29.6	43.1	32.7	25.4
Corn and Crotalaria 36# N	Crotalaria	13	---	5304	6200	3381
	Cotton		1242	1346	946	1067
2 yr. Rot cotton 600# 3-10-4	Corn	14	26.8	21.6	23.5	21.5
Corn and Crotalaria no fert.	Crotalaria	&	---	7846	8474	6856
	Cotton	15	1294	1682	1145	1240
Cont. corn and crotalaria 600# 0-10-4	Corn	6	30.1	30.6	25.9	15.9
Each 4 yrs.	Crotalaria		---	6078	6228	5804
Cont. corn and crotalaria 600# 0-10-4	Corn	7	31.2	33.9	27.4	21.2
Each 2 years	Crotalaria		---	7001	6561	7525
Cont. cotton and crotalaria 600# 0-5-2	Cotton	17	1188	894	547	---
	Crotalaria		---	3152	2532	---

1/ No cotton and corn in 1940 at Sand Mountain. Plots were planted to crotalaria which was allowed to go to seed to get a supply of seed in the soil.

CONCLUSIONS:

Growing of crotalaria in corn resulted in larger yields of cotton and corn.
D. G. Sturkie

Table 100 An experiment with volunteer crotalaria in corn with different dates of the last cultivation at Alexandria Field 1935-38

This area (east of Tier 7) was in crotalaria variety tests in 1933 and 1934. Corn has been grown on this area for three years. No fertilizer has been applied. Volunteer crotalaria or crotalaria sown at last cultivation has grown in the corn middles each year. The 1935 crop averaged 25.6 bu. of corn per acre. A fair crop of volunteer crotalaria grew in the corn. The 1936 crop averaged 15.6 bu. of corn per acre. A good growth of crotalaria matured. In 1937 the corn averaged 34.9 bushels per acre. There was a fairly good growth of crotalaria in the corn middles but few seed matured because of late cultivation of corn. The three year average yield of corn has been 25.4 bu. per acre. The average yield of a nearby non-fertilized plot has been 10.7 bu while that of the nearest plots receiving 225 pounds of nitrate of soda per acre has been 27.7 bu. per acre.

On March 26, 1938, 270 pounds per acre of unscarified seed were broadcast over the area. Corn was planted April 27 and cultivation was discontinued on dates listed below. Plot 4 received 225# $NaNO_3$ to corn June 8, 1938.

Plot No.	:Date of last cult.:	Crotalaria #/A:	Corn Bu/A :	Fertilizer/Acre
1	June 6	4500	27.0	0
2	June 13	5280	25.4	0
3	July 1	3504	25.0	0
4	July 1	2526	37.9	225# $NaNO_3$

There was a good stand of crotalaria on all plots. Plots 1 and 2 matured seed before frost but 3 and 4 matured only an occasional plot.

CONCLUSIONS:

It was necessary to lay by corn early to produce a good crop of volunteer crotalaria.

D. G. Sturkie

Note: all plots get each year a total of 400# super and 100# muriate except Plot 13. It gets 400# super and 32# muriate.

1/ The vetch crop in Fall of 1947 received this P & K.
2/ All fertilizer on this plot goes to cotton.

April 12, 1950. 4000# dolomite applied west half of all plots except Plot 10 (It was in oats.)

April 12, 1951. 4000# dolomite applied to east half of each plot except Plot 12 (It was in oats.) Plot 10 received 4000# dolomite on the west and east half.

June 12, 1951. Plot 12 received 4000# dolomite on east half ---thus completing the application to all plots.

D. G. Sturkie

Table 103 Old Rotation Results 1896 - 1931 by 6 year periods

Plot No.	Crop	1896-1901	1902-07	1908-13	1914-19[7]	1920-25[8]	1926-31[13]	Average 1896-1931
1	Vetch						14459	
	Corn	19.7	18.6[3]	18.2	7.2	17.3	24.5	18.930*
2	Corn	18.8	15.6[3]	12.0	3.6	8.3	10.3	12.530*
3	Vetch						9782	
	Cotton	1055	770	725	586	724	1090	85931*
4 & 7	Vetch						13223	
	Cotton	985	751	786	543	772	1143	86931*
5 & 9	Vetch						11216	
	Cotton	1007	784	1061[5]	721	1150	1107	99630*
6	Cotton	931	661	618	533	340	498	61431*
7 & 4	Vetch						12113	
	Corn	18.0	16.8[3]	14.9	5.1	14.2	27.6	17.630*
8	Vetch						10081	
	Cotton	845	666	687	537	566	1065	75831*
9 & 5	Vetch						10793	
	Cowpea Hay					2492[9]	2346	23828*
10	Vetch						9781	
11 & 12	Cotton	804[1]	765	827	549	704	974	80130*
	Vetch						9626	
	Corn	15.92[2]	15.6[3]	14.4	4.2	15.2	26.8	16.829*
	Oats	19.2[2]	18.24[4]	19.66[6]	24.6	6.6	30.2	19.726*
	Cowpea Hay					1424[10]	1690	1652
13	Vetch						10060	
	Cotton	887	668	896	601[14]	690[11]	1161	85415*
	Cowpea Hay					1968[12]	2448	23284*

1/ 5 year Avg. - cowpeas planted in 1896.
2/ 4 year Avg. - cowpeas planted in 1896, records lost in 1900.
3/ 5 year Avg. - eaten by cows in 1902.
4/ 4 year Avg. - oats ruined by chicken in 1905, no records in 1907
5/ 5 year Avg. - peas instead of cotton in 1908.
6/ 5 year Avg. - no record in 1908.
7/ 2 year Avg. - all record lost from 1916-1919.
8/ 5 year Avg. - no record in 1925.
9/ 2 year Avg. - 1923 - 24, first year records given for cowpea hay.
10/ 1 year only - 1924, first year records given for cowpea hay.
11/ 2 year average instead of 3 as are others for this plot; no record in 1925.
12/ 1 year only - 1924; records lost for 1930 and 1922.
13/ Vetch is a 5 year average - no vetch yields recorded in 1928.
14/ One year only - 1915.
*Figures starred indicate the number of years averaged.

D. G. Sturkie

Table 104 Old Rotation Results Since 1932 By 6 Yr. Periods.

Plot No.	Crop	1932-37	1938 - 43	1944 - 49	1950 - 55
1	Cotton	1204	870	574	857
2	Vetch			13900 2/	10593
	Cotton	562	418	832	1684
3	Vetch	5935	5621	7108	9685
	Cotton	1248	1270	1404	1653
4 & 7	Vetch	7656	7535	10476	12846
	Cotton	1386	1478	1688	1848
5 & 9	Vetch	4889	4057	8338	12734
	Cotton	1254	1172	1443	1613
6	Cotton	512	872	335	616
7	Vetch	5120	6352	6200	11417
	Corn	26.4	38.6	43.8	33.1
8	Vetch	4957	6266	7024	12020
	Cotton	1249	1242	1331	1682
9	Vetch	3987	4433	6346	11351
	Cowpea Hay	3071	3735 1/	2592	3172
10	Vetch	6604	4696	9362	12458
11 & 12	Cotton	1349	1091	1361	1727
	Vetch	5895	5389	7767	9955
	Corn	30.4	39.4	48.4	44.2
	Oats	70.7	57.9	45.5	43.1
	Cowpea Hay	2708	2285	3323	3748
13	Vetch	3899	3691	5271	7772
	Cotton	1165	914	654	914
	Cowpea Hay	3055	3184	3126	2322

1/ 5 year average, 1938-42 (In cotton in 1943).
2/ 2 year average, 1948-49.

Table 105 The Yields of Cotton and Corn in Vetch Residue Experiment
Auburn, Alabama 1934-1946, Inclusive
Experiment #1

Plot	Vetch	13-yr. Av. Yield per acre, 1934-46			
		Cotton	Vetch	Corn	Vetch
1	None	411	---	7.7	---
2	Vetch each year	1096	4902 1/	27.7	3411 1/
3	Vetch each two years	962	8147 2/	21.5	5585 2/
4	Vetch each three years	862	7964 3/	23.3	7938 3/
5	None	483	---	9.4	---

1/ Average of 13 crops.

2/ Average of 7 crops.

3/ Average of 5 crops.

Notes: Each plot received 400# super phosphate, 100 lbs. of muriate, and 10 lbs. of zinc sulfate per acre annually to cotton and corn. No fertilizer to the vetch. The crops were grown in a two-year rotation of cotton and corn.

Conclusions: There was a large residual value to the vetch. The largest yields were produced when vetch was grown each year.

D. G. Sturkie

Table 106 The Yields of Corn in Vetch Residue Experiment
Auburn, Alabama, 1947-1955
Experiment #2

The area used in Experiment #1 was used for this experiment. Beginning in 1947 the cropping system was changed to that of continuous corn. On one-half of each plot the corn received only the legume as nitrogen. On the other half it received the legume treatment and an additional 80 pounds of nitrogen from nitrate of soda. The treatments are reversed the next year.

All plots received 400 pounds of superphosphate, 100 pounds of muriate and 10 pounds of zinc sulfate each year to corn. No fertilizer to the vetch.

The Yield of Corn in Vetch Residue Experiment

Plot	Vetch	Yields, 9 yr. avg., 1947-55, Inc. 80# Nitrogen: Corn	80# Nitrogen: Vetch	No Nitrogen: Corn	No Nitrogen: Vetch
1	None	49.6	--	14.2	-- 1/
2	Vetch each yr.	53.8	11,702 1/	52.6	13,814 2/
3	Vetch each 2 yrs.	53.1	18,328 2/	41.5	18,450 3/
4	Vetch each 3 yrs.	53.8	17,330 3/	38.5	18,533 3/
5	None	--	--	14.5	--

1/ Average of 9 crops.
2/ Average of 4 crops.
3/ Average of 3 crops.

Conclusions:

1. A good crop of vetch made more corn than 80 pounds of nitrogen from fertilizer.

2. 80 pounds of nitrogen as a fertilizer applied in addition to vetch produced no significant increase in the yield of corn.

3. There was a marked increase in the yield of corn from the residue of vetch.

4. When 80 pounds of nitrogen was applied in addition to the residue of vetch all plots produced the same yield.

5. When corn does not follow a good crop of vetch it should receive nitrogen in the fertilizer.

6. If the results are considered for the year (1953) producing the largest yield is the 9-year period, the application of 80 pounds nitrogen in the fertilizer in addition to vetch produced on increase of only 10 bushels per acre.

D. G. Sturkie

Table 107 The Yield of Crops in Perennial Legume Rotation Experiment
Auburn, Alabama, 1942-1950

Plot	Cropping System 1/	Crop	3-yr.avg. 1942-44	6 yr.avg. 1945-50
1	Continuous corn 36# N	Corn	38.1	31.9
2	Rotation, 3 yrs. Kudzu	Corn	23.6	30.4 4/
6	6 years corn	Kudzu	2902 2/	3004 2/
3	3 years of Kudzu and 6	Kudzu	2902 2/	3004 2/
4	years of crops. Crops are	Cotton	1038 3/	1076
5	in a three-year rotation	Peanuts	317 3/	996
7	cotton-peanuts-corn.	Corn	39.1 3/	34.9
8				
9				
10	Rotation 3 yrs. sericea	Corn	42.5 3/	25.6
11	6 yrs. Corn	Sericea Hay	3650 2/	2617 2/
		Sericea Seed	--	290 5/
12	Continuous Corn 36#N	Corn	39.9	32.8
13	3-yr. rotation of	Cotton & Peanuts	1184 302	1296 899
14	Cotton, 36#N, Peanuts-Vetch	Vetch	14820	13790
15	Corn	Corn	53.9	52.3
16	Continuous Corn 36#N	Corn	39.5	33.1

1/ The plots in kudzu and sericea were planted to these crops in 1942, and they remained in them for three years. They were plowed up in 1945 and other crops were planted. All plots had 54# P_2O_5 and 30# K_2O per acre per year. Corn got 10# zinc sulfate per acre in the fertilizer ahead of planting. Fertilizer to sericea and kudzu was applied as a top dressing in the spring before growth began.

2/ Kudzu was cut once in June for hay. Sericea was cut once in the spring for hay at height of 12-15 inches.

3/ Had 36# N in 1942, 1943, and 1944.

4/ Corn followed three years of kudzu.

5/ Sericea was cut for seed at frost in the fall.

Conclusions: There was a good response in the yield of crops following a perennial legume. In the case of kudzu, corn following kudzu averaged for the next six years as much as corn receiving 36# Nitrogen that did not follow kudzu. Kudzu produced a larger increase in yield of corn than did sericea.

D.G. Sturkie

Table 108 The Yield of Crops in a Perennial Legume Rotation Experiment at Auburn

1951 - 1955

Plot	Crop Previous 6 years 1945 - 1950 inc.	Crop 1951 - 1955 1/	Crop	Yield - 5 yr. avg. 1951 - 1955
1	Corn 36# N	Continuous Corn 40# N	Corn	32.7
2	Corn	Continuous Corn 80# N	Corn	41.8
3	3 yr. rotation	3 yr. rotation	Cotton	1656
4	Cotton - Peanuts	Cotton 48# N	Peanuts	1889
5	Corn	Peanuts - Vetch	Vetch	17394
		Corn	Corn	47.4
6	Kudzu	3 yr. Rotation	Cotton	1810
7	Kudzu	Cotton 48# N	Peanuts	2103
8	Kudzu	Peanuts-Vetch-	Vetch	19512
		Corn	Corn	55.2
9	Kudzu	Continuous Corn	Corn	44.3
10	Corn	Continuous Corn 80# N	Corn	44.7
11	Sericea	Continuous Corn	Corn	53.4
12	Corn 36# N	Continuous Corn	Vetch	13200
		Vetch	Corn	47.2
13	3 yr. rotation	3 yr. rotation	Cotton	1837
14	Cotton 36# N -	Cotton 48# N	Peanuts	1849
15	Peanuts-Vetch-Corn	Peanuts - Vetch	Vetch	13427
		Corn	Corn	49.8
16	Corn 36# N	Continuous Corn Vetch every other yr. Corn gets 80# N year it does not follow Vetch	Vetch Corn	19300 48.8

1/ Each plot receives 600# 0-8-8 annually. Corn receives 10# zinc sulfate per acre in the fertilizer each year.

CONCLUSIONS:

1. Perennial legumes were valuable for soil building

2. Rotations including legumes were valuable in soil building but the same rotation produced higher yields when the soil was already at high level of fertility when it was begun than it did if the soil was at a low level of fertility. (Compare results on Plots 3, 4 and 5 with those on 6, 7, 8 or 13, 14 & 15)

3. A good crop of vetch produced slightly larger yields of corn than did 80# of Nitrogen from fertilizer.

4. Corn following sericea yielded more than corn following Kudzu for the 1st 4 years after turning. The 5th year the Kudzu produced the largest yield.

5. Peanuts made a very high yield when grown in a good cropping system.

D. G. Sturkie

Table 109 Cropping Systems Following Perennial Legumes
Tennessee Valley Substation 1944-54

Plot No.	Rotation and Fertilizer grade used [1]	Average yield per acre 1944 - 1954								Soybean Hay lb/A
		G. Sorghum bu./A	Oats bu./A	Corn bu./A	Cotton lb./A	Vetch G. W./A	Crimson Clover lb. seed/A	Crimson Clover G.W. lb/A		
1	Corn 0-8-8			39.0	1304					
2	Cotton 0-8-8									
3	Cotton 6-8-8			41.5	1121					
4	Corn 6-8-8									
5	Vetch 0-8-8			39.7	1174	8291 [2]				
6	Cotton 6-8-8									
	Corn									
7	Oats 6-0-0	27.1 [2]	45.6 [3]				237			
	Crimson Clover 0-8-8									
8	Grain Sorghum									
9	Oats 6-0-0		73.0 [3]	47.9	1248					2816 [4]
10	Soybean Hay									
11	Corn 6-8-8									
	Cotton 6-8-8									
12	Oats 6-0-0		61.3 [3]	57.7	1502			25769		
13	Crimson Clover 0-8-8									
14	Cotton 6-8-8									
	Corn 0-8-8									
15	Corn 0-8-8 [5]			47.0	1579					
16	Cotton 0-8-8 [5]									
17	Continuous Cotton 6-8-8				1582					

1/ 600 lb of grade shown per acre
2/ 10 yr. average on vetch and grain sorghum
3/ 9 yr. average on oats
4/ 9 yr. average not reported in 1952 and not harvested in 1954
5/ 6-8-8 grade used beginning in 1948.

C. E. Scarsbrook

e 110 Winter Legume Variety Test - Lafayette Alexandria, Brewton, Monroeville, Prattville 1934-36

Average in Pounds Per Acre - Green Weight and Seed
1st, 2nd, 3rd Cutting and Seed in order listed

me (1)	1934-36 Lafayette				1934-36 Alexandria				1935-36 Brewton				1935-36 Monroeville				1935-36 Prattville				Ave.-all locations (2)			
	1st	2nd	3rd	seed	1st	2nd	3rd (3)	Seed (5)	1st	2nd	3rd	seed	1st	2nd	3rd	seed	1st	2nd	3rd	seed	1st	2nd	3rd	seed
y h	5725	10034	16890	86	2500	5058	6500	156	2191	3628	10234	8	3904	5072	5773	0	5375	9842	13162	264	3968	6863	11578	101
arian h	2203	5060	7065	863	1695	4175	11000	600	876	936	1322	0	1222	2396	2490	0	3750	5525	7062	121	1949	3785	5394	386
ntha h (4) mercial)	5498	7310	10768	138	1596	3940	9000	1064	1434	3176	6868	275	1159	2198	3498	183	5625	10130	14125	235	2929	5223	8835	379
rian Peas ercial)	5495	7279	8905	320	2348	5882	1500	287	4287	4650	6300	2	1603	2088	3901	55	7437	10905	11688	1284	3182	6231	7199	94
on h mon)	3515	6688	13864	26	2032	4400	8500	494	1812	2538	5421	8	3395	5411	5845	0	8000 (6)	14000 (6)	15500 (6)	175 (6)	3187	5742	9792	157
son er ew's Purr	1035	1210	1806	294	1363	3875	8000	881									1050 (6)	1150 (6)	1500 (6)	52 (6)	1178	2344	2984	449
ver(7) on	120	290	290	90	6750	5000	4375	650													3435	2645	2332	370
ver(7) nryus	560	1625	3875	225	14125	11000	24000	600													7342	6312	13938	412
utus(7)																	450	750	1500	52	450	750	1500	52

Continued on Back

(1) Fertilizer: 400# superphosphate per acre (broadcast) at all locations except Alexandria which received 600# basic slag per acre. At Brewton and Monroeville received 50# muriate per acre broadcast.

(2) Weighted average. 3 years results at Lafayette and Alexandria, 2 years at Brewton, Monroeville and Prattville.

(3) Only one year's results for 3rd cutting at Alexandria

(4) 2 year's ave. at Lafayette for Monantha Vetch.

(5) Only 2 years results for seed at Alexandria

(6) Only one years results at Prattville

(7) Only grown 1 year.

Remarks: (1) Hairy vetch averaged producing the most green manure for all cuttings except for Common Burr Clover which was only tested one year at two locations (2) Monantha was one of the lowest in t the production of early green manure (3) Hungarian vetch and crimson clover were among the lowest in the production of green manure. (4) With the exception of Monantha vetch, crimson clover and Common Burr Clover, seed yields were erratic.

E.D. Donnelly

Table 111 Winter Legume Variety Test (1) 1946

Upper Coastal Plain Substation

Variety	Pounds Green Weight per acre
Monantha Vetch	16486
Auburn Woolypod Vetch	16486
Willamette Vetch	14238
Hairy Vetch	11136
Austrian Winter Peas	9787
Blue Lupine	8917
Crimson Clover	1348 (no innoculation)
Dixie Wonder Pea	1165
Monola Vetch	Poor seed - no plants

(1) Nine varieties of winter legumes were planted on Padon soil September 20, 1945. Fertilizer was applied at the rate of 300 pounds per acre of 0-14-10 at planting. Cuttings were made on March 18, 1946.

Remarks: Auburn Woolypod and Monantha vetch were outstanding in the production of green manure.

E. D. Donnelly

Table 112 Winter Legume Variety Test

Viregrass Substation 1939-40

Legume	1939 No. Treatment	1939 450# Basic Slag	1939 450# BS & 45# Muriate	1940 No. Treatment	1940 450# Basic Slag	1940 450# BS & 45# Muriate	Ave. 1939-40 No. Treatment	Ave. 1939-40 450# Basic Slag	Ave. 1939-40 450# BS 45# Muriate
Hairy Vetch	13373	19166	17642	4922	10237	9888	9148	14702	13765
Hung. Vetch	3615	13504	11064	1917	2902	3049	2766	8203	7056
Monantha V.	22651	20081	20909	7362	15507	14201	15006	17794	17555
Oregon Vetch	4922	6882	5489	5576	5314	12458	5249	6098	8974
Smooth Vetch	9845	14113	12023				9845	14113	12023
Austrian Peas	9583	13678	11108	1568	7710	8364	5576	10694	9706
Lathyrus Hirsutus	1176	2265	1437				1176	2265	1437
Crimson Clover	5881	4574	5663	348	1568	1699	3114	3071	3681
Willamette Vetch				4138	9148	10411	4138	9148	10411

Remarks: (1) 450 # of basic slag increased yields over no. treatment.
(2) In 1939 the addition of 45# of muriate of potash decreased yields when compared with the slag treatment (with the exception of monantha vetch and crimson clover)* This did not occur in 1940.
(3) Monantha vetch was outstanding in the production of green manure.

* This decrease may have been due to mixing the fertilizer with the seed. Procedure not given.

Table 113 Winter Legume Variety Test
Early vs. Late Cuttings (2 weeks apart)

Legume	Viregrass 1945 Early	Viregrass 1945 Late	Tenn. Valley 1935,37,38,45 Early	Tenn. Valley 1935,37,38,45 Late	Sand Mountain 1937,38,40,45 Early	Sand Mountain 1937,38,40,45 Late	Avg. All Locations Weighted Avg. Early	Avg. All Locations Weighted Avg. Late
Hairy Vetch	5972	16553	10209 (4)*	12142	8124 (4)	9028	8812	13475
Monantha Vetch			10128 (3)	12668	10844 (3)	12026	10486	12347
Austrian Peas	3354	10454	9447 (4)	12714	6367 (4)	7941	7401	10342
Hungarian Vetch			11689 (3)	12270	4670 (3)	8036	8179	10153
Crimson Clover	6838	25875	17315 (4)	23817	10200 (4)	14504	12989	19906
Oregon Vetch			21562 (1)	19166	6857 (1)	9963	14210	14564
Willamette Vetch	5706	11108	7623 (1)	10890	10482 (2)	13766	8573	12382
Monola Vetch	11021	27966	4356 (1)	15246	13844 (1)	13585	9740	18932
Blue Lupine	25962	44409					25962	44409
Auburn Wooly Pod	10324	24132	3049 (1)	4356	13584 (1)	17784	8986	15424

* Figures in parenthesis represent the No. of years which the average represents.
Remarks: Monola (a vetch variety developed at this station but lost) and Auburn woolypod were outstanding at all locations except the Tenn. Valley. Crimson clover and Oregon (common) vetch averaged more green manure at this location.

Remarks: The following remarks pertain only to those crops or varieties grown at the Tennessee Valley and Sand Mountain Substations for as long as three years: Crimson clover produced more early green manure than any other entry at the Tennessee Valley substation and along with Monantha vetch produced more than the other entries at the Sand Mountain substation.

E. D. Donnelly

Table 114
Results of Winter Legume Variety Test. Monroeville, Three Year Average 1934-36 1/

Entry	Cutting			Mean
	Early	Medium	Late	
Hairy vetch	5403	7214	11,439	8019
Oregon vetch	4098(a)	7806(a)	10,772(a)	7559(a)
Hungarian vetch	3418(a)	4866(b)	5,064(a)	4509(f)
Monantha vetch	5306(b)	9799(b)	9,998(b)	8368
Austrian pea	3735(c)	3392(c)	6,684(c)	4604
Crimson clover	1400(d)	---(e)	---(e)	

(a) Two year average. Severe rabbit damage in 1936.

(b) Very poor stand in 1935.

(c) Large portion of peas dead in 1935.

(d) One-year average, 1934.

(e) Crimson not included in 1935 and 1936.

(f) Weighted average.

1/ No land preparation. Seed broadcast and disced in. Fertilized at the rate of 300# superphosphate in 1934, 1935 and 1936. In 1936 50# muriate of potash per acre was also added. Plot size = 1/435.6 acre.

Summary: Hairy and Monantha vetch averaged producing the most early herbage and produced the highest average for the three cuttings. Monantha failed to come up to a good stand one of the three years.

E. D. Donnelly

Table 115:
Pounds of Green Herbage per Acre Produced by Entries in the Winter Legume Variety Test. Brewton, Three Year Averages, 1934-36[a].

Entry	Cuttings[b]			Mean
	Early	Medium	Late	
Hairy vetch	2244	3152	9123	4840
Oregon vetch[c]	1758	2092	4614	2821
Hungarian vetch	1084	991	1465	1180
Monantha vetch	2406[d]	3734[d]	9012[d]	5051[d]
Austrian pea	5057	5767	8734	6519

(a) No land preparation. Seed sown broadcast and disced in. Area harvested = 1/1,000 acre.

(b) Early = mid March, Medium = last of March, Late = first to middle of April.

(c) Presumably common vetch, V. sativa.

Fertilization:

1934 - 400# superphosphate.
1935 - 200# superphosphate.
1936 - 400# superphosphate and 50# muriate of potash.

(d) Very poor stand 1935 -- practically no herbage produced.

Summary:

Crimson clover dropped after 1934 -- very little herbage produced. Austrian peas averaged producing more early growth and averaged producing the most growth. Oregon and Hungarian produced the least amount of early growth and averaged producing the least amount.

E. D. Donnelly

Table 116 Seed Yields of Winter Legumes. Monroeville, Three Year Average, 1934-36. 1/

Entry	Seed Yield Per Acre			Mean
	1934	1935	1936	
Hairy vetch	0.0	0.0	0.0	0.0
Oregon vetch	0.0	0.0	0.0	0.0
Hungarian vetch	0.0	0.0	0.0	0.0
Monantha vetch	56.0	0.0	349.0	135.0
Austrian pea	0.0	16.8	109.0	42.0
Crimson clover	18.0	--	--	--

1/ Plot size 1/435.6 acre.

Summary:

Seed yields of all entries were neither nil, very poor and/or erratic.

E. D. Donnelly

Table 117 Winter Legume Variety Test
Sand Mountain, Tennessee Valley and Wiregrass
1931-1946
Lbs. Green Weight per Acre

Legume (1)	Sand Mount.: 1931-45	Tenn. V.: 1931-45	Wiregrass: 1933-46	All locations Weighted Average
Hairy Vetch	7074 13/	11730 13/	12417 12/	10354
Monantha V. (commercial)	6010 10/	12967 10/	13775 9/	10819
Austrian Peas	5367 13/	10021 13/	11248 12/	8816
Hungarian Vetch	3912 9/	9656 9/	6937 8/	6831
Crimson Clover	11502 11/	16153 13/	6798 7/	12390
Oregon Vetch (common)	7709 5/	9677 7/	8193 6/	8636
Willamette Vetch	10992 4/	11696 5/	11522 5/	11433
Monola Vetch	9903 3/	7950 3/	13836 4/	10890
Auburn Wooly Pod Vetch	12007 2/	7187 3/	15080 3/	11352
Blue Lupine			25687 4/	25687
Caley Peas	730 1/	5336 2/	2025 2/	3091

1/ Fertilization: Wiregrass 400# basic slag in 1937, 39, 40; 400 # super other years.
Sand Mountain. 400# 0-14-10 in 1941, 45; 600# 6-8-4 in 1942, 43; 400# super all other years.
Tenn. Valley - 600# basic phosphate 1931 to 35; 400# basic slag in 1940, 45; 300# super all other years.

/ Figures in table are the number of years averaged.

Remarks: (1) Auburn wollypod performed well at Sand Mt. and Wiregrass Substations. It appears that it is not adapted to the Tenn. V.

(2) Caley pea yields were very low in these tests.

(3) Auburn woollypod, Hairy, Monantha, Willamette, Monola vetch and crimson clover averaged producing good yields of green manure.

(4) Austrian peas, Hungarian and Oregon (common) vetch averaged producing less green manure than the above.

Table 118 Vetch Fertilizer Placement Test
Alexandria 1932-34

Fertilizer/A	How applied	Seeding: Method	Green Wt. in lbs. per acre 1932	1933	1934	Average 1932-34
None		2 drills per cotton middle	6550	6345	8700	7198
200# Superphosphate	Broadcast	"	8100	10540	14600	11080
400# "	"	"	11040	12585	19150	14258
800# "	"	"	11530	14040	30850	18807
200# "	In furrow	"	9090	12970	19470	13843
400# "	" "	"	10275	13360	17750	13795
None		Broadcast	6325	7500	6500	6775
200# Superphosphate	Broadcast	"	8925	9445	10150	9507
400# "	"	"	9950	13315	11150	11472
800# "	"	"	10400	11575	15450	12475
600# 1/ Basic Slag	"	2 drills per cotton middle		8715	16100	12408

1/ This plot started in 1933. Ave is for 2 years (1933-34)
Method of preparation - none
Seed per acre - 30#
Variety-Hairy Vetch.
Area Harvested - 1/1000 acre

(Continued on Back)

Remarks: (1) Yields increased when vetch seeded in the drill was fertilized with super up to 800 lbs.
(2) There was no difference between 200 and 400 lbs. of super when the fertilizer was applied in the furrow, and the seed in the drill.
(3) Yields increased as the super was increased up to 800 lbs. when both the fertilizer and seed were broadcast.
(4) Yields were higher when seed were in the drill and fertilizer broadcast then when both seed and fertilizer were broadcast.

E. D. Donnelly

ble 119 **Winter Legume** Variety Test. Aliceville, Brewton, Monroeville, Prattville - 1934

Pounds Green Weight by Cuttings and Pounds Seed Per Acre

Variety	Aliceville					Brewton				Monroeville				Prattville				Ave. All locations				
	1st	2nd	3rd	4th	Seed	1st	2nd	3rd	Seed	1st	2nd	3rd	Seed	1st	2nd	3rd	4th	Seed	1st	2nd	3rd	4th(4)	Seed
airy Vetch	5820	7230	8180	13540	139	2350	2200	6900	0	8400	11600	22770	0	6540	12500	15000	16250	287	5778	8382	13212	14895	106
rogon Vetch	3100 (2)	7390 (2)	10000 (2)	12580 (2)	129 (2)	1650	1200	3000	0	4800	10200	15700	0	3260	3800	9000	10500	169	3202	5648	9425	11540	74
ungarian Vetch	4380	6110	3180	7080	168	1500	1100	1750	0	4700	6400	7370	0	2830	3900	4500	4500	222	3352	4378	4200	5790	98
onantha Vetch	4000	6200	11100	18900	60	4350	4850	13300	400	13600	25000	23000	56	8550	19300	21500	21200	138 (3)	7625	13838	17225	20050	164
ustrian Peas			7320	9820	55	6600	8000	13600	60	8000	6000	12250	0	6200	12400	13000	12500	0	5200	6600	11542	11160	29
rimson Clover						50	100	150	2	1400	1600	1800	18						725	850	975		10

1) 400 pounds of superphosphate per acre on each plot.
2) Very uneven growth.
3) Plants destroyed by aphids before formation of seed.
4) 4 cutting average is an average of 2 locations only. Aliceville and Prattville

rks: (1) Monantha generally produced more green manure the earliest cutting than the other entries; Hungarian averaged producing the least on all cuttings with the exception of crimson.
(2) Crimson produced very little green manure.
(3) Seed yields of all entries were erratic and low.

. D. Donnelly

Table 120 Reseeding Legumes for Green Manure in Corn Production
Main Station 1950-52

Crop1/	Green weight in lb./A				Yield of seed in lb./A			Yield of corn in bu./A		
	1950	1951	1952	Average 1950-52	1950	1952	Average 1950 and 1952	1951	1952	Average 1951-52
Button Clover	21,780	6,655	18,312	15,582	460	735	598	64	29	47
Subterranean clover	48,400	19,965	21,800	30,055	213	506	359	80	32	56
Crimson Clover	21,780	13,310	0	11,697	532	0	266	80	32	56
Bur Clover	0	0	13,516	4,505	0	0	0	70	29	49
Smooth Vetch	38,720	12,100	19,184	23,331	484	160	322	71	35	53
Caley peas	21,780	6,050	17,440	15,090	847	789	818	80	36	58
Grandiflora vetch	24,200	15,125	17,004	18,776	605	709	657	81	38	59

1/ Grain sorghum following legume seed crop in 1950 followed by two years of corn. Volunteer stands in 1951 and 1952. All plots received 1 ton lime and 500 lb. 4-10-7 in 1949, 1000 lb. basic slag and 100 lb. muriate each year thereafter, all fertilizer being applied to legumes.

Conclusions

1. Subterranean clover and smooth vetch produced more green manure than other entries

2. Caley peas, Grandiflora vetch and button clover produced more seed than other reseeding legumes in the test

3. There appears to be very little correlation between green manure produced and corn yields in this test. Apparently there was a considerable amount of experimental error in this test.

E. D. Donnelly

Table 121 . Reseeding Legumes
Camp Hill

Crop 1/	Green weight yields in lb. per acre			
	1950	1951 2/	1952 2/	Average 1950-52
Ball clover	41,856	0	29,648	23,835
Caley peas	23,947	12,503	26,160	20,870
Grandiflora vetch	15,260	13,310	18,028	15,533
Manganese bur clover	9,800	0	10,464	6,755
Woollypod vetch	18,314	6,453	13,952	12,906
Crimson clover	14,388	9,680	8,720	10,929
Button clover	17,004	0	17,440	11,481
Subterranean clover	40,548	0	0	13,516
Smooth vetch	22,236	9,377	20,928	17,514

1/ Seed crop made in 1950 followed by grain sorghum. Corn in 1951 and grain sorghum in 1952 following a seed crop. All plots fertilized each year at rate of 600 lb. basic slag and 100 lb. muriate.

2/ Volunteer stands in 1951 and 1952.

Conclusions

Caley peas, smooth vetch, and grandiflora vetch seem to be the best crops for volunteer growth during the period measured.

C. E. Scarsbrook

Table 124 Winter Crop Adaptability Experiment, Brewton Field, 1931-1944

Plot No.	(1) Crop	Yields - Bushels of Corn and Lbs. Green Wt. of Winter Crops 1931-36	1937-42	1943-47	1948-51	21 yr. Avg. 1931-51	Crop	(16) 1952-54
1&16	Corn	15.1	9.0	7.8	38.3	15.1	Corn	45.6
2	Corn	26.9	22.8	36.8	44.6	31.5	Corn	43.2
	Hairy Vetch	4208	3796	11428	5644	6083	Hairy Vetch 22/	10133
3	Corn	29.1	26.6	32.8	42.8	31.9	Corn	37.3
	Monantha Vetch (31-47) Common Vetch (48-51)	5379	6862	6650	5512	6276 (18)	Willamette V. 40#/A	3683
4	Corn	25.9	26.6	32.9	46.1 (13)	31.6	Corn	45.0
	A. W. Peas (31-48) Crimson Clover (49-51)	6254	5501	3254 (11)	16942 (12)	5003 (19)	Blue Lupine 80#/A	25833
5	Corn	13.5	9.0	12.9	36.5	16.5	Corn	43.4
6	Corn	14.0	10.7	22.0 (15)	51.8 (14)	22.2 (17)	Corn	38.2
	Rye (31-48) Crimson (49-51)	2071	2412	3923 (11)	18833 (12)	2802 (19)	Crimson 20# per acre Even Yrs.	8888
7	Corn 2/	21.4	23.8	30.7	38.9	27.6 (17)	Corn	37.5
	Crimson-annually (31-36) Crimson every 3rd Yr. (37-51)	3611	1764 (5)	16675 (6)	11212 (7)	5845 (20)	Crimson 20# per acre Odd Years	9950
8	Corn (3) (Red Clover in '31) Crimson annually	22.0	17.3	33.9	49.2	28.7	Corn	37.0
		4736 (4)	3169	16222	12531	8696 (21)	Crimson 20# per acre Annually	8233
9	Corn	13.5	9.9	10.6	38.1	16.5	Corn	42.3
10&13 1931-40	Corn	24.6 (8)	21.8 (9)	34.4	44.5		Corn	37.0
	A. W. Peas 30#/A							
10-14 1943-51	Blue Lupine 40#/A	5768	2728	10420	13206		Crimson 10#/Ac	8554
11&14 1931-40	Corn A. W. Peas 60#/A	26.4	24.9	34.2	47.4		Corn	37.8
11&15 1943-51	Blue Lupine 60#/A	6752	4263	13502	13141		Crimson 20#/A	11188
12&15 1931-40	Corn A. S. Peas 90#/A	26.4	25.4	33.3	49.0		Corn	38.3
12&16 1943-51	Blue Lupine 80#/A	7865	4782	13995	14416		Crimson 30#/A	13135
16&17 1931-40	Corn A. W. Peas 45#/A	23.8	18.3	14.2	38.7		Corn	33.4
13&17 1943-51	Corn only	4212	3323					

(1) 400# of Super per Acre preceeding winter crop or preceeding corn if no winter crop. From 1932 to 47, the first 3 rows of each plot received 50# of muriate per acre to corn.

(2) Crimson clover, clean seed, planted on plot 6 annually from 1931-36. Beginning in 1937, crimson clover, chaffy seed planted once every 3 years (1939, 1942, etc.). 225# of $NaNO_3$ applied to corn years no clover grown. Phosphate applied to corn years no clover grown.

(3) Chaffy seed each year on plot 8.

(4) 5 year ave. 1932-36. 635# rye grown on plot in 1931.

(5) 2 year ave. of 2 crops (1939 & 1942)

(6) 1 crop only (1945)

(7) 2 yr. average of two crops (1948 & 1951)

(8) Plots 10-17 are five year averages of five crops (1932-36)

(9) Plots 10-17 are 4 year averages (1937-40)

(10) Corn on plots 1, 5, 9, 13 & 17 receive 20# N (125# $NaNO_3$) at planting and 40# Nitrogen (250# $NaNO_3$) at second cultivation. All plots receive 100# of muriate per acre to corn and 400# of super to legumes or to corn if no legume.

(11) A. V. Peas & Rye - 6 year avg. (1943-48).

(12) Crimson Clover - three year average. (49-51).

(13) Plot 4, 1949 - received 400# super, 84# Muriate and 24# N($NaNO_3$).
1951 1951 - 150# $NaNO_3$/A to crimson clover plus P & K
1950 - 800# basic slag & 100# muriate

(14) Plot 6, 1949 - 800# basic slag/A in place of 400# super
1951 - 800# basic slag/A in place of super
1950 - 400# super, 100# muriate and 24# N/A

(15) 375# $NaNO_3$/A applied to plot 6 in 1946, 47 and 48; 125# when rye emerges, 125# just before turning and 125# to corn at second cultivation.

(16) Legume gets 600# basic slag and 100# muriate of potash/A. Corn on plots 1,5,9,13 & 17 gets 100# nitrate of soda, 600# basic slag and 100# muriate/A at planting and 400# $NaNO_3$/A as a side-dressing in two applications.

(17) Crimson clover on plots 6 & 7 every other year. When no clover on plots, they are fertilized same as plots 1,5,9,13 & 17.

(18) 17 year average of monantha vetch (1931-47)

(19) 18 year average (1931-48)

(20) 11 year average of 11 crops over 21 year period

(21) 20 year average of 20 crops (1932-51).

(22) Seeded at the rate of 30#/A
J. T. Cope, Jr.

Table 123 Winter Crop Adaptability Experiment Alexandria Field

1931-1944

Plot No.	Crop	Yields-Bu. of Corn and Lbs. Green Wt. of Winter Crops 1931-35	1936-39	(40,41,43,44)	1942	(10) 14 Yr. Avg. of Legumes 13 Yr. Avg. of corn
1	Corn	9.2	4.2	4.0	862	6.1
2	Corn	7.5	3.1	4.4	1025	5.2
	Rye	1186	1109	1281	825	1165
3	Corn	21.2	29.0	19.7	1338	23.1
	A. W. Peas	8558	7398	3634	6560	6677
4	Corn	21.7	30.8	22.1	1483	24.6
	Hairy Vetch	8852	8144	5896	1970	7206
5	Corn	22.0	33.3	19.3	1272	24.6
	Monantha Vetch	9950	11762	3386	1685	8002
6	Corn	15.3 (1)	7.8	6.3	1096	10.2
7	Corn	29.7	31.8	22.2	1476	28.0
	(Chaffy seed) Crimson Clover	19437 (2)	7846	2664	335	9240 (14)
8 (8)	Corn	28.7	33.8	33.2	1513	31.6
	Crimson Clover	15418 (3)	6188 (13)	0 (11)	435	10640 (15)
9 (9)	Corn	21.9	22.2	23.4	1694	22.5
	A. P. Alt with Rye	5388 (4)	6530 rye 5288 A.P.	3448 rye 7980 A.P.	445 rye	(16) 6218 A.P. 4080 rye
10	Corn	12.5	5.7	6.3	1404	8.5
11	Corn (6)		27.5	29.2	1685	(17) 28.3
12	Corn (7)		29.2	31.2	1894	(18) 30.3
	Rye		(12) 2625	2478	555	(19) 2182

(1) Crimson Clover clean seed on plot in 1931 (yield - 3325#)
(2) 4 year Avg. no clover planted on plot in 1931.
(3) 4 year avg. of 4 crops (red clover on plot in 1931 yield - 2350#)
(4) Two year Avg of two (A. W. Peas) crops (1934-35) None in 33, Burr Clover in 32, Alsike in 1931 (yield 1850#)
(5) All plots receive 400# super/A to legume or to corn if no legume on plot. In 1933 all plots except 9 received 50# of muriate/A to 1/2 of each plot.

(6) 225# of $NaNO_3$ to corn Beginning in 1938.
Lespedeza sod was turned for 1936 crop

(7) Lespedeza sod turned for 1937 crop (1st crop of corn)
225# of $NaNO_3$ to corn beginning in 1938.

(8) Crimson clover, clean seed, used from 1931 to 36. Crimson clover, chaffy seed, used (clover every 3rd year-1939 and 1942 etc.) During years no clover on plot 225# of $NaNO_3$ used to corn.

(9) A. Peas alternate with rye. A. Peas on even years and rye on odd years.

(10) Peanuts in place of corn in 1942 only.

(11) No clover on any of these years

(12) One year only 1939-Rye
Corn 3 year Avg. (1937-39).

(13) 2 year Avg of 2 crops

(14) 13 year Avg of 13 crops. None in 1931

(15) 7 year Avg. of 7 crops over 14 year period

(16) 6 year Avg. of Austrian peas and 5 year Avg. of rye.

(17) 8 year Avg.

(18) 7 year Avg.

(19) 6 year Avg.

J. T. Cope, Jr.

Table124 Winter Crop Adaptability Experiment
Monroeville Field 1931-54

Plot No.	Crop & Treatment(1)	Yields- Bushels of Corn and lbs. Green Wt. of Winter Crop 1931-36	1937-42	1943-47	1948-51	21 yr. Avg. 1931-51(2)	Crop	1952-54(17)
1	Corn	18.2	11.3	11.2	36.6	18.1	Corn	35.5
2	Corn	43.7	33.7	41.9	43.4	40.4	Corn	36.5
	Hairy Vetch	9486	5490	7367	5350(19)	7137(20)	Hairy V.	19591
3	Corn	42.1	27.0	25.9	39.1	33.4	Corn	39.1
	Monantha V.	12688	4861	2766	8850(13)(19)	7007(21)	Willamette Vetch	8183
4	Corn	33.8	19.9	29.4	32.6	28.6	Corn	40.2
	A. W. Peas	5271	2382	2673(12)	11625(11)(14)(19)	3442(22)	Blue Lup.	30017
5	Corn	12.0	6.1	7.7	35.7	13.8	Corn	35.0
6	Corn	14.5	8.4	17.7(16)	56.8	21.6	Corn	39.0
	Rye	2140	1659	2744(12)	26900(11)(15)(19)	2181(22)	Crimson Even Yr.	21838(18)
7	Corn	20.2	26.4	29.6	42.5	28.5	Corn	36.0
	Crimson Clover (9)	2209	4820(4)	700(8)	20200(8)	4379(23)	Crimson Odd Yrs.	19225(18)
8	Corn	29.7	24.9	41.7	53.0	35.6	Corn	35.1
	Crimson Clover (3)	4680	5175	10123	20933(19)	8627(20)	Crimson Annually	17300
9	Corn	15.8	9.4	10.8	36.9	16.8	Corn	33.0
10 & 14 (Avg.)	Corn	41.7	31.8(7)	42.7	49.3		Corn	33.0
	Hairy Vetch	(5)	(6)	(10)	(19)			
	Blue Lup. 40#/A	10563	2338	14957	23433		Crimson 10#/A	12238
11 & 15 (Avg.)	Corn	41.4	30.4(7)	44.3	49.5		Corn	33.6
	Hairy Vetch	(5)	(6)	(10)	(19)			
	Blue Lupine 60#/A	11094	2395	16624	22458		Crimson 20#/A	18658
12 & 16 (Avg.)	Corn	41.7	31.0(7)	44.6	50.8		Corn	32.4
	Hairy Vetch	(5)	(6)	(10)	(19)			
	Blue Lupine 80#/A	9837	2651	20509	23833		Crimson 30#/A	23034
13 & 17 (Avg.)	Corn	41.0	30.8(7)	21.6	42.4		Corn	31.1
	Hairy Vetch	9795(5)	3214(6)					

Table 126 . Mixtures of Alfalfa with Different Species and Rates of Seeding of Grasses with and without Nitrogen at Tennessee Valley 1952

Treatment (1)	Pounds of dry matter by cutting				
	May 8	June 11	Sept. 11	Total	% Grass (2)
Pure Alfalfa	2462	893	682	4037	
Pure Alfalfa + 20# N	2653	932	689	4274	
4# Fescue + 20# N	2520	929	764	4213	2.9
8# Fescue + 20# N	2477	830	816	4123	3.7
12# Fescue + 20# N	2317	802	806	3925	2.5
8# Fescue 0 N	2180	770	744	3694	4.1
4# Orchard 20# N	2154	755	719	3628	7.6
8# Orchard 20# N	2158	716	770	3644	7.9
12# Orchard 20# N	2257	790	834	3881	9.5
8# Orchard 0 N	2294	749	788	3831	11.7

(1). Alfalfa seeded on all plots at the rate of 20 pounds per acre.

(2) The per cent grass was determined for the first cutting only.

Summary

The grasses did not persist beyond the first clipping because of dry weather and the meadow system of management used on the experiment. These results are quite similar to results of other tests in Alabama involving grasses and alfalfa under hay or meadow conditions.

L. J. Chapman

Table 127 Effect of Rate, Date and Method of Seeding Alyce Clover on Yield of Dry Herbage. ------- Aliceville 1940-1941

Treatment	# seed per acre	Planting date 1940	Dry Wt. #/A 1940	Planting Date 1941	Dry Wt. #/A 1941
28" rows	8	May 13	3826	May 9	2916
28" rows	12	May 13	3740	May 9	2786
28" rows	8			June 5	2948
28" rows	12			June 5	2808
Broadcast	1940-15 1941-20	June 21	3566	June 5	2940
Broadcast	20			May 9	3360

The clover planted in rows in 1940 and in rows and broadcast in 1941. Both come up about the same time. Considerable hoeing is necessary usually to keep weeds out of the clover; the later planting date is not as bad, especially the broadcast area.

Remarks. (1) There was no difference in yields from 8 and 12 pounds of seed per acre.
(2) In 1941 the May 9 planting yielded more than the June 5 planting.

Table 127-2 Red Clover Stain Test
Yield of Hay in Pounds Per Acre 1/

Stain	Tallassee 1948	Tallassee 1949	Piedmont 1948	Piedmont 1949	Upper Coastal Plains 1948*	Upper Coastal Plains 1949	Average
Commercial	1448		2484	3580	2161		2418
Ky. 215	1340		2931	3025	2198		2374
M1-16	1282						
M4-13	1261						
M2-16	1257						
Cumberland	1149		2465	3506	2260		2345
M2-44	1045						
Composite 2/	1004						
Midland	992	9227	3125	3212	2223		3756
M4-16	925						
M2-1 (Mc Connico)	909						
Strain M	871	8381	2480	1831	2360		3175
M2-17	834						
M2-20	834						
Wis. M. R. 3/	730		2256	2260	2037		1821
Virginia	709	9828	2901	3440	2000		3776
Louisiana	593	9279	2770	3169	1875		3537
Kenland	577	10474	3032	4187	2049		4064
Drake		10734					
Bruce		9450					

1/ Hay yields expressed at 15% moisture.
2/ Composite of 14 selected plants
3/ Wisconsin Mildew Resistant

* Green wts. converted to dry wts. on basis of 18% dry matter

Remarks: (1) Kenland, Virginia, Midland and Louisiana averaged producing more hay than the other entries.
(2) Three Alabama selections, M1-16, M4-13 and M2-16, were among the top yielders at Tallassee in 1948, indicating the possibilities of improvement in red clover. These were the result of one generation of selection.

E. D. Donnelly

Table 128 Red Clover Strain Test, Tallassee, 1949. Lbs. Hay Per Acre

Stain	Cutting method	Average (4 replications)
Drake (Local Strain)	Hay	10734
	Clip	9155
Konland	Hay	10474
	Clip	8407
Virginia	Hay	9828
	Clip	6713
Midland	Hay	9227
	Clip	7151
Bruce (Local Strain)	Hay	9450
	Clip	6607
Louisiana	Hay	9279
	Clip	6265
Mc Connico (Strain M)	Hay	8381
	Clip	5050

Summary: A comparison of two methods of cutting seven strains of red clover showed that clipping 4 times at monthly intervals produced only 73% as much dry material as cutting twice for hay.

Stand counts were made on all strains. Stands remained considerably longer under hay cuttings than under the clipping treatments. Drake and Bruce strains survived best while Louisiana and Mc Connico lost stands most quickly. Stands of all strains were practically gone by September.

Table 129 Uniform Red Clover Variety Test - Cooperative U.S.D.A. Tallassee Plant Breeding Unit, 1952.

Forage Yields

Entry	Pounds Oven-Dry Forage per Acre by Clipping Dates			
	Mar. 28	May 2	May 27	total
Konland	282	2141	894	3317
Midland	132	1879	952	2963
Tenn Purple Seed	78	1447	774	2298
La. Red	786	2606	514	3906
La. Synthetic No. 1	218	2130	590	2938
L.S.D. 5% level	231.1	543.3	97.8	327.5
C.V.	50.4	17.3	8.5	15.0

Size of plots: Seeded 5 ft. x 20 ft. Harvested 3 ft x 17 ft.

No. of replications: 4

Experimental Design: Randomized complete block

Date Planted: October 10, 1951

Fertilizer: 1,000 pounds 0-16-8 per acre prior to planting.

Lime: Limed to pH 6.5.

Remarks: Louisiana red clover produced more early forage than the other entries and produced significantly more total forage than the other entries.

E. D. Donnelly

Table 130 Summary of White Clover Variety Tests in Alabama

1952 - 54

Variety	Oven-dry forage yields in lbs. per acre						
	PBU			Winfield		Belle Mina	
	1952	1953	1954	1953	1954	1953	1954
Ladino, Oregon	5409	5886	4747	3491	2932	3465	2352
Pilgrim*	4426	5170	3444	3263	3379	3391	1915
La. S-1**	5431	3859	3503	3086	2590	3005	2594
La. White	4494	4550	--	3205	2587	2851	2230
White C., AlaLu	4606	4223	--	3135	2475	3610	2289
White C., Nolin's***	5473	4650	2586	3560	2227	3577	2238
White C., Winfield	4648	4397	--	3178	2513	3445	2414
White C., New Z.	3828	--	--	--	--	--	--

* Also tested under name Breeder Ladino FC23608 and FC23851, was named Pilgrim in 1953.

** Old seed used to establish plots in 1953. The percent viable seed for this seed lot was 68%.

*** This clover has been sold under the varietal names: La. Improved Mother White Clover and La. Improved Giant White Clover.

P. B. Gibson

Table 131 Time of Planting Crimson Clover
Brewton Field

Date of Planting	Green Weight in pounds per acre 1952	Date of Planting	Green Weight in Pounds per acre 1953
8/27/51	none	8/20/52	8150
9/6/51	27700	9/5/52	9300
9/21/51	29000	9/20/52	21900
10/5/51	17400	10/5/52	28000
10/22/51	16800	10/20/52	21500
11/6/51	10800	11/5/52	20100
11/24/51	16000	11/20/52	14100
12/10/51	6700	12/5/52	5400

Seeded at the rate of 30 lbs. per acre
600 lbs. 0-14-14 disked in on day of planting

CONCLUSIONS:

More data is needed before the best planting date can be selected but December is obviously too late and August is too early.

C. E. Scarsbrook

Table 132 Crops for Permanent Pasture
Monroeville and Brewton Field, 1932-1936

Tests were started in 1932 and continued through 1936 on Monroeville Field and Brewton Field to determine the forage yield of certain pasture crops grown alone and the yield and compatibility of lespedeza-grass mixtures under close, frequent mowing. Forage yields are summarized in the tables below.

Although Dallisgrass plots produced the most forage, neither Dallisgrass nor St. Augustine grass produced a complete ground cover during the five year period, and a high percentage of the yield shown for these two species can be attributed to weeds. Weeds also accounted for much of the yield on all plots the first year except those seeded to lespedeza and lespedeza-grass mixtures.

Centipedegrass was the least productive, but it was the most presistent and aggressive species. Centipedegrass, and carpetgrass to some extent, invaded all other plots including those seeded to Bahiagrass.

Lespedeza-centipedegrass and lespedeza-carpetgrass mixtures were more productive than were pure stands of these two grasses during the first two growing seasons, but the stand of lespedeza gradually diminished, leaving almost a pure stand of grass.

New tests of warm-season perennial pasture grasses were started during 1954 at the Black Belt and Lower Coastal Plain Substations and on Experiment Fields near Tuskegee, Prattville, Alexandria, and Brewtom.

Performance of Pasture Crops under Mowing at Monroeville Field, 1932-36.

Crop	Pounds of green forage per acre.					
	1932	1933	1934	1935	1936	Average
Common lespedeza	7847	5887	3953	3759	3597	5009
Lespedeza & carpetgrass	8444	8058	6897	5347	5325	6814
Lespedeza & centipede	8785	6187	4739	3415	3113	5248
St. Augustine	8771	8139	4945	3594	4217	5933
Dallisgrass	7229	7659	7957	6804	7815	7493
Carpetgrass	6355	4474	7086	6608	8131	6531
Bahiagrass	7785	5143	5672	4782	5237	5724
Centipedegrass	4503	2715	3809	3349	3310	3537

Planted March 1932.

Fertilizer Treatment: 4000 lbs. ground oyster shells per acre in 1930; 400 pounds of superphosphate and 50 lbs. muriate of potash per acre in 1930 and 1933; 200 lbs. of nitrate of soda per acre annually to plots with grass.

Performance of Pasture Crops under Mowing at Brewton Field, 1932-36

Crop	Pounds of green forage per acre					
	1932	1933	1934	1935	1936	Average
Common lespedeza	7049	4083	3026	2629	3144	3986
Lespedeza & Carpetgrass	11196	5078	4133	4733	3398	5708
Lespedeza & centipede	8982	4577	3526	4444	2918	4890
St. Augustine grass	9510	4153	3289	4158	4630	5148
Dallisgrass	8105	6264	5258	7107	7347	6816
Carpetgrass	6839	4584	4420	5068	4564	5095
Bahiagrass	7728	4869	1886	3257	3556	4259
Centipedegrass	3934	3243	3124	3034	2396	3146

Planted March 1932.

Fertilized with 400 lbs. superphosphate, 50 lbs. muriate of potash and 4000 lbs. oyster shells per acre in 1930. Plots with grass received 200 lbs. nitrate of soda per acre annually.

W. R. Langford

Grass - Legume mixtures for Permanent Pasture

Tennessee Valley Substation, 1937-41

Several permanent pasture mixtures were planted during the fall of 1937 and spring of 1938. The basic mixture was Kentucky bluegrass, orchardgrass, white clover, Dallisgrass, and common lespedeza. Other mixtures in the test were variations of the basic mixture created by omitting one or more species or by substituting another species for one of the basic constituents. The yield of green forage produced by the different mixtures during the four-year period from 1938 to 1941 inclusive are given in the following Table.

Table 133 Four-Year Average Yield of Pasture Mixtures at the Tennessee Valley Substation, 1938-41.

Plot No.	Fertilizer Treatment 1/	Pasture Mixture	Lbs. of green forage/acre: Before May 16	May 16 to July 2	After July 2	Total
1	2000# dolomite in beginning 600# superphosphate and 75# muriate every 3 years	Kentucky bluegrass, White Cl. Dallisgrass, Common lespedeza	1371	1428	2607	5405
2	"	Ky. bluegrass, White clover, Common lespedeza	1912	1826	2616	6353
3	"	White clover, Dallis grass, Common lespedeza	1221	1708	6002	8930
4	"	Orchardgrass, Dallisgrass, Common lespedeza	2328	1311	3108	6746
5	"	Orchardgrass, White clover, Dallisgrass, Common lespedeza	2458	1471	3159	7088
6	"	Ky. bluegrass, White clover, Dallisgrass, Common lespedeza	2174	1911	3680	7765
7	"	Ky. bluegrass, Orchardgrass, White clover, Dallisgrass, Common lespedeza	2117	1774	3036	6927
8	"	Ky. bluegrass, Orchardgrass, White clover, Dallisgrass, Common lespedeza, Hop clover	2776	1483	3159	7418

W. R. Langford

Table 133 (Cont'd) Four-Year Average Yield of Pasture Mixtures at the Tennessee Valley Substation, 1938-41.

Plot No.	Fertilizer Treatment 1/	Pasture Mixture	Lbs. of green forage/acre: Before May 16	May 16 to July 2	After July 2	Total
9	2000# dolomite in beginning 600# superphosphate and 75# muriate every 3 years	Hop clover, Dallisgrass, common lespedeza	1172	1209	6372	8753
10	"	Hop clover, Common lespedeza	1206	1224	5846	8276
11	"	Ky. bluegrass, Orchard White clover, Dallisgrass, Common lespedeza	1672	1136	3338	6146
12	"	Ky. bluegrass, White clover, Dallisgrass, Common lespedeza	1888	1868	3281	7037
13	"	Ky. bluegrass, Orchardgrass, White clover, Dallisgrass, Common lespedeza	1160	1544	5420	8123
14	"	Ky. bluegrass, Orchardgrass, Common lespedeza	2000	1480	3101	6581
15	" 2/	Ky. bluegrass, Orchardgrass, White clover, Dallisgrass, Common lespedeza	1741	1289	2890	5920
16	"	Common lespedeza, Ky. bluegrass, Orchardgrass, White clover, Dallisgrass,	2025	1639	2893	6556
17	" 3/	Common lespedeza, Ky. bluegrass, Orchardgrass, White clover, Dallisgrass	1156	1296	4405	6857
18	"	Ky. bluegrass, White clover, Dallisgrass, Common lespedeza	2482	2019	3436	7937
19	1000# dolomite in beginning, 300# superphosphate and 75# muriate every 3 years	Ky. bluegrass, White clover, Dallisgrass, Common lespedeza	1063	1158	2684	4905
20	1000# dolomite, 1200# superphosphate and 75# muriate every 3 years	Ky. bluegrass, White clover Dallisgrass, Common lespedeza	2061	;764	3134	6959
21	2000# dolomite, 300# superphosphate, 75# muriate every three years	Ky. bluegrass, White clover Dallisgrass, Common lespedeza	1466	1385	2754	5605
22	2000# dolomite in the beginning, 600# super and 75# muriate every three years	Ky. bluegrass, White clover, Bermuda grass, Common lespedeza	1462	1457	2490	5409

W. R. Langford

1/ One-half of clippings from each sent to Auburn, the remainder distributed over the plots from which they came.

2/ Plot 15 received 200# Nitrate of Soda until grasses were established.

3/ Initial application of fertilizer on Plot 17 made when plants were seeded in the spring; subsequent applications made in the fall.

CONCLUSIONS:

Mixtures that contained a cool season grass, particularly Kentucky bluegrass, were less productive than Dallisgrass-legume mixtures. Seasonal yields show that Dallisgrass-legume mixtures were less productive during the spring than those containing a cool season grass, but this difference during the spring was more than compensated for by the vigorous growth of Dallisgrass during July and August.

By 1941 the stand of orchardgrass had diminished in all plots where it was seeded; Kentucky bluegrass had invaded all the mixtures and the original plantings had become an almost homogenous mixture consisting largely of bluegrass and white clover with some Dallisgrass on most plots and a small amount of orchardgrass and lespedeza.

W. R. Langford

Table 134 Summer Legume Variety Test
Aliceville - 1938

Plot No.	Crop	Yield of Pounds per acre: Green Wt.	Dry Wt.	Clean Seed
1	Otootan soybeans	13536	3208	521
2	Laredo soybeans	11952	3072	629
3	Mammoth yellow	7884	2231	770
4	Tanner soybeans	13068	3228	672
5	Avoyelles soybeans	13032	3792	281
6	Brabham cowpeas	20196	5251	1089
7	Whippoorwill cowpeas	14688	2717	1310
8	Clay Cowpeas	17496	3447	203
9	Improved White Spanish Peanuts			1449
10	Alabama Runner Peanuts			1831

Fertilization: 200 pounds of 6-10-6 per acre.

CONCLUSIONS:

The test was not conducted long enough to form definite conclusions.

D. G. Sturkie

Table 135 Crotalaria Variety Test - Brewton

Variety 1/		1st Planting 2/ 1934	1st Planting 2/ 1935	2nd Planting 3/ 1934	2nd Planting 3/ 1935
Crotalaria retusa	G. W.	5775		14070	
	Seed	326		0	
Early Crotalaria spectabilis	G. W.	14805	27744	15750	23155
	Seed	735	1245	977	1329
Medium Crot. spectabilis	G. W.	24675	36609	10080	25241
	Seed	641	1037	273	845
Late Crot. spectabilis	G. W.	27405	32020	17010	22842
	Seed	977	647	504	501
Crotalaria intermedia	G. W.	20685		2205	
	Seed	378		189	

1/ No fertilizer applied in 1934, 400# super and 50# muriate applied in 1935.

2/ Planted April 18, 1934 and April 30, 1935.

3/ Planted June 12, 1934 and ?

CONCLUSIONS:

The late strain of crotalaria spectabilis produced the largest yield of green material per acre. It also produced seed in this test.

Table 136 Crotalaria Strain Test - Brewton

Strain 1/		1st Planting 2/ 1932	1st Planting 2/ 1933	2nd Planting 3/ 1932	2nd Planting 3/ 1933
Crot. spectabilis 51839	G. W.	20430		not	
	Seed	275		Planted	
Crotalaria striata 74664	G. W.	19620		14400	
	Seed	41		27	
Crotalaria incana 15528	G. W.	20160		7020	
	Seed	104		54	
Crotalaria retusa 36969	G. W.	4365	5296	5085	1123
	Seed	392	690	185	10
Cassia occidentalis	G. W.	4815		5265	
	Seed	284		63	
Sesbania macrocarpa	G. W.	4905	2247	9000	2086
	Seed	207	103	495	48
Crot. spectabilis 64062	G. W.	26460	17655	12960	4815
	Seed	243	1766	108	1011
Crotalaria striata 15843	G. W.	29925		18045	
	Seed	36		6	
Crot. maxillaris 60302	G. W.	4320		6660	
	Seed	284		113	
Crot. grantiana	G. W.		11556		321
	Seed		690		58
Crot. intermedia	G. W.		7223		642
	Seed		270		112
Crot. lanceolate	G. W.		1765		401
	Seed		32		26
Crot. spectabilis 18094	G. W.		13161		4012
	Seed		1589		658
Otootan soybeans	G. W.		10593		4574
	Seed		8		8

1/ No Fertilizer 2/ Planted April 19, 1932 and May 6, 1933
3/ Planted May 27, 1932 and June 26, 1933

CONCLUSIONS: The late strain of Crotalaria spectabilis produced the largest yields of green material.

Table 137 Crotalaria Variety Test, Aliceville, 1934-1935

Variety[3]		1st Planting[1] 1934	1st Planting[1] 1935	2nd Planting[2] 1934	2nd Planting[2] 1935
Early Crot. spectabilis	G. W.	20800	8033	22300	9135
	Seed	1293	336	1046	489
Medium Crotalaria spectabliis	G. W.	19600	9135	20800	8978
	Seed	680	360	397	448
Late Crotalaria spectabilis	G. W.	22400	15225	25200	8951
	Seed	653	0	510	0
Crotalaria retusa	G. W.	8600		13600	
	Seed	376		283	
Crotalaria intermedia	G. W.	12400		12100	
	Seed	552		660	

1/ Planted May 5, 1934, May 16, 1935.

2/ Planted June 14, 1934, June 20, 1935.

3/ No fertilizer applied.

CONCLUSIONS

The late strain of spectabilis produced the larged yields of green weight. It also produced a satisfactory yield of seed.

Table 138 Crotalaria Strain Test
Aliceville 1932

Strain[3]		1st Planting[1] 1932	1st Planting[1] 1933	2nd Planting[2] 1932	2nd Planting[2] 1933
Crotalaria spectabilis 51839	G. W.	14012		22475	
	Seed	0		0	
Crotalaria striata 74664	G. W.	10283		19917	
	Seed	562		257	
Crotalaria incana 15528	G. W.	10927		19452	
	Seed	76		22	
Crotalaria retusa 36969	G. W.	4181	9800	5921	11396
	Seed	587	518	688	lost
Cassia occidentalis	G. W.	3413		5812	
	Seed	283		557	
Sesbinia macrocarpa	G. W.	6678	24360	10540	22540
	Seed	833	633	535	364
Otootan soybeans	G. W.		18620		9870
	Seed		0		0
Crotalaria grantiana	G. W.		11620		15400
	Seed		369		179
Crotalaria intermedia	G. W.		8456		15400
	Seed		302		253
Crotalaria spectabilis 64062	G. W.		25480		21364
	Seed		647		498
Crotalaria lancealata	G. W.		16240		10976
	Seed		417		260
Crotalaria spectabilis 18094	G. W.		22540		20740
	Seed		560		665

1/ Planted April 28, 1932; May 12, 1933
2/ Planted June 11, 1932; June 23, 1933
3/ No fertilizer to crotalaria.

CONCLUSIONS:

The late strain of crotalaria spectabilis produced the largest yields of green material per acre.

D. G. Sturkie

Table 139 Crotalaria Variety Test. Alexandria Field. 1934 and 1935

Variety1/		First Planting2/		Second Planting3/	
		1934	1935	1934	1935
Crotalaria retusa	G. W.	1713		11270	
	Seed	315		0	
Early Crot. spectabilis	G. W.	22199	3900	15314	7372
	Seed	779	417	1061	537
Medium Crot. spectabilis	G. W.	25992	3600	----	5336
	Seed	----	----	----	----
Late Crot. spectabilis	G. W.	36510	9755	22663	4959
	Seed	0	----	0	----

1/ No Fertilizer applied
2/ Planted May 8, 1934 and May 3, 1935
3/ Planted June 15, 1934 and June 24, 1935.

CONCLUSIONS

The late strain of spectabilis produced the largest yields of green material per acre but was too late to produce seed, therefore the early strain is preferable where seed production is a factor.

Table 140 Crotalaria Strain Test. Alexandria

Strain1/		1st Planting2/		2nd Planting3/	
		1932	1933	1932	1933
Crotalaria spectabilis 51839	G. W.	11201		9583	
	Seed	0		0	
Crotalaria striata 74664	G. W.	poor stand not recorded		6845	
	Seed	274		0	
Crotalaria incana 15528	G.W.	11201		7467	
	Seed	134		0	
Crotalaria retusa 36969	G. W.	poor stand not recorded	7469	poor stand no record	4171
	Seed	"	534	"	834
Cassia occidentalis	G. W.	3983		3049	
	Seed	310		118	
Sesbinia macrocarpa	G. W.	6472	9894	7343	8730
	Seed	538	388	257	365
Crotalaria spectabilis 64062	G. W.	14562	9312	7343	11155
	Seed	0	524	0	353
Crotalaria striata 15843	G. W.	10952		5165	
	Seed	0		0	
Crotalaria maxillaris	G. W.	4107		4916	
	Seed	126		0	
Crotalaria grantiana	G. W.		7469		5820
	Seed		No record		No record
Crotalaria intermedia	G. W.		poor stand		3735
	Seed		No record		No record
Crotalaria lanceolate	G. W.		poor stand		3104
	Seed		No record		No record
Crotalaria spectabilis 18094	G. W.		8827		10684
	Seed		534		485
Otootan soybeans	G. W.		15254		8051
	Seed		0		0

1/ 200# superphosphate/A in 1932; no fertilization in 1933
2/ Planted May 5, 1932 and May 6, 1933
3/ Planted June 27, 1932 and June 15, 1933

CONCLUSIONS: The late strain of crot. spectabilis produced the largest green wt./A

Table 141 The yields of green matter and seed in Crotalaria Variety Test at Sand Mountain Substation 1937

Variety	Yield per acre: Green Weight	Seed
Early spectabilis	11928	653
Late spectabilis	14946	0
Spectabilis Auburn No. 5	15904	0
Spectabilis Auburn No 7	15833	0

Planted June 8, 1937

CONCLUSIONS:

The late strains produced the largest yields of green matter. Only the early strain produced seed.

D. G. Sturkie

Table 142 The yields of Crotalaria in Variety Tests at Hackleburg Field in 1934-35

Variety[1]		Yield per acre			
		1st Planting[2]		2nd Planting[3]	
		1934	1935[4]	1934	1935[4]
Crotalaria retusa	G.W.	8448		10032	
	Seed	596		584	
Early Crot. spectabilis	G.W.	11792	9456	13728	5376
	Seed	958		1174	
Medium Crot. spectabilis	G.W.	26224	10080	19184	7584
	Seed	0		0	
Late Crot. spectabilis	G.W.	26752	10848	19360	6960
	Seed	0		0	
Crotalaria intermedia	G.W.	18480		17072	
	Seed	543		537	
Crotalaria intermedia Broadcast	G.W.	12707		16139	
	Seed	---		---	

1/ Fertilizer - none
2/ Planted May 3, 1934
3/ Planted June 16, 1934
4/ By mistake the seed yields of the two plantings were mixed in 1935 so no yields given.

CONCLUSIONS:

Spectabilis late strain produced the largest yield of green matter per acre but did not produce seed. Crotalaria intermedia was best for the production of both seed and green matter.

Table 143 The Yields of species of crotalaria and miscellaneous summer legumes at Hackleburg Field in 1932

Variety[1]		Yield per acre 1932[4]		
		1st Planting[2]	2nd Planting[3]	
Crotalaria spectabilis	G.W.	30058	27738	
Crotalaria striata	G.W.	21357	18099	
Crotalaria incana	G.W.	19097	18630	
Crotalaria retusa	G.W.	8159	7762	
Cassia occidentalis	G.W.	11243	8176	
Sesbania macrocarpa	G.W.	11187	11695	
Crotalaria spectabilis	G.W.	20679	27117	
Crotalaria striata	G.W.	18984	22977	
Crotalaria maxillaris	G.W.	19097	17491	
Crotalaria spectabilis			26289	

1/ Fertilization - none
2/ Planted May 5, 1932
3/ Planted June 14, 1932
4/ No seed data given.

CONCLUSIONS:

The spectabilis specie was best for production of green matter.

D.G. Sturkie

Table 144 Yields of crotalaria in variety test at Lafayette Field 1934-1935

Variety[1]		Yield per acre			
		1st Planting[2]		2nd Planting[3]	
		1934	1935	1934	1935
Crotalaria retusa	G.W.	6178		3672	
	Seed	839		0	
Early Crot. spectabilis	G.W.	16383	8162	11801	7757
	Seed	1610	841	671	345
Medium Crot. spectabilis	G.W.	19664	7820	11346	9653
	Seed	---	434	0	294
Late Crot. spectabilis	G.W.	19776	17771	11971	9385
	Seed	---	215	0	0

1/ No fertilizer applied
2/ Planted: April 26, 1934 and April 30, 1935
3/ Planted: June 19, 1934 and June 17, 1935

CONCLUSIONS:

Crotalaria spectabilis produced the largest yield of green matter.

Table 145 The yield of species of crotalaria and miscellaneous summer legumes at Lafayette Field 1932 - 33.

Crop[1]		Yield per acre			
		1st Planting[2]		2nd Planting[3]	
		1932[4]	1933	1932[4]	1933
Crotalaria spectabilis 51839	G.W.	13358		13068	
	Seed				
Crotalaria striata 74664	G.W.	8857		7550	
	Seed				
Crotalaria incana 15528	G.W.	7521		5024	
	Seed				
Crotalaria retusa 36969	G.W.	3267	4640	5372	5075
	Seed		290		110
Cassia occidentalis	G.W.	7187		5169	
	Seed				
Sesbania macrocarpa	G.W.	4937	4785	4501	2393
	Seed	---	162	---	142
Crotalaria grantiana	G.W.		Poor stand		Poor stand
	Seed				
Crotalaria intermedia	G.W.		Poor stand		1958
	Seed		Poor stand		107
Crotalaria lanceolate	G.W.		Poor stand		3118
	Seed		Poor stand		58
Crotalaria spectabilis 18094	G.W.		9570		5945
	Seed		249		568
Crotalaria spectabilis 64062	G.W.		6670		4133
	Seed		189		450
Otootan soybeans	G.W.		8048		3516
	Seed		0		0

1/ Fertilization - none
2/ Planted April 21, 1932 and May 8, 1933
3/ Planted June 15, 1932 and June 24, 1933
4/ No data on seed - not harvested in 1932

CONCLUSIONS:

Crotalaria spectabilis produced the largest yield of green matter.

D. G. Sturkie

Table 146 The yields of Crotalaria in Variety Test at Prattville Field

1934-35

Variety[1]		Yield per acre			
		1st Planting[2]		2nd Planting[3]	
		1934	1935	1934	1935
Crotalaria retusa	G.W.	8880		4140	
	Seed	998		360	
Early Crot. spectabilis	G.W.	16380	9840	9300	6660
	Seed	924	842	749	707
Medium Crot. spectabilis	G.W.	10560	10740	7824	7320
	Seed	240	806	199	705
Late Crot. spectabilis	G.W.	15600	10560	11820	7440
	Seed	246	108	180	53
Crotalaria intermedia	G.W.	13440		6540	
	Seed	302		101	

1/ Fertilization: none
2/ Planted April 17, 1934, April 23, 1935
3/ Planted May 29, 1934, June 4, 1935

CONCLUSIONS:
Spectabilis produced the largest yields of green matter. It also produced good yields of seed.

Table 147 The yields of species of crotalaria and miscellaneous summer legumes at Prattville Field in 1932-33

Crop[1]		Yield per acre			
		1st Planting[2]		2nd Planting[3]	
		1932	1933[4]	1932	1933[4]
Crotalaria spectabilis 51839	G.W.	23253	25058	15663	5/
	Seed	0		0	
Crotalaria straita 74664	G.W.	9280	31535	18906	16116
	Seed	807		55	
Crotalaria incana 15528	G.W.	22356	4233	14407	12308
	Seed	58		149	
Crotalaria retusa 36969	G.W.	5037	17850	11661	13430
	Seed	741		603	
Cassia occidentalis	G.W.	12696	12325	17940	19210
	Seed	1134		1223	
Sesbania macrocarpa	G.W.	7952	10285	10764	20332
	Seed	420		649	
Crotalaria spectabilis 64062	G.W.	24702	16320	11040	15436
	Seed	0		0	
Crotalaria striata 15843	G.W.	13766	11050	18768	13022
	Seed	1087		52	
Crotalaria maxillaris 60302	G.W.	14766	26894	10074	5/
	Seed	450		500	
Bertram soybeans	G.W.		17935		5/

1/ no fertilizer applied
2/ Planted April 20, 1932, April 27, 1933
3/ Planted June 1, 1932, June 12, 1933
4/ No seed data recorded in 1933
5/ Destroyed by rabbits

CONCLUSIONS: Crotalaria spectabilis striata and incana produced the largest green weight per acre.

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Table 148 The yields of species of crotalaria and miscellaneous summer legumes at Monroeville Field 1932-33

Strain 1/		Yield per acre			
		1st Planting 2/		2nd Planting 3/	
		1932	1933	1932	1933
Crotalaria spectabilis 51839	G.W.	15776		24886	
	Seed	175		80	
Crotalaria striata 74664	G.W.	13776		15110	
	Seed	9		0	
Crotalaria incana 15528	G.W.	6666		11554	
	Seed	0		0	
Crotalaria retusa 36969	G.W.	5333	11877	9332	10272
	Seed	455	2056	590	1569
Cassia occidentalis	G.W.	5777		7555	
	Seed	271		233	
Sesbania macrocarpa	G.W.	5333	7592	5546	10352
	Seed	413	1115	495	648
Crotalaria grantiana	G.W.		14445		1733
	Seed		406		35
Crotalaria intermedia	G.W.		7062		2440
	Seed		838		151
Crotalaria lanceolate	G.W.		5618		2825
	Seed		454		173
Crotalaria spectabilis 18094	G.W.		9229		10593
	Seed		1188		1166
Crotalaria spectabilis 64062	G.W.		15408		12840
	Seed		1551		1179

1/ Fertilization - none
2/ Planted: May 9, 1932 and April 26, 1933
3/ Planted: June 7, 1932 and June 9, 1933

CONCLUSIONS:

Crotalaria spectabilis produced the largest yield of green matter per acre.

Table 149 The yield of crotalaria in Variety Test at Monroeville Field 1934-35

Variety 1/		Yield per acre			
		1st Planting 2/		2nd Planting 3/	
		1934	1935	1934	1935
Crotalaria retusa	G.W.	6000		7063	
	Seed	554		372	
Early Crot. spectabilis	G.W.	19000	11300	11750	11430
	Seed	977	869	735	608
Medium Crot. spectabilis	G.W.	16500	12699	13500	10213
	Seed	626	702	418	563
Late Crot. spectabilis	G.W.	21875	17910	17000	15930
	Seed	843	153	451	104
Crotalaria intermedia	G.W.	7500		2875	
	Seed	109		25	

1/ Fertilization - none in 1934 and 400 # super and 50# muriate in 1935
2/ Planted: April 24, 1934 and April 23, 1935.
3/ Planted: June 6, 1934 and June 3, 1935.

CONCLUSIONS:

Crotalaria spectabilis produced the largest yield of green matter and of seed.

D. G. Sturkie

Table 150 The yield of Crotalaria in variety tests at Gastonburg Field 1934 - 35

Strain[1]		Yield per acre 1st Planting[2] 1934	1935	2nd Planting[3] 1934	1935
Crotalaria retusa	G. W.	4320		4185	
	Seed	166		Not har.	
Early Crotalaria spectabilis	G. W.	15120	14940	9180	24480
	Seed	507	927	322	1102
Medium Crot. Spectabilis	G. W.	25650	22860	17280	24120
	Seed	329	1210	149	1170
Late Crot. spectabilis	G. W.	30780	39060	20070	28980
	Seed	441	1152	256	349
Crotalaria intermedia	G. W.			14580	
	Seed			128	

1/ Fertilization - none in 1934, 600# of 6-10-4 in 1935.
2/ Planted April 18, 1934, and ?
3/ Planted May 31, 1934, and ?

CONCLUSIONS:

Spectabilis was the first specie to use for production of green matter and seed. The late strain usually produces the largest yield of green matter.

Table 151 The yield of Crotalaria in Variety Tests at Gastonburg Field in 1932

Variety		Yield per acre 1932 1st Planting	2nd Planting
Crot. spectabilis	G. W.	22742	13612
	Seed	0	0
Crot. striata	G. W.	15521	21746
	Seed	266	0
Crot. incana	G. W.	15571	13861
	Seed	23	0
Crot. retusa	G. W.	5156	11537
	Seed	789	807
Cassia occidentalis	G. W.	7204	4358
	Seed	283	187
Sesbania macrocarpa	G. W.	21497	14940
	Seed	300	162

Records did not give fertilizer applied if any nor the date of the plantings. No records given for 1933.

CONCLUSIONS:

Crotalaria spectabilis and sesbania macrocarpa produced the largest yields of green matter per acre. The strain of crotalaria spectabilis used did not produce seed hence it must have been a late strain.

D. G. Sturkie

Soybean Variety Testing in Alabama

The Alabama Agricultural Experiment Station cooperates with the United States Regional Soybean Laboratory by planting uniform soybean nurseries at Fairhope, Tallassee, and Belle Mina. Nurseries have been planted for one or more years at Headland, Auburn, Crossville and Camden.

The nurseries include established varieties and experimental strains. These are placed in groups according to relative maturity. In each group an established variety is used as a standard. This standard is used over a long period of time. Other varieties are grown for a sufficient number of years to establish their relative values compared to the standard. Maturity groups V, VI, and VII are planted in Alabama. Group V is the earliest maturity group, group VIII the latest. Groups V and VI are planted at Belle Mina. Groups VI and VII are planted at the other locations.

This program enables the Alabama Experiment Station to determine the relative value of new varieties prior to their release and to participate in the initial release of new varieties. Roanoke, Jackson and Lee are varieties which have come from this cooperative work.

The results of these tests are published annually by the United States Regional Soybean Laboratory.

The yields of some of the popular varieties are listed in the tables below. Mammoth Yellow, Clemson, and CNS are grown on a very small acreage, if any. The reason for including these varieties in the tables was to compare the yields of the old varieties with the improved varieties that are adapted to Alabama. High oil content and resistance to shattering are important characteristics of a variety. Since the oil content of CNS is low it is not recommended. The performance of Hale Ogden and Dortchsoy has been very similar to Ogden.

Average yields are not listed because to compare one variety with a second variety yields for the same years should be considered.

Table 152 Soybean Yields in Central and South Alabama

Soybean Yields at Fairhope

Variety	Yields in Bushels per Acre											
	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Ogden	12.8	-	32.6	11.8	-	29.4	24.9	20.4	42.6	19.3	-	12.5
Lee	-	-	-	-	-	-	-	-	25.2	19.5	-	17.6
Roanoke	-	-	30.7	9.9	-	27.1	28.3	23.7	47.4	21.6	-	16.2
Jackson	-	-	-	-	-	-	-	23.3	48.6	21.3	-	19.4
Mammoth Yellow	5.1	-	-	-	-	-	-	-	-	-	-	-
Clemson	10.0	-	-	-	-	-	-	-	-	-	-	-
CNS	-	-	34.1	21.3	-	22.6	-	-	-	-	-	-

Soybean Yields at Camden

Variety	Yields in Bushels per acre
	1953
Ogden	7.3
Lee	15.3
Roanoke	11.3
Jackson	12.6

Soybean Yields at Auburn

Variety	Yields in Bushels per Acre		
	1943	1944	1945
Ogden	17.4	-	7.8
Roanoke	-	-	8.8
Mammoth Yellow	3.3	-	-
Clemson	2.7	-	-
CNS	-	10.3	10.6

Table 152 (Cont'd) Soybean Yields in Central and South Alabama

Soybean Yields at Tallassee

Variety	Yields in Bushels per Acre								
	1946	1947	1948	1949	1950	1951	1952	1953	1954
Ogden	13.4	-	-	27.1	30.0	17.2	29.8	44.0	20.1
Lee	-	-	-	-	-	35.0	40.7	44.7	21.1
Roanoke	19.3	-	35.2	32.2	27.3	40.6	46.1	48.6	16.7
Jackson	-	-	-	-	35.2	35.6	45.1	47.0	15.0
CNS	18.1	-	36.7	-	-	-	-	-	-

Soybean Yields at Belle Mina

Variety	Yields in Bushels per Acre											
	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Ogden	-	25	-	15.2	11.3	9.6	-	-	12.0	30.0	19.1	-
S-100	-	-	-	-	8.9	17.5	-	-	13.8	20.2	20.0	5.2
CNS	-	23.1	-	13.1	-	2.9	-	-	-	-	-	-
Volstate	-	30.1	-	21.3	12.0	12.8	-	-	-	-	-	-
Roanoke	-	-	-	15.7	10.0	10.3	-	-	-	-	-	-
Dorman	-	-	-	-	-	-	-	-	11.5	23.1	15.4	5.3
Lee	-	-	-	-	-	-	-	-	20.4	28.5	16.5	-

Soybean Yields at Crossville

Variety	Yields in Bushels per Acre						
	1943	1944	1945	1946	1947	1948	1949
Ogden	9.1	-	-	44.6	26.0	31.6	21.4
S-100	14.5	-	-	-	-	27.4	28.3
Volstate	-	-	-	34.5	28.7	32.3	-
Roanoke	-	-	-	36.5	27.0	34.3	-
CNS	-	-	-	16.2	17.2	-	-

Tests have been planted at Headland but were not harvested for yields because of great variations caused by poor inoculation, poor stands and/or drought.

P. B. Gibson

Table 153 Sweet Sorghum Variety Test, 1950-53

Sand Mountain Substation

1. Sweet Sorghum Variety Test

Objective:

To determine the best variety of sweet sorghum for silage and syrup production.

Yields of silage and syrup by different varieties tested from 1950 to 1953 are shown in the following table.

Tons of Silage and Gallons of Syrup per acre produced by Sweet Sorghum Varieties at the Sand Mountain Substation

1950-53

Variety	1950		1951		1952		1953	
	T/A	Gal./A	T/A	Gal./A	T/A	Gal./A	T/A	Gal./A
MN 1090	10.8	234						
SA 169	21.9	480						
White African	19.8	427	15.8	255	14.5	332	13.4	269
Hado	28.2	462	21.0	331	20.6	446		
MN 1034	23.4	519						
MN 1060	14.9	342	15.7	215				
MN 1032			16.4	285			12.6	226
MN 1058 Br.			16.7	314			12.3	198
Tracy (Mer. 51-1)			17.2	306	15.6	379	14.4	288
Williams			16.0	253	13.0	330		
MN 1049			16.3	219				
MN 1056			19.1	291			12.5	195
Sart			20.5	405	17.0	405	13.6	248
Late Orange					11.1	245		
Missouri Grey Top					12.6	263		
Buffalo					12.8	254		
MN 876					11.3	251.	6.7	165
MN 1058R					10.5	223		
Atlas							10.8	193
Mer. 52-2							13.3	211
Mer. 52-3							11.8	230
Mer. 51-2							12.0	219
Mer. 52-1							12.2	204
MN 1052							13.0	219

W. R. Langford

Table 154 Yield of Winter Legumes in the Reseeding Legume Test
Cullars Farm 1950-55

Legume Crop	Green Weight yields lb./A						
	1950	1951	1952	1953	1954	1955	Average 5 years
Block No. 1							
Button clover	38720	6655	18312	13080	No Yields reported in 1954	7430	16839
Subterranean clover	55660	19965	21800	16132		8000	24311
Crimson clover	41140	13310	0	18312		6900	15932
Manganese bur clover	0	0	13516	18748		3840	7220
Smooth vetch	38720	12100	19184	10464		7530	17600
Hairy peas	24200	6050	17440	12208		8790	13738
Grandiflora vetch	31460	15125	17004	10464		5890	15989
Block No. 2							
Button clover	24200	6050	11336	14388		920	11379
Subterranean clover	48400	12100	2616	21800		1240	17231
Crimson clover	24200	16335	0	0		1160	8339
Manganese bur clover	0	0	0	10900		800	2340
Smooth vetch	38720	10890	7848	1744		1380	12116
Hairy peas	21780	8470	13954	3488		2520	10142
Grandiflora vetch	26620	13310	12644	4360		6230	12632
Block No. 3							
Button clover	21780	4840	5232	6104		330	7657
Subterranean clover	48400	9680	6976	7848		0	14581
Crimson clover	21780	12100	0	872		0	6950
Manganese bur clover	0	0	0	8720		0	1744
Smooth vetch	38720	9680	3488	0		0	10378
Hairy peas	21780	4840	5232	0		0	6370
Grandiflora vetch	24200	9075	7848	0		610	8347

Rotation Block 1 - Seed crop, sorghum, corn; Block 2 - Seed crop sorghum, corn, corn; Block 3 - Corn each year after a single seed crop in 1950.

All plots received fertilizer in the fall at the rate of 1000 lb. basic slag and 100 lb. muriate of potash per acre. New seeding of manganese bur made on Block 1 in 1951 and Block 2 and 3 in 1952.

C. E. Scarsbrook

Table 155 Seed Yields and Botanical composition in the Reseeding Legumes Test Cullars Farm

Legume Crops 1/	Yield of seed lb./A 1950	1951	1952	1953	Avg.	Estimated % Botanical Composition of plots on 1 April 1955 2/
Block No. 1						
Button clover	460		735		598	70 button, 30 grandiflora
Subterranean clover	213		506		359	20 button, 70 grandiflora, 20 subterranean
Crimson clover	532		0		266	50 crimson, 40 grandiflora, 10 smooth vetch
Manganese bur clover	0		0		0	100 smooth vetch
Smooth vetch	484		160		322	100 smooth vetch
Hairy peas	847		789		818	100 grandiflora vetch
Grandiflora vetch	605		709		657	100 grandiflora vetch
Block No. 2						
Button clover	512			341	427	100 button clover
Subterranean clover	312			628	470	5 smooth 95 button
Crimson clover	469			0	235	50 button, 50 subterranean
Manganese bur clover	0			0	0	100 button clover
Smooth vetch	726			261	494	100 button clover
Hairy peas	1210			646	928	90 hairy peas, 10 grandiflora
Grandiflora vetch	726			122	424	100 grandiflora

1/ Seed crop made on Block 1 in 1954 but there are no records of yield. The seed crop in 1950 was the only seed crop made on Block 3.

2/ The only legumes found in Block 3 was button clover and grandiflora vetch

All plots received fertilizer at rate of 1000 lb. basic slag and 100 lb. muriate of potash broadcast in fall.

CONCLUSIONS:

1. Grandiflora vetch and button clover have excellent reseeding qualities. Some of these legumes were growing in 1955 from a single seed crop in 1950.
2. Scattering of seed from plot to plot had mixed the legumes. In general grandiflora vetch and smooth vetch become the most dominant legumes on the two year rotation in Block 1. Button clover was the most widespread legume in the three year rotation on Block 2.
3. All plots in the two year rotation in Block 1 produced approximately 75 bushels of corn. On most plots these yields cannot be attributed to the effect of a specific legume because of seed scattering into adjacent plots.
4. Average legume yields should be interpreted with caution because of the generally outstanding yields in 1950.
5. Yields in the three year rotation on Block 2 ranged from an average of 40 bushels of corn following poor crops of manganese bur clover to 55 bushels following generally satisfactory crops of grandiflora vetch.
6. Yields of corn following volunteer legumes from a single seed crop in 1950 were generally in the 15 - 20 bushel range except for the crop in 1951.

C. E. Scarsbrook

Table 156 Yield of Grain in the Reseeding Legume Test - Cullars Farm 1950-1955

Legume Crops	Grain Sorghum Yields Bu/A					Corn Yields Bu./A				
	1950	1952	1953	1954	Average	1951	1952	1953	1954	1955	Average
Block No. 1											
Button clover	0	36	27	21	75	70		83		76	
Subterranean clover	0	30	10	13	71	71		77		73	
Crimson clover	0	38	7	15	83	68		78		76	
Manganese bur clover	0	49	25	25	70	75		81		75	
Smooth vetch	0	44	13	19	86	75		74		78	
Hairy peas	0	32	12	15	75	70		70		72	
Grandiflora vetch	0	38	23	20	83	75		75		78	
Block No. 2											
Button clover	0	9	5	64	29	23	41	39			
Subterranean clover	0	13	7	80	32	25	54	48			
Crimson clover	0	13	7	80	32	27	46	46			
Manganese bur clover	0	8	4	70	29	23	36	40			
Smooth vetch	0	14	7	71	35	22	43	43			
Hairy peas	0	15	8	80	36	28	61	51			
Grandiflora vetch	0	17	9	81	38	29	71	55			
Block No. 3											
Button clover	0			43	18	34	15	22	26		
Subterranean clover	0			52	18	26	17	19	26		
Crimson clover	0			43	12	9	14	13	18		
Manganese bur clover	0			45	17	18	17	16	23		
Smooth vetch	0			39	15	13	15	13	19		
Hairy peas	0			40	16	18	13	16	21		
Grandiflora vetch	0			49	20	26	15	17	25		

Rotation: Block 1 - seed crop, sorghum, corn; Block 2 - seed crop, sorghum, corn, corn; Block 3- corn each year after a single seed crop in 1950.

All plots received fertilizer in the fall at the rate of 1000 lb. basic slag and 100 lb muriate of potash per acre.

C. E. Scarsbrook

Table 157A Time of Planting Cotton Monroeville Field

Date of Planting	Yield Per Acre								Avg.
	1947	1948	1949	1950	1951	1952	1953	1954	1947-1954
March 25	889	201	1434	972	1581	786	1626	1383	1109
April 5	819	1424	1442	1124	1787	816	1815	1312	1318
April 15	928	1504	1558	1130	1766	765	1126	1275	1260
April 25	1067	912	1481	1080	1172	764	1598	1088	1145
May 5	1064	954	1067	805	0 1/	770	1631	382	834

1/ Due to dry weather, cotton did not come up until June

1947 - 49 600# 4-10-4 under and 100# NH_4NO_3 or 200# $NaNO_3$ as a side dressing 32-33# N.

1950-52 600# 4-10-7 under and 32-33# N side dressing

1953-54 600# 4-12-12 under and 32-33# N side dressing

CONCLUSIONS

Planting the 1st 2 weeks in April has produced the highest yields.

D. G. Sturkie

Time of Planting Cotton - Aliceville Field

Table 157B

Date of Planting	Yield per acre							
	1948	1949	1950	1951	1952	1953	1954	Average 1948-54
March 31	1913	1433	1451	1089	611 1/	1368	773	1234
April 10	1838	1377	1415	1017	585	1377	729	1191
April 20	1869	1218	1298	1000	636	999 2/	799	1117
April 30	1488	1364	1332	1104	931	1333	697	1178
May 10	1215	1187	1299	1069	407	1179	702	1008
May 20	1205	945	1011	683	873	1163	629	930

1/ Planted over on April 19

2/ Poor stand on plots planted April 20.

1948 600# 6-8-8
1949 600# 4-10-7 under, 100# $NaNO_3$ side dressing
1950-51 700# 6-8-8
1952-53 600# 6-8-8
1954 600# 8-8-8

CONCLUSIONS:

Planting in April is desirable

D. G. Sturkie

Table 157 Time of Planting Cotton Sand Mountain Substation

Date of Planting:	Yield per acre					
	1950	1951	1952	1953	1954	Average 1950-1954
April 15	566 1/	1020	1060	1102	1011	952
April 25	913	1710	1192	1158	1004	1195
May 5	756	1528	1381	1115	1171	1190
May 15	514	1342	1513	562	1207	1028

1/ Poor Stand.

700# 6-8-8 under in 1950-53. 187.5# soda in 1950, 90.9# NH_4NO_3 in 1951 and 1952, 30# N from soda in 1953 as a side dressing.

450# 4-12-12 and 57# N from NH_4NO_3 in 1954

CONCLUSIONS:

Planting in April is desirable. Planting as late as May 15 results in low yields in most years.

D. G. Sturkie

Table 157D Time of Planting Cotton - Prattville Field

Date of Planting	Yield per acre								
	1947	1948	1949	1950	1951	1952	1953	1954	Avg. 1947-1954
March 25	844	1235	1388	1325	1398	1302	1435	1301	1278
April 5	827	1315	1387	1306	1520	1241	1294	1283	1272
April 15	815	1205	1444	1369	1509	1241	1355	1194	1267
April 25	964	780	1405	1359	1626	1376	1383	1130	1253
May 5	752	725	1204	1190	1819	1011 1/	1319	1024	1131

1/ Planted over on May 14

All plots received 600 lbs. of 6-8-4 fertilizer per acre 1947-53. All plots were dusted to control insects as needed. 600# 8-8-8 applied in 1954.

CONCLUSIONS:

Planting in late March or April is preferable. In only 1 year of 8 has the early May planting produced the highest yield.

D. G. Sturkie

Table 37E Time of Planting Cotton - Alexandria Field

Date of Planting	Yield Per Acre						
	1949	1950	1951	1952	1953	1954	Average 1949-1954
April 5	1202	1060	1608	1134	1256	818	1180
April 15	1200	1090	1790	1086	1508	784	1243
April 25	1130	960	1478	1142	1650	740	1183
May 5	956	980	1104	1224	1576	690	1088
May 15	724	720	772	1194	1038	606	842
May 25	606	400	576	916	850	502	642

1949-50 600# 6-8-4
1951 600# 4-10-7 under and 200# soda side dressing
1952-53 500# 4-10-7 under and 150# soda side dressing
1954 600# 6-8-4 under and 20# N Side dressing

CONCLUSIONS:

Planting in April was desirable

D. G. Sturkie

Table 161Date of Planting Spanish and Runner Peanuts
Aliceville 1942

Date of Planting	Date of Harvest		Spanish		Runner	
	Spanish	Runner	Seed	Vines	Seed	Vines
April 20	Sept 9	Oct. 15	1949	1872	1822	2361
May 10	Sept 30	Oct. 15	2214	1493	1750	2242
May 30	Sept 30	Oct. 15	1957	1578	1474	1543

No Fertilizer used. Rows 3 feet apart. Shelled seed planted both Spanish and Runner peanuts with 2 12" peanut plates in duplex hopper.

CONCLUSIONS:

No very definite conclusions can be drawn from this test.

D. G. Sturkie

Table 162 Sugar Cane Variety and Time of Planting Test on the Browton Field 1950-1954

Plant Cane

Variety	When Planted	T/A	Gal./A	
C.P. 29/116		27.5	508	T/A 6 year Ave. (49-54) Gal. 4 year Ave. (50-53
C.P. 36/111		26.9	497	T/A 6 year Ave. (49-54) Gal. 4 year Ave. (50-53
C.P. 29/116A	Fall	27.8	538	T/A 6 year Ave. (49-54) Gal. 4 year Ave. (50-53
C.P. 29/116B	Spring	28.5	572	T/A 6 year Ave. (49-54) Gal. 4 year Ave. (50-53
C.P. 36/111A	Fall	26.9	550	T/A 3 year Ave. (52-54) Gal. 2 year Ave. (52-53
C.P. 36/111B	Spring	28.5	606	T/A 3 year Ave. (52-54) Gal. 2 year Ave. (52-53
C.O. 290A	Fall	30.8	440	T/A 3 year Ave. (49-51) Gal. 2 year Ave. (50-51
C.O. 290B	Spring	29.6	453	T/A 3 year Ave. (49-51) Gal. 2 year Ave. (50-51
C.O. 290		31.5	445	T/A 3 year Ave. (49-51) Gal. 2 year Ave. (50-51
C.P. 36/166		24.4	498	T/A 3 year Ave. (52-54) Gal. 2 year Ave. (52-53
C.P. 36/181		33.0	564	T/A 4 year Ave. (49-52) Gal. 3 year Ave. (50-52
C.P. 31/511		25.8	425	T/A 2 year Ave. (49-50) Gal. 1 year (1950)
C.P. 36/12		21.8	505	T/A 2 year Ave. (53-54) Gal. 1 year (1953)
First Year Stubble				
C.P. 29/116		28.9	519	Both are 5 year Ave. (50-54)
C.P. 36/111		31.9	559	Both are 5 year Ave. (50-54)
C.P. 29/116A	Fall	27.8	567	T/A 5 year Ave. (50-54) Gal. 4 year Ave. (50-53
C.P. 29/116B	Spring	32.5	668	T/A 5 year Ave. (50-54) Gal. 4 year Ave. (50-53
C.P. 36/111A	Fall	35.0	921	T/A 2 year Ave. (53-54) Gal. 1 year (1953)
C.P. 36/111B	Spring	35.0	989	T/A 2 year Ave. (53-54) Gal. 1 year (1953)
C.O. 290A	Fall	19.6	339	T/A 3 year Ave. (50-52) Gal. 3 year Ave. (50-52)
C.O. 290B	Spring	14.2	256	T/A 3 year Ave. (50-52) Gal. 3 year Ave. (50-52)
C.O. 290		19.8	363	T/A 3 year Ave. (50-52) Gal. 3 year Ave. (50-52)
C.P. 36/166		32.0	594	T/A and Gal. 2 year Ave. (1953-54)
C.P. 36/181		29.0	598	T/A 4 year Ave. (50-53) Gal. 4 year (50-53)
C.P. 31/511		16.7	343	Both are 2 year ave. (50-51)
C.P. 36/12		20.0	410	Both are 1 year only
Second Year Stubble				
C.P. 29/116		27.9	584	T/A 4 year Ave. (51-54) Gal. 3 year (51-53)
C.P. 36/111		29.8	648	T/A 4 year Ave. (51-54) Gal. 3 year (51-53)
C.P. 29/116A	Fall	25.0	527	T/A 4 year Ave. (51-54) Gal. 3 year (51-53)
C.P. 29/116B	Spring	28.8	622	T/A 4 year Ave. (51-54) Gal. 3 year (51-53)
C.O. 290A	Fall	12.9	250	Both are 3 year Ave. (51-53)
C.O. 290B	Spring	11.0	208	Both are 3 year Ave. (51-53)
C.P. 36/111A	Fall	16.2		1 year only
C.P. 36/111B	Spring	18.1		1 year only
C.O. 290		14.7	279	Both are 3 year Ave. (51-53)
C.P. 36/166		21.2		1 year only
C.P. 36/181		23.2	487	T/A 4 year Ave. (51-54) Gal 3 year (51-53)
C.P. 31/511		8.7	14.5	Both are two year Ave. (51-52)

Cane Variety Test 1931-48

C.P. 807	23.1	Ave. 1933-48
C.O. 290	28.4	Ave. 1935-48
C.O. 281	16.7	Ave. 1933-46
P.O.J. 234	14.7	Ave. 1931-46
Cayanna	18.0	Ave. 1931-46
C.P. 29/116	24.6	Ave. 1938-48
C.P. 28/19	17.8	Ave. 1937-46
C.P. 28/11	17.2	Ave. 1937-46
P.O.J. 213	16.6	Ave. 1931-35
P.O.J. 36M	14.0	Ave. 1931-35

Summary

New varieties C.P. 29/116 and C.P. 36/111are superior to the old varieties, especially in the yield from stubble cane.

There is little difference in yield from fall and spring planted cane. Yields from spring planted cane were slightly greater in most cases, but fall planting is much more convenient.

This test was revised in 1955 to include a depth of planting study in place of the time of planting variable.

Table 163 Oat Date of Planting-Method of Utilization-Variety Experiment
Lower Coastal Plain
Average grain yield of bushels per acre during 3-year period, 1953-1955

Variety	Date	Utilization	1955	1954	1953	Average
Nortex 107	Aug. 20	Clipped	40.4	38.3	48.4	42.4
Nortex 107	Aug. 20	Unclipped	37.9	27.6	41.2	35.6
Nortex 107	Sept. 10	Clipped	39.6	37.9	49.0	42.2
Nortex 107	Sept. 10	Unclipped	35.7	65.1	40.4	47.1
Nortex 107	Sept. 30	Clipped	26.8	38.7	46.8	37.4
Nortex 107	Sept. 30	Unclipped	32.8	56.2	60.0	49.7
Nortex 107	Oct. 20	Clipped	39.6	55.3	30.6	41.8
Nortex 107	Oct. 20	Unclipped	38.3	70.6	33.6	47.5
Nortex 107	Nov. 10	Clipped	40.0	40.8	17.8	32.9
Nortex 107	Nov. 10	Unclipped	31.1	63.0	30.4	41.5
Victorgrain 48-93	Aug. 20	Clipped	35.8	16.2	36.6	29.5
Victorgrain 48-93	Aug. 20	Unclipped	30.2	25.1	44.2	33.2
Victorgrain 48-93	Sept. 10	Clipped	40.0	32.8	45.8	39.5
Victorgrain 48-93	Sept. 10	Unclipped	30.7	37.0	65.0	44.2
Victorgrain 48-93	Sept. 30	Clipped	29.4	44.2	48.2	40.6
Victorgrain 48-93	Sept. 30	Unclipped	27.7	65.1	58.2	50.3
Victorgrain 48-93	Oct. 20	Clipped	31.1	47.2	38.8	39.0
Victorgrain 48-93	Oct. 20	Unclipped	33.6	56.2	47.8	45.9
Victorgrain 48-93	Nov. 10	Clipped	32.4	54.5	33.7	40.2
Victorgrain 48-93	Nov. 10	Unclipped	24.7	57.4	47.2	43.1

Table 164 Average yield of dry forage in lbs. per acre during 3-year period, 1953-1955

Variety	Date	1955	1954	1953	Average
Nortex 107	Aug. 20	442	692	1582	905
Nortex 107	Sept. 10	199	1491	1519	1070
Nortex 107	Sept. 30	762	1561	2150	1476
Nortex 107	Oct. 20	1688	2014	1178	1627
Nortex 107	Nov. 10	321	110	710	380
Victorgrain 48-93	Aug. 20	1035	611	2297	1314
Victorgrain 48-93	Sept. 10	1001	596	2537	1378
Victorgrain 48-93	Sept. 30	1895	1550	2578	2008
Victorgrain 48-93	Oct. 20	1975	2576	1104	1752
Victorgrain 48-93	Nov. 10	810	248	1170	743

SUMMARY

Best forage yields from oats at the Lower C. P. Substation have been obtained from the September 30 and October 20 planting dates during the 3-year period 1953-55. Grain yields during the period were similar for all planting dates except that August 20th appears to be too early to plant Victorgrain 48-93 at this location.

L. J. Chapman

Table 165 Oat Date of Planting-Method of Utilization-Variety Experiment
Upper Coastal Plain
Average grain yield in Bushels per acre during 4-year period, 1952-1955

Variety	Date	Utilization	1955	1954 1/	1953	1952	Avg.
Nortex 107	Aug. 20	Clipped	51.4		51.4	60.3	54.4
Nortex 107	Aug. 20	Unclipped	52.9		40.5	76.5	56.6
Nortex 107	Sept. 10	Clipped	57.1		47.2	52.5	52.3
Nortex 107	Sept. 10	Unclipped	58.6		64.2	52.8	58.5
Nortex 107	Sept. 30	Clipped	64.2		45.2	86.4	65.3
Nortex 107	Sept. 30	Unclipped	57.8		43.3	91.6	64.2
Nortex 107	Oct. 20	Clipped	55.1		71.9	86.1	71.0
Nortex 107	Oct. 20	Unclipped	55.2		62.0	86.6	67.9
Victorgrain 48-93	Aug. 20	Clipped	36.6		70.6	53.8	53.7
Victorgrain 48-93	Aug. 20	Unclipped	33.3		74.6	97.9	68.6
Victorgrain 48-93	Sept. 10	Clipped	62.0		82.8	49.6	64.8
Victorgrain 48-93	Sept. 10	Unclipped	50.2		62.3	68.1	60.2
Victorgrain 48-93	Sept. 30	Clipped	55.6		77.3	101.5	78.1
Victorgrain 48-93	Sept. 30	Unclipped	51.4		75.0	117.4	81.2
Victorgrain 48-93	Oct. 20	Clipped	57.0		66.4	105.0	76.1
Victorgrain 48-93	Oct. 20	Unclipped	58.2		69.4	93.4	73.7

1/ Grain yield not determined in 1954 because of severe lodging.

Table 166 Average yield of dry forage in lbs. per acre during 4-year period 1952 - 1955

Variety	Date	1955	1954	1953	1952	Average
Nortex 107	Aug. 20	55	238	769	1724	709
Nortex 107	Sept. 10	174	342	718	1603	709
Nortex 107	Sept. 30	368	426	616	1364	694
Nortex 107	Oct. 20	83	228	110	617	260
Victorgrain 48-93	Aug. 20	77	208	994	2504	946
Victorgrain 48-93	Sept. 10	428	426	1402	2323	1145
Victorgrain 48-93	Sept. 30	532	444	926	2190	1025
Victorgrain 48-93	Oct. 20	215	251	301	969	434

SUMMARY

Little if any differences in forage yield of oats have been obtained at the Upper Coastal Plain Substation when planted not later than September 30. The average forage yield during the period is extremely low and most likely is a reflection of the dry weather during the fall and winter. This probably accounts for the lack of response to date of planting in forage yields.

Best grain yields were obtained from Sept. 30 and Oct 20 planting dates.

I. J. Chapman

Table 167 Oat Date of Planting-Method of Utilization-Variety Experiment
Tennessee Valley
Average grain yield in bushels per acre during 4-year period, 1952-55

Variety	Date	Utilization	1955	1954	1953	1952	Average
Nortex 107	Aug. 20	Clipped	33.2	38.3	74.8	74.1	55.1
Nortex 107	Aug. 20	Unclipped	51.0	28.1	86.0	72.7	59.4
Nortex 107	Sept. 10	Clipped	31.1	46.4	65.9	80.6	56.0
Nortex 107	Sept. 10	Unclipped	33.2	39.6	72.8	69.1	53.7
Nortex 107	Sept. 30	Clipped	29.1	44.7	65.2	48.8	46.9
Nortex 107	Sept. 30	Unclipped	32.4	40.5	82.4	46.2	50.4
Nortex 107	Oct. 20	Clipped	51.0	48.1	62.4	45.2	51.7
Nortex 107	Oct. 20	Unclipped	49.8	44.7	84.7	31.9	52.8
Victorgrain 48-93	Aug. 20	Clipped	44.7	25.6	82.0	74.1	56.6
Victorgrain 48-93	Aug.20	Unclipped	35.8	33.7	76.4	86.5	58.1
Victorgrain 48-93	Sept. 10	Clipped	24.7	40.8	60.5	91.6	54.4
Victorgrain 48-93	Sept. 10	Unclipped	22.6	21.3	69.6	102.2	53.9
Victorgrain 48-93	Sept. 30	Clipped	26.0	22.6	76.7	98.9	56.0
Victorgrain 48-93	Sept. 30	Unclipped	21.3	46.4	101.2	83.6	63.1
Victorgrain 48-93	Oct. 20	Clipped	42.1	66.0	98.4	80.7	71.8
Victorgrain 48-93	Oct. 20	Unclipped	43.9	65.1	77.8	27.2	53.5

Table 168 Average yield of dry forage in lbs. per acre during 4-year period, 1952-55

Variety	Date	1955	1954	1953	1952	Average
Nortex 107	Aug. 20	0	1614	1664	1022	1075
Nortex 107	Sept. 10	130	2804	1631	1603	1542
Nortex 107	Sept. 30	178	1461	937	343	730
Nortex 107	Oct. 20	0	0	110	0	28
Victorgrain 48-93	Aug. 20	39	2453	3431	654	1644
Victorgrain 48-93	Sept. 10	295	2088	2461	2280	1781
Victorgrain 48-93	Sept. 30	273	1623	1354	682	983
Victorgrain 48-93	Oct. 20	39	0	360	166	141

SUMMARY

During the 4-year period 1952-55 the best date from grain and forage yield standpoint, for planting oats on the Tennessee Valley Substation has been Sept. 10.

L. J. Chapman

Table 169 Oat Date of Planting-Method of Utilization-Variety Experiment
Gulf Coast
Average grain yield in bushels per acre during 3-year period, 1953-55

Variety	Date	Treatment	1955	1954	1953 1/	Average
Nortex 107	Sept. 10	Clipped	17.9	3.0		10.5
Nortex 107	Sept. 10	Unclipped	22.6	16.2		19.4
Nortex 107	Sept. 30	Clipped	45.1	2.2		23.7
Nortex 107	Sept. 30	Unclipped	35.7	5.1		20.4
Nortex 107	Oct. 20	Clipped	35.3	8.1		21.7
Nortex 107	Oct. 20	Unclipped	23.8	23.0		23.4
Nortex 107	Nov. 10	Clipped	39.6	6.4		23.0
Nortex 107	Nov. 10	Unclipped	15.8	10.6		13.2
Victorgrain 48-93	Sept. 10	Clipped	4.7	1.8		3.3
Victorgrain 48-93	Sept. 10	Unclipped	5.1	33.6		19.4
Victorgrain 48-93	Sept. 30	Clipped	6.8	2.6		4.7
Victorgrain 48-93	Sept. 30	Unclipped	23.0	28.0		25.5
Victorgrain 48-93	Oct. 20	Clipped	13.2	3.0		8.1
Victorgrain 48-93	Oct. 20	Unclipped	28.6	19.9		24.3
Victorgrain 48-93	Nov. 10	Clipped	11.1	1.8		6.5
Victorgrain 48-93	Nov. 10	Unclipped	31.1	17.0		24.1

1/ Grain not harvested because of bird damage

Table 170 Average yield of dry forage in lbs. per acre during 3-year period 1953-55

Variety	Date	1955	1954	1953	Average
Nortex 107	Sept. 10	4311	3253	3234	3599
Nortex 107	Sept. 30	3822	2643	3908	3458
Nortex 107	Oct. 20	3839	2457	4188	3595
Nortex 107	Nov. 10	1995	2238	3355	2529
Victorgrain 48-93	Sept. 10	4299	3268	3437	3668
Victorgrain 48-93	Sept. 30	5478	2642	4980	4367
Victorgrain 48-93	Oct. 20	3612	2846	4201	3553
Victorgrain 48-93	Nov. 10	2911	2303	3382	2865

SUMMARY

No differences in forage yield of Nortex 107 oats have been obtained at the Gulf Coast Substation when planted Sept 10, Sept. 30 or Oct. 20. The best forage yields from Victorgrain 48-93 oats were obtained from the September 30 planting dates.

The lower grain yields from clipped plots as compared to unclipped indicates that oats should probably not be grazed later than February 15 in southern Alabama if satisfactory grain yields are to be expected.

L. J. Chapman

Table 171 Oat Date of Planting-Method of Utilization-Variety Experiment
AUBURN
Average grain yield in bus. per acre during 4-year period
1952 - 1955

Variety	Date	Utilization	1955	1954	1953	1952	Average
Nortex 107	Aug. 20	Clipped	16.3	28.3	27.3	1/	24.0
Nortex 107	Aug. 20	Unclipped	7.2	19.6	35.3	1/	20.7
Nortex 107	Sept. 10	Clipped	15.9	32.8	26.9	76.1	37.9
Nortex 107	Sept. 10	Unclipped	14.8	20.7	44.7	51.6	33.0
Nortex 107	Sept. 30	Clipped	20.0	42.3	47.9	51.3	40.4
Nortex 107	Sept. 30	Unclipped	12.9	31.7	47.2	63.6	38.9
Nortex 107	Oct. 20	Clipped	14.8	44.7	44.8	67.7	43.0
Nortex 107	Oct. 20	Unclipped	12.5	43.0	46.3	53.4	38.8
Nortex 107	Nov. 10	Clipped	18.2	42.6	37.6	52.7	37.8
Nortex 107	Nov. 10	Unclipped	9.8	26.6	36.6	51.6	31.2
Victorgrain 48-93	Aug. 20	Clipped	16.6	9.4	63.6	1/	29.9
Victorgrain 48-93	Aug. 20	Unclipped	16.3	11.8	58.4	1/	28.8
Victorgrain 48-93	Sept. 10	Clipped	29.5	23.4	64.5	53.5	42.7
Victorgrain 48-93	Sept. 10	Unclipped	11.3	20.3	59.6	50.8	35.5
Victorgrain 48-93	Sept. 30	Clipped	8.3	41.6	61.3	50.7	40.5
Victorgrain 48-93	Sept. 30	Unclipped	8.0	32.4	89.4	72.9	50.7
Victorgrain 48-93	Oct. 20	Clipped	12.5	41.8	87.5	44.4	46.6
Victorgrain 48-93	Oct. 20	Unclipped	12.5	38.8	90.3	100.6	60.6
Victorgrain 48-93	Nov. 10	Clipped	18.9	32.4	58.8	55.5	41.4
Victorgrain 48-93	Nov. 10	Unclipped	17.0	31.5	43.6	65.7	39.5

1/ Oats not planted this date.

Table 172 Average yield of dry forage in lbs. per acre during 4-year period 1952-55

Variety	Date	1955	1954	1953	1952	Avg.
Nortex 107	Aug. 20	1272	702	3034	---	1699
Nortex 107	Sept. 10	944	257	2239	1963	1226
Nortex 107	Sept. 30	1038	926	1165	955	946
Nortex 107	Oct. 20	565	181	666	633	511
Nortex 107	Nov. 10	302	70	122	214	177
Victorgrain 48-93	Aug. 20	792	732	3070	---	1531
Victorgrain 48-93	Sept. 10	756	418	3664	1825	1666
Victorgrain 48-93	Sept. 30	1474	1288	1742	1031	1384
Victorgrain 48-93	Oct. 20	1010	418	436	1398	816
Victorgrain 48-93	Nov. 10	636	223	338	578	444

SUMMARY

Best forage yields of Nortex 107 oats have been obtained from the Aug. 20 and Sept. 10 dates of planting at Auburn.

Best yields of Victorgrain 48-93 were obtained from Aug. 20, Sept. 10, and Sept. 30 planting dates.

Best grain yields were obtained from Sept. 30 and Oct. 20 planting dates.

L. J. Chapman

Table 173 Oat Date of Planting-Method of Utilization-Variety Experiment
Piedmont
Average grain yield in bus. per acre during 4-year
period 1952-1955

Variety	Date	Utilization	1955	1954	1953	1952	Average
Nortex 107	Aug. 20	Clipped	30.6	75.6	41.3	---1/	49.2
Nortex 107	Aug. 20	Unclipped	46.0	48.4	48.4	---1/	47.6
Nortex 107	Sept. 10	Clipped	26.8	62.8	35.4	60.9	46.5
Nortex 107	Sept. 10	Unclipped	37.0	32.2	43.0	47.2	39.9
Nortex 107	Sept. 30	Clipped	25.1	83.2	33.6	33.5	57.6
Nortex 107	Sept. 30	Unclipped	30.7	55.6	38.2	58.1	45.7
Nortex 107	Oct. 20	Clipped	40.9	66.9	63.9	73.6	61.3
Nortex 107	Oct. 20	Unclipped	31.1	73.0	56.2	51.5	53.0
Nortex 107	Nov. 10	Clipped	25.5	75.2	74.6	63.3	59.7
Nortex 107	Nov. 10	Unclipped	34.9	91.4	40.2	42.2	52.2
Victorgrain 48-93	Aug. 20	Clipped	34.5	93.8	85.4	---1/	71.2
Victorgrain 48-93	Aug. 20	Unclipped	38.7	77.8	78.7	---1/	65.1
Victorgrain 48-93	Sept. 10	Clipped	32.8	70.7	86.8	43.5	63.4
Victorgrain 48-93	Sept. 10	Unclipped	32.4	62.0	56.1	37.0	50.2
Victorgrain 48-93	Sept. 30	Clipped	32.1	68.8	71.0	81.7	54.0
Victorgrain 48-93	Sept. 30	Unclipped	39.2	76.0	55.7	60.7	57.0
Victorgrain 48-93	Oct. 20	Clipped	30.7	74.1	50.5	71.8	51.8
Victorgrain 48-93	Oct. 20	Unclipped	34.9	94.9	63.3	57.2	64.4
Victorgrain 48-93	Nov. 10	Clipped	28.5	64.6	71.2	51.6	54.8
Victorgrain 48-93	Nov. 10	Unclipped	31.9	95.6	46.8	52.7	58.1

1/ Oats not planted this date.

Table 174 Average yield of dry forage in lbs. per acre during 4-year
period 1952-55

Variety	Date	1955	1954	1953	1952	Average
Nortex 107	Aug. 20	108	1644	2455	---	1402
Nortex 107	Sept. 10	113	2523	3139	885	1665
Nortex 107	Sept. 30	34	1379	2488	370	1068
Nortex 107	Oct. 20	210	329	519	299	339
Nortex 107	Nov. 10	82	269	112	66	132
Victorgrain 48-93	Aug. 20	324	1711	2437	---	1491
Victorgrain 48-93	Sept. 10	174	2314	3176	928	1648
Victorgrain 48-93	Sept. 30	175	1774	3177	538	1416
Victorgrain 48-93	Oct. 20	244	575	775	507	525
Victorgrain 48-93	Nov. 10	256	438	202	221	279

SUMMARY

Best forage yields of Victorgrain 48-93 and Nortex 107 oats have been obtained from September 10 plantings during 4-year period at the Piedmont Substation. August 20 was the next best date for planting Nortex 107 while both August 20 and Sept. 30 dates on Victorgrain 48-93 both gave almost as good as September 10 dates.

Grain yields were similar for all dates tested.

L. J. Chapman

Table 175. Experiment: Width of Row and Spacing of Corn at Tennessee Valley Sand Mountain, Auburn and Brewton

Place	Year	Variety and Spacing — Yield of corn in bushels per acre 1/		
		Late Variety 18" spacing on all rows	Late Variety 12" spacing on 2 rows no corn on 3rd row	Late Variety 12" spacing on 2 rows Early variety 12" spacing on 3rd row
Tennessee V.	1951	47.2	38.3	51.6
	1952	1.6	1.0	1.4
	1953	48.3	39.8	46.2
	1954	4.8	5.0	1.5
	1955	82.0	68.8	81.1
Avg. all years		36.8	30.6	36.4
Sand Mountain	1951	59.7	56.7	64.1
	1952	No records for this year		
	1953	49.4	39.2	49.2
	1954	32.2	25.0	31.2
	1955	69.7	50.2	68.7
4 year Avg.	1951-1955	52.8	43.0	53.3
Brewton	1952	47.3	45.9	41.1
	1953	Not grown in this year		
	1954	45.1	53.9	46.8
	1955	78.6	89.4	84.7
3 year Avg.	1952-1955	57.0	63.1	57.5
Auburn	1949	62.8	52.7	68.5
	1950	49.4	33.5	45.3
	1951	46.9	43.7	53.7
3 year Avg.	1949-1951	53.0	43.3	55.8
Avg. all locations 15 years		48.3	42.9	49.0

1/ The yield per acre is calculated on the basis of the entire area involved. The space for the blank row on row 3 in one of the methods is not deducted.

CONCLUSIONS:

Planting corn thicker on 2 rows and leaving the 3rd row blank did not give as high a yield as planting the same number of stalks distributed over the 3 rows. Planting 2 rows thick with a late variety and then planting an early variety on 3rd row did not produce any higher yield than planting all 3 rows to the late variety and spacing it thinner.

D. G. Sturkie

Table 176 Spacing Test - Corn

Sand Mountain, 1932 and 1933

Width Rows	Distance between Stalks	Bushels per Acre 1932	1933	Av. 1932-33
3.5 ft.	18 inches	49.1	38.3	43.7
3.5 ft.	24 inches	47.3	38.6	43.0
3.5 ft.	30 inches	48.3	36.7	42.5
3.5 ft.	36 inches	46.3	35.1	40.7

Variety: Thompson's Polific

Fertilizer: 36 Lbs. Nitrogen

Conclusion: At the 36 pound level of nitrogen there is no difference in yield of corn at 18, 24, 30 and 36 inch drill spacing with the same row width.

Table 177 Row Spacing of Corn Experiment

Wiregrass Substation - Tier 37

1932 - 1940 1/

Treatment No.	Spacing Row	Spacing Drill	Yield of corn per acre 1932	1934	1935	1936	1937	1938	1939	1940	Average 1932-40
	ft.	ft.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.
1	3	3	26.0	39.4	30.0	43.3	40.3	26.7	38.4	40.9	35.9
2	4-1/2	2	29.4	42.8	33.5	36.1	34.7	28.2	30.7	42.2	34.6
3	6	1-1/2	29.7	41.9	31.8	36.5	32.0	29.9	30.6	45.7	34.5

1/ No records made in 1933. Test destroyed by worms.

(a) No fertilizer applied 1932-36. All plots received 600 # of 6-0-0 for remaining years.

(b) Conclusion: With a constant number of stalks per acre and only 36 pounds of nitrogen, row spacing had no effect on corn yields.

F. S. McCain

Table 178 Number of Cultivations of Cotton
Wiregrass Substation 1931-40

No. Cult:	Seed Cotton - Pounds per acre									10 Yr.
	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	Avg.
3	996	930	869	1176	1266	1464	1902	1494	786	1404	1229
6	1140	642	864	1392	1602	1548	1890	1482	738	1212	1251
9	1140	822	914	1290	1428	1536	2160	1524	480	888	1218

Fertilization: 600# per acre of 6-10-4, N from $NaNO_3$.

CONCLUSIONS:

The Number of cultivations of 3 or more made a very little difference in the yield. More and later cultivations resulted in less grass and weeds in the cotton at harvest time. This for convenience in picking, late cultivation is desirable.

Table 179 Row Spacing of Cotton Experiment, Wiregrass Substation

1933-40

Row Width	Seed Cotton - Pounds Per Acre								
	1933	1934	1935	1936	1937	1938	1939	1940	8 Yr. Avg
3.0'	1042	1447	1615	1612	1996	1525	665	1256	1395
4.5'	1175	1200	1356	1422	1934	1319	655	1260	1290
6.0'	929	1183	1372	1304	1766	1227	913	1179	1234

The same number of plants per acre (16,000 stalks)

Fertilization: 600# of 6-10-4, N from $NaNO_3$

CONCLUSIONS:

The largest yield was made in a 3.0' row. Increasing the width up to 6' reduced the yield of approximately 11% (160 lbs.)

D. G. Sturkie

Table 180 The Yield of Runner and Spanish Peanuts in a Spacing Test at Alexandria Field 1939-40

Variety	Spacing	Nuts Pounds/Acre: 1939	1940	Avg.	Hay Pounds/Acre: 1939	1940	Avg.
Runner	12" X 42"	701	368	534	2207	943	1575
Runner	12" X 28"	728	490	609	2145	1431	1788
Spanish	12" X 28"	748	380	564	1025	721	873
Spanish	6" X 28"	808			1310		

Peanuts were planted on Decatur clay soil. Superphosphate at the rate of 200# per acre was applied in the drill before planting.

CONCLUSIONS:

No definite conclusions can be drawn from the test. In general thick spacing produced higher yields of nuts.

D. G. Sturkie

Table 181 DATE OF PLANTING RUNNER PEANUTS

Prattville-1939-46

Date of Planting	8 year average-1939-46 Yield-Pounds Per Acre
April 5	1570
April 15	1417
April 25	1498
May 6	1346
May 17	1260
May 25	1166 1/
June 5	1051 1/
June 15	742 1/

1/ 7 year average, 1940-46.

No fertilizer applied any year except some phosphate in 1944.

SUMMARY: Peanuts planted in early April at Prattville gave the highest yields. Late May and early June plantings gave considerably reduced yields.

Fred Adams

Table 182 SPACING TEST WITH RUNNER PEANUTS

Wiregrass Substation

1950 and 1953-54

Hill Spacing in in.	Row Width and Yield of Dry Peanuts in Pounds Per Acre											
	30 inch rows				36 inch rows				42 inch rows			
	1950	1953	1954	Ave	1950	1953	1954	Ave	1950	1953	1954	Ave.
3"		1033	1439	1236		1238	1248	1243		1014	870	942
6"	2157	1063	1498	1572	2068	1110	1117	1431	1574	1039	1031	1215
9"	2078	1000	1417	1498	1895	992	1106	1331	1590	811	1091	1164
12"	1876	788	1580	1414	1925	803	1147	1292	1644	819	1021	1161
15"	1728				1992				1498			

4 Replications

Variety-Dixie Runner

Fertilizer - 375# of 9-12-20 Broadcast in 1953
1000# of Basic Slag and 150# Muriate of Potash in 1954

SUMMARY: Although the results appeared to be somewhat erratic, the 30-inch rows with spacings between plants of 6 to 9 inches appeared best. The 42-inch rows appeared to be too wide.

Fred Adams

An experiment with volunteer crotalaria in corn with different row spacing and time of last cultivation at Alexandria Field.

The object of this experiment is to determine the yields of corn that may be produced in combination with crotalaria where no commercial nitrogen is supplied to corn and also where nitrate of soda is applied. The dates of last cultivation for different plots are about June 1, June 15, and July 1, respectively.

Corn has been grown on this area for five years. No fertilizer was applied for the first three years, but in 1938 one plot received 225#/A of nitrate of soda. In 1939, each 1/20 acre plot was divided and the south half received 225 pounds of nitrate of soda as a side-dressing. In 1940, a uniform application of super phosphate and muriate of potash at the rate of 800 pounds and 100 pounds per acre respectively was made on March 15.

In 1939 the corn rows on all plots were 3.5 foot apart. In 1940 the rows of plots 1, 2, and 3 were spaced 7 feet apart while plot 4 had 3.5 foot row spacing. The same number of stalks per acre are maintained for both row spacings.

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Table 192:
Effect of Time of Cutting and Fertilizers on Sericea Hay and Seed Yields
Brewton Averages 1933-35 (a)

Cutting Treatment	Fertilizer and Lime Treatment (d) (1) None	(2) None	P	PK	PKL	Mean
Two early cuttings	2591	3049	3356	4914	5338	3851
Often as ready (b)	1945	2251	2972	4003	4649	3163
Two late cuttings (c)	4687	4040	3658	6061	5107	4712
Mean	3074	3112	3331	4994	5032	

(a) Established 3/15/30. Plot size 6 X 20 ft. (3 rows 20 ft. long. Rows 2 feet apart.) Area harvested = 1/1146.30 acre. Little or no seed produced on any plot.

(b) Cut twice in 1933, 1934, and 1935; three times in 1932.

(c) Second cutting in September or October.

(d) Fertilizer and lime treatments:

P = 400# super per acre in 1930 and 1933.
K = 50# muriate per acre in 1930 and 1933.
L = 4000# ground oyster shells per acre in 1930 only.

Summary and remarks:

Two late cuttings averaged yielding more than two early cuttings. There was very little response to P, if any.

There appears to have been a response to PK over P and no fertilizer. There was no difference in yield on the PK and PKL plots

E. D. Donnelly

Table 191:
Effect of Time of Cutting and Fertilizers on Sericea Hay and Seed Yields
Monroeville Averages, 1933-35[a]

Cutting Treatment	Fertilizer and Lime Treatment[d] (1) None	(2) None	P	PK	PKL	Mean
Two early cuttings	2218	2896	3555	7063	9305	5005
Often as ready[b]	2413	2763	2839	5200	5162	3674
Two late cuttings[c]	3901	4086	4285	6802	7911	5399
Mean	2844	3247	3560	6356	7461	

(a) Seeded 3/17/30. Plot size 9' X 20' (3 rows plots 20 feet long. Rows three feet apart.) Area harvested 1/1146.30 acre. Little or no seed produced on any plot.

(b) Cut twice in 1934 and 1935, three times in 1933.

(c) Second cutting in September or October.

(d) Fertilizer and lime treatments:

P = 400# super per acre in 1930 and 1933.
K = 50# muriate in 1930 and 1933.
L = 4000# ground oyster shells per acre in 1930 only.

Summary and remarks:

Test not replicated and the way it was laid out, it appears probable that there was a fertility gradient involved, as the first two plots had no fertilizer and the second one averaged yielding consistently more than the first. There was about as much difference between the P and the second no fertilizer plot as between plots (1) and (2).

There appears to have been a response to PK over P and to PKL over PK. There was no K alone plot.

Table 190 Effect of Rate of Seeding Sericea on Yield of Hay and Seed.[a]
Brewton, 1933-35

Rate of Seeding per Acre in Pounds[b]	Pounds per acre[c] Hay[d] 1933	1934	1935	Ave.	Seed[e] 1933	1934	1935	Ave.
25.0	1086	2515	2057	1886	297	413	596	435
37.5	1503	4351	2785	2880	345	461	867	558
50.0	1725	4698	3025	3149	399	534	1048	660

(a) Established 2/16/32.

(b) Broadcast, clean, unhulled seed.

(c) Averages, two replications (plots 10 X 20 ft.)

(d) Cut once and then for seed.

(e) Clean, unhulled.

SUMMARY AND REMARKS:

1. As rate of seeding was increased from 25.0 to 37.5 to 50.0 pounds of unhulled seed per acre, the hay and seed yields also increased.

2. There was still a good stand in 1936 on plots seeded at the 50.0 pound rate, fair stands at the 37.5 pound rate and poor stands on the plots there were seeded at the 25.0 pound rate.

E. D. Donnelly

Table 189 Effects of Number of Cuttings and Time of Cutting Sericea Lespedeza on Forage and Seed Yields.
Prattville Experiment Field1/ (1934-40)

Plot No.	Cutting Treatment	Hay Yield (c) 1934	Hay Yield (c) 1940	7-yr. Ave. Yield 1934-1940 Hay (c)	7-yr. Ave. Yield 1934-1940 Seed
1	Cut once when ready and then for seed(a)	1846	1319	1787	248
2	Cut twice when ready and then for seed	3903	2473	3047	118
3	Cut once June 10 and then for seed	4690	1628	3154	159
4	Cut three times when ready and then for seed	6208	1284(d)	3422	8
5	Cut every time when ready(b)	4959	1429(d)	3353	0
6	Cut June 10 and August 10 and for seed	4439	1686(d)	3410	10

1/ Sericea planted 4/25/33 in 30 inch rows at the rate of 12 lbs./A. Plot size 1/33.5 A.
(a) "When ready" as used in test was when sericea was 15-18 inches high.
(b) Cut 3 times 3 years and 4 times 4 years (4th. cutting in Nov.)
(c) Corrected for weeds according to percentage weeds estimates given along with data.
(d) Stands on plots 4, 5, and 6 began to thin in 1938. Stands on these plots were very thin by 1940. The experiment discontinued in 1940.

Summary:

1. Cutting once for hay and then for seed gave a fair hay yield and the highest seed yield.
2. Cutting twice when ready and then for seed gave a relatively good hay yield, a fair seed yield and did not thin the stand.
3. Cutting more than twice a year for hay or cutting twice for hay late in the season (June and August) Produced practically no seed and reduced stands.
4. Weed estimates were low, since 1940 yields on plots 4,5 and 6 were not as low as would be expected according to footnote (d).

E.D. Donnelly

Table 183 The yields of corn and crotalaria in row spacing and time of last cultivation of corn experiment at Alexandria Field 1939 - 45.

Row Spacing	Date last Cult.	Bu. Corn per acre — No nitrate to corn: 1939	1940	1941	1942	1943	1944	1945	Avg. 39-45	Bu. Corn per acre — 225# $NaNO_3$/A to corn.: 1939	1940	1941	1942	1943	1944	1945	Avg. 39-45
7'	6/1	16.9	4.0	26.5	40.0	22.8	19.6	14.8	20.7	23.7	13.6	38.6	47.2	22.4	17.0	12.4	25.0
7'	6/15	26.7	20.0	21.3	26.4	20.0	22.6	16.0	21.9	30.3	20.8	25.7	36.0	23.2	23.8	14.8	24.9
7'	7/1	26.7	20.0	24.6	24.0	25.6	19.8	17.6	22.6	28.3	25.6	32.4	32.8	24.8	22.6	22.4	27.0
3.5'	7/1	20.3	19.2	21.6	20.0	22.4	19.6	17.2	20.0	29.9	32.0	43.4	44.0	24.8	24.2	25.2	31.9

Row Spacing	Date Last Cult	Pounds Crotalaria per acre - Green wt. — No nitrate to corn: 1939	1940	1941	1942	1943	1944	1945	Avg. 39-45	Pounds Crotalaria per acre - Green wt. — 225# $NaNO_3$/A to corn: 1939	1940	1941	1942	1943	1944	1945	Avg 39-45
7'	6/1	2520	7380	8448	16700	10500	1650	failed	6743	1920	3420	6960	12300	6250	500	failed	4479
7'	6/15	2400	390	6432	11300	7000	1250		4110	1680	210	5356	10500	5000	1200		3421
7'	7/1	4080	600	2424	12000	2250	500		3122	2880	390	1224	8000	1250	800		2078
3.5'	7/1	3240	600	2112	10400	3750	200		2900	2760	420	768	5400	2500	200		1721

CONCLUSIONS: Laying by corn early was necessary to make a large yield of crotalaria. The width of row had little or no effect on the yield of crotalaria.

D. G. Sturkie

Table 184 Method of Cultivation of Cotton

Wiregrass Substation

1932-1940

Method of Cultivation:	Seed Cotton-Pounds Per Acre									9 yr. Avg.
	1932	1933	1934	1935	1936	1937	1938	1939	1940	
Plowed & hoed	834	909	1188	1494	1572 2/	2214	1650	726	1380	1330
Plowed	936	347	504	1122		2478 1/	1580 1/	660 1/	1392 1/	1121
Hoed only 3/	1038	927	1452	1476	1668	1698	1470	774	1200	1300

1/ Left all the cotton that came up but pulled the grass out.

2/ Due to error the "Plowed only" plot was also hoed in 1936; therefore, the figure given is an average of these two plots.

3/ The weeds were scraped off with a hoe over the row and middle.

Fertilization: 600# of 6-10-4, N from $NaNO_3$.

CONCLUSIONS:

There was very little difference in yield from plowing and hoeing as compared to keeping the weeds scraped off with hoe (no plowing). There was a reduction in yield when the cotton was plowed only (no hoing of weeds within the row) due to weeds in the row.

The main thing to do is to control the weeds the cheapest and easiest way possible.

Table 185 Time of Planting Cotton - Wiregrass

Substation 1931-1940

Date Planted:	Seed Cotton - Pounds Per Acre									9 year average
	1932	1933	1934	1935	1936	1937	1938	1939	1940	
March 20 1/ March 10	948	846	1224	1296	1560	1836	1356	600	1146	1201
April 5 1/ April 1	840	891	1146	1494	1596	1758	1368	888	1086	1230
April 20	894	743	1128	1062	1614	1914	1938	594	1140	1225

1/ The dates of planting were changed to March 20 and April 5 in 1938 due to the fact that March 10 was too early to hold a stand of cotton, so from replanting each year the experiment really had only two dates.

Fertilization: 600# per acre of 6-10-4, N from $NaNO_3$

CONCLUSIONS:

The dates of planting did not extend over a wide enough range to give conclusive results.

D. G. Sturkie

Table 186A Fodder Pulling Experiment. Sand Mt. 1937-42

PURPOSE:

This experiment was conducted to determine the effect of pulling fodder on the yield of corn and to determine roughly the quality of fodder pulled at different stages of maturity.

PROCEDURE:

The corn was planted by ordinary field methods and fertilized with 36 pounds of nitrogen 40 days after planting. The test consisted of nine plots of which Plots 1, 5, and 9 were checks. No fodder was pulled from these plots. Fodder was pulled on Plot 2 at the early roasting ear stage, one week later on Plot 3, two weeks later on Plot 4, three weeks later on Plot 6, four weeks later on Plot 7 and five weeks later on Plot 8.

RESULTS:

Table 186A Corn and Fodder Yields - Sand Mountain Substation
1937-42

Fodder Pulled	Plot No.	Corn or Fodder	1937 1/ 2/	1938 2/	1939	1940	1941	1942	Ave. 37-42
None-Check	1	C	50.9	43.9	30.8	44.0	44.6	42.9	42.8
		-	-	-	-	-	-	-	-
Early Roasting Ear	2	C	20.1	15.7	10.6	15.4	10.5	20.8	15.6
		F	675	801	660	762	845	857	767
One Week Later	3	C	35.1	27.6	17.8	26.5	18.1	29.5	25.8
		F	650	756	653	863	851	782	637
Two Weeks Later	4	C	41.9	36.6	22.6	38.3	26.5	38.0	34.0
		F	595	645	615	803	866	815	723
None - Check	5	C	51.2	47.8	33.6	51.5	47.6	51.6	47.2
		-	-	-	-	-	-	-	-
Three Weeks Later	6	C	45.6	39.7	28.4	45.2	35.6	42.2	39.5
		F	575	621	600	870	836	797	717
Four Weeks Later	7	C	42.6	41.9	21.2	46.6	35.1	42.1	38.3
		F	525	630	540	563	705	620	598
Five Weeks Later	8	C	43.7	39.8	24.4	50.0	40.3	47.1	40.9
		F	436	495	510	600	593	537	529
None - Check	9	C	41.8	39.4	25.7	50.4	44.6	45.0	41.2
		-	-	-	-	-	-	-	-
Avg. of all Checks									43.7

1/ Corn yields in bushels per acre and fodder yields in pounds per acre.

2/ About 70% of blades dead on Plot 7 and 95% dead on Plot 8 when fodder pulled. The best fodder came off Plot 2 and decreased in quality each week after this plot.

Table 186B Average Corn and Fodder Yields and Decrease in Corn Yields Due to Pulling Fodder - Sand Mt. Substation 1937-42

Fodder Pulled	Avg. Corn Yield 1937-42	Avg. Fodder Yield 1937-42	Loss Due to Pulling Fodder
	Bu.	Lbs.	Bu.
None - Avg. of all Checks	43.7	---	---
Early Roasting Ear Stage	15.6	767	28.1
One Week Later	25.8	631	17.9
Two Weeks Later	34.0	723	9.7
Three Weeks Later	39.5	717	4.2
Four Weeks Later	38.3	598	5.4
Five Weeks Later	40.9	529	2.8

CONCLUSIONS:

(1) Pulling fodder at or shortly after the early roasting ear stage seriously reduces the yield of corn.

(2) Pulling fodder four to five weeks after the early roasting ear stage does not seriously reduce yield of grain.

(3) Fodder quality is best when pulled in the early roasting ear stage. Quality decreases successively for each weeks' delay in pulling after this stage.

(4) Feed value gained by pulling fodder three or more weeks after the early roasting ear stage will not pay for the labor of pulling.

F. S. McCain

Table 187 The Yield of Runner and Spanish Peanuts on Various Soil types and the Effect of Inoculation on Yield Spanish and Runner Peanuts at Alexandria Field in 1941

Soil Type	Yield in Pounds per Acre			
	Spanish		Runner	
	Nuts	Hay	Nuts	Hay
Dewey gravelly loam	1385	2043	1745	3303
Dewey loam	1050	1840	1411	3358
Colbert silt loam	1358	1823	1697	2975
Colbert silt loam	1185	1815	944	2230
Decatur clay loam (eroded)	620	753	797	1676
Decatur clay loam	1990	1995	2068	4117
Average all plantings not inoculated	1208	1552	1378	2870
Average all plantings inoculated	1322	1691	1508	2970
Average inoculated and not inoculated	1265	1622	1443	2920

Runner and Spanish peanuts were planted at various locations and on various soils over Alexandria Field. One half of all plantings were planted with inoculated seed and one half with seed not inoculated. Due to inconsistent diffenences in yields of inoculated and uninoculated plantings at each location, an average yield is given for both combined.

All plots received 200# per acre of superphosphate.

CONCLUSIONS

There was an increase in yield from inoulation.

The more fertile areas produced the largest yields.

D. G. Sturkie

Table 188 PEANUT CULTIVATION EXPERIMENT

Wiregrass Substation 1939

Plot No.	Cultivation Practiced	Yield 1939 Only lb/A dry peanuts
1	Weeded, plowed, and hoed. No. grass	1021
2	Weeded, plowed, no hoe, light grass	834
3	Only plowed, heavy grass	579
4	Weeded, plowed, and hoed. No grass	1136

Footnotes - Treatments replicated three times. A/435.6 harvested. "The grass worms stripped the leaves from all peanuts in early September in 1939. This reduced all yields."

SUMMARY: Keeping all grass removed increased the yield of peanuts markedly.

Fred Adams

Table 193:
Effect of Row Width on Yield of Sericea Hay and Seed[a]. Brewton, 1933-35.

Row Width in inches[b]	Pounds per Acre[c]							
	Hay[d]				Seed			
	1933	1934	1935	Ave.	1933	1934	1935	Ave.
6	878	3307	2420	2202	201	511	866	526
12	3852	4931	2662	3815	583	467	726	592
18	4096	5163	2420	3893	678	387	484	516
24	3316	4119	2662	3366	498	281	484	421

(a) Established 2/16/32 at the rate of 37.5 pounds of clean, unhulled seed per acre.

(b) All plots except the 6 in. rows cultivated in 1932.

(c) Plots 10 X 20 ft.

(d) Cut once for hay, then for seed.

Summary:

(1) The 6 and 24 inch spacing yielded less forage than the 12 and 18 inch spacings; the 6 inch yielded less than the others.

(2) The 24 inch row width yielded less seed than the 6, 12 and 18 inch. There appeared to be little or no difference in the three latter.

(3) The lack of cultivation in 1932 of the 6 inch row width appears to be reflected in the forage and seed yields on this plot in 1933. (The other plots were cultivated in 1932.)

E. D. Donnelly

Table 194 Effect of Time and Frequency of Cutting on Yields of Kudzu Hay at Monroeville Field [1] 1933-1942

Plot	Treatment	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	10 Yr. Average
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	Cut once when ready	2805	6720	6450	4845	4095	5055	3420	3870	5025	4980	4726
2	Cut twice when ready	7106	8565	5213	7755	5835	4482	5241	1860 [4]	1980 [4]	3276 [4]	5131
3	Cut three times (Last time just before frost)	8980	8970	7485	7380	6717	2595	[3]	[3]	4815 [4]	4860	5180
4	Cut three times when ready	8895	7725	6701	5633	5182	2384	[3]	[3]	5910 [4]	4665	4710
5	Cut twice. Early and just before frost.	[2]	[2]	6225	6435	6750	6621	5625	6330	4934	5595	6064 [5]

1/ Data obtained 1933-1939 contained in Experiment Station Circular 83, Kudzu, Its Value and Use in Alabama, by D. G. Sturkie and J. C. Grimes, 1939.

2/ This plot was cut as many times as ready during 1st two years of experiment. These values are omitted.

3/ These plots were not cut these years in order to allow damaged stand to thicken.

4/ These plots were cut only once these years to allow damaged stand to thicken.

5/ 8 year average instead of 10.

SUMMARY

The information obtained after 1939 is of limited value because of the way some of the plots were treated. As the stand of some of the plots became thin because of cutting treatment, they were allowed to thicken before being cut again. It appears that this defeated the purpose of the experiment.

Kudzu for Hay - Terrace 17: Alexandria Field 1935-44

Objective:

To determine yield and persistence of kudzu under management for hay production.

Kudzu crowns were set in the spring of 1930 and the kudzu was cut for hay twice annually, in June and in October, from 1935 through 1944. No fertilizer was applied to the kudzu until 1943 when 400 lbs. superphosphate and 100 lbs. of muriate of potash per acre were disked into the soil.

The yields of hay are summarized in the following table.

Table 195 Pounds of Kudzu Hay Harvested per Acre

Alexandria Field

Year	June Cutting	October Cutting	Total
1935	3015	1680	4695
1936	1570	2286	3856
1937	4000	2000	6000
1938	3150	2425	5575
1939	2775	2600	5375
1940	2450	1625	4075
1941	No Harvest	3042	3042
1942	No Record		
1943	2641	3410	6051
1944	3358	3277	6635
9 Yr. Average			5034

Conclusions:

By 1944 Johnsongrass had invaded the stand of kudzu and it constituted much of the total hay produced. This and a similar invasion of a kudzu stand at Aliceville Field indicates that Johnsongrass will crowd out kudzu. The yield of hay in 1943 and 1944 following the spring application of fertilizer was considerably higher than it was during any of the five years immediately before fertilizer was applied. This increased yield may be due to increased growth of kudzu, Johnsongrass or both.

Deep vs. level planting of corn - - - -Auburn 5 year avg. 1951-1955

The same fertilizer was used in all cases. The fertilizer consisted of 400 lbs. 4-10-7 applied ahead of planting and a side dressing of 200 lbs. of ammonium nitrate per acre.

Method of planting: The land was plot broken in all cases. In case of deep planting a furrow was opened with a middle-buster running deep. The fertilizer was put in the furrow and mixed with the soil and the corn planted in the deep furrow. In case of level planting a shallow furrow was opened and the fertilizers applied and mixed with the soil. The corn was planted and covered so as to leave the soil practically level.

Cultivation: Was normal in all cases the soil was left level at laying-by.

Replications: 10 replications were used each year.

Table 196 The Yield of Corn in Depth of Planting Test

Depth of Planting	Yield of corn in bushels per acre					
	Year					
	1951	1952	1953	1954	1955	5 yr. avg. 1951-55
Level	47.7	27.9	67.1	19.6	64.5	45.4
Deep Furrow	60.1	31.9	69.5	20.6	65.1	49.4

CONCLUSIONS:

In only 1 year (1951) there was a significant difference in yield between the two methods. In 1951 planting in a deep furrow produced an increase of 25% in the yield. In the other 4 years there was no difference in the yield.

D. G. Sturkie

Soil Fumigation Studies

The results of soil fumigation studies conducted at the Plant Breeding Unit at Tallassee indicate that cotton wilt and nematodes may be satisfactorily controlled and profitable increases in lint yield obtained. Dowfume W85 and DD applied in the row at 2 and 7 1/2 gallons respectively per acre, have proven the most economical materials to use. The root-knot nematode is considered to be the primary parasitic nematode controlled at Tallassee, although several other parasitic types are present.

The experiments reported below were conducted on the Agronomy farm at Auburn. The area involved is a sandy soil analyzing 88.5 per cent sand. Cotton plants show extreme stunting in the area, with the tap root very much shortened or non-existent and with much branched lateral roots confined to the upper 2 to 4 inches of soil. Other crops are likewise stunted and yield poorly. An analysis of the soil showed no root-knot nematodes but large populations of the ectoparasitic and meadow nematode types.

Studies were made in 1954 and 1955 with soil funigants for the control of nematodes in this area. In 1954 Dowfume W-85 was applied over all at the rate of 5 gallons per acre. In 1955 Nemagon was similarly applied at the rate of 5 quarts per acre. Cotton, corn, sorghum and peanuts were the crops planted. The results of the two tests are summarized in the following table.

Table 197
Acre yields of several crops treated with soil fumigants. 1954 and 1955

Agronomy Farm

Treatment	Cotton lbs. lint	Corn Bus.	Sorghum, Lbs. Grain	Peanuts, Lbs. Dry shelled nuts
		Dowfume, W85, 1954		
Treated	347	42.2	1522	493
Untreated	275	39.4	654	409
Difference	72	2.8	868	84
		Nemagon, 1955		
Treated	1008	104.4		1597
Untreated	523	78.9		1789
Difference	485	25.5		-192

SUMMARY

The yields were not high in 1954 due to dry weather. The increases from treatment were considered significant with cotton, sorghum and peanuts. However, control was not considered satisfactory since much stunting and poor root growth occurred in the treated plots.

The 1955 test with Nemagon was much more satisfactory. Excellent control of nematodes was obtained with an increase in yield of essentially one bale of cotton and 25 bushels of corn. A slight reduction in yield of peanuts was not considered

From the results obtained Nemagon appears superior to Dowfume for fumigating sandy soils. Nemagon is a heavy material weighing 17.3 pounds per gallon, it has a lower vapor pressure, persists in the soil for a longer period than Dowfume, and apparently is much more effective.

A. L. Smith

Table 198 Effect of Rate of Seeding Lespedeza Sericea[1]/

Alicoville 1943-1947

Lbs. Seed Per Acre:	Lbs. Hay per acre					
	1943	1944	1945	1946	1947	Average 1943 - 1947
10[2]/	2932	3530	3563	4836	5916	4155
20	4582	5376	4915	6984	7356	5843
30	5492	5863	5116	7542	7818	6366
40	5623	5700	4986	7446	8028	6357
50	6448	5798	5148	7320	7620	6467

Remarks: Hay yields increased as the seeding rate was increased to 30 pounds. There was no increase above 30.

1/ Seeded April 16, 1942; cut 2 times each year for hay. 400# super and 50# muriate per acre in 1942. 500# 0-14-10 in 1946.

2/ Some weeds in each cutting on 10# rate. Other plots had few weeds.

Table 199 Pounds of Hay per acre produced by Varieties of Annual Lespedeza ---------- Upper Coastal Plains Substation

Variety[1]/	Pounds Dry Hay Per Acre		
	1952	1953	Average
Common Lespedeza	1502	2276	1889
Climax Lespedeza	1474	2054	1764
Kobe Lespedeza	1731	2190	1960
Korean Lespedeza	930	1505	1218
Rowan	1077	2765	1921

1/ Fertilizer: 500# per acre 0-16-8 at planting (1952) none applied in 1953.

Remarks: The two-year average yields indicate that Korean is less productive than the other entries. There appears to be little difference in yields of the other entries.

E. D. Donnelly