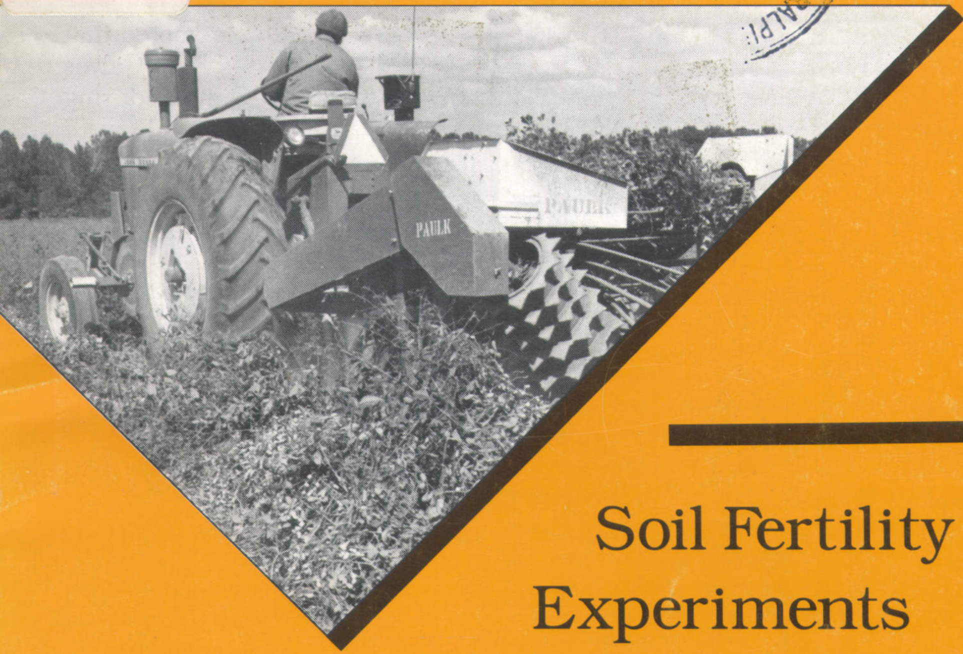

Soil Fertility Experiments with Peanuts in Alabama 1973-1986

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Soil Fertility Experiments with Peanuts in Alabama, 1973-1986

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PEANUTS ARE a major farm income producer in several southeastern Alabama counties. The crop has been grown for many years under some sort of production allotment system regulated by the U.S. Department of Agriculture. This system has resulted in a nearly constant acreage of planted peanuts not only for the years covered in this report, table 1, but also for the last 3 decades. Farmers have tried to offset constant acreage with higher per acre yields by using improved varieties and better management practices. Except when severe weather conditions were limiting, average peanut yields in Alabama have continued to climb during the last 25 years. The continued increase in yields is attributed to improved varieties, better control of certain diseases and insects, improved digging and harvesting machinery, and improved soil management practices.

[1]Respectively, Agronomist-Peanuts and Assistant Professor of Agronomy and Soils.

TABLE 1. TOTAL ACREAGE AND YIELD PER ACRE OF PEANUTS IN ALABAMA DURING 1974-86

Year	Acres	Yield/acre
	No.	*Lb.*
1973	191,000	2,030
1974	201,000	2,360
1975	202,000	2,600
1976	210,000	2,390
1977	211,000	2,740
1978	209,000	2,640
1979	210,000	2,785
1980	200,000	1,325
1981	222,000	2,715
1982	177,000	2,950
1983	180,000	2,525
1984	219,000	2,960
1985	200,000	2,950
1986	219,000	2,260

Effective soil management requires knowledge of the relationship between crop yield and quality and soil fertility levels. The Alabama Agricultural Experiment Station first researched lime and fertilizer needs of peanuts during the early 1900s on farmers' fields (*3*). Subsequently, the Wiregrass Substation near Headland became the focal point for peanut research in Alabama, and it continues to be a major center for such research. However, it was recognized early that soil fertility research must also be conducted on farmers' fields in peanut-producing areas because of the diversity of soils on which peanuts are grown and because peanut yields are affected by previous cropping systems.

After fertilizer and liming recommendations for peanuts became based on soil testing, it became evident that the research information on which soil testing is based must be updated continually. This need was met in 1967 by initiating a cooperative soil-fertility, on-farm research program that involved growers, the Alabama Peanut Producers Association, and the Alabama Agricultural Experiment Station. The early findings were impressive, and results of the first 5 years (120 experiments) were published in 1973 (*4*).

The project has continued and has researched many facets of soil fertility that are of interest to peanut growers. Major findings have been published separately in professional journals (*1,2,5*), but most farmers and local agricultural advisors do not have ready access to these publications. Thus, this bulletin compiles the results of all on-farm soil fertility experiments with peanuts since 1972 into a single volume to make this record available to growers and their advisors.

GENERAL EXPERIMENTAL PROCEDURE

Soil samples received by the Auburn University Soil Testing Laboratory were screened to select fields that were applicable for conducting the research. Farmers contributed to the cooperative venture by following their normal practices of producing peanuts, except for the specific research treatment imposed at each test site. Harvesting of plots was a joint effort by each farmer and the researcher. Yields and grades of peanuts were determined by the researcher. Soon after harvest, soil samples were taken from each untreated plot and analyzed by the Auburn University Soil Testing Laboratory.

Test procedures and results are presented individually for each of the following: Phosphorus-Potassium (P-K) Experiments, Gypsum Experiments, Liming Experiments, Liming and Gypsum Experiments, Inoculation and Nitrogen Fertilizer Experiments, Miscellaneous Fertilizer Experiments, and Reduced Tillage Experiments.

PHOSPHORUS-POTASSIUM (P-K) EXPERIMENTS

These experiments were located on soils that varied widely in soil-test P (4 to 90 pounds per acre) and in soil-test K (9 to 220 pounds per acre). Each test site consisted of eight plots, and each plot consisted of six 100-foot rows spaced 3 feet apart. Four plots were fertilized with 0-10-20 at a rate of 400 pounds per acre, and four plots remained unfertilized. The Florunner variety was planted on all sites except one.

Although most of the 37 experimental sites tested "Low" or "Very Low" in either P or K, yields were increased by P-K fertilizer at only 6 sites, table 2. Clearly, the soil-test ratings did not correctly predict yield increases from fertilizer in most cases, and these data can be used to define more accurately soil-test P and K levels where additional fertilizer is needed for maximum yield.

Although both P and K were added to all fertilized plots, the yield increases were caused by the K component. For example, yield increases from fertilizer occurred with soil-test P ranging between 4 and 47 pounds per acre (greatest yield increases occurred with soil-test P at 42 and 47 pounds per acre). Soil-test K for these same sites ranged between 9 and 28 pounds per acre, with the greatest yield increases occurring with soil-test K at 9 to 11 pounds per acre. Although soil-test P varied between 2 and 90 pounds per acre, there was no correlation between soil-test P and yield increases from the fertilizer. Soil-test K varied between 9 and 210 pounds per acre and was highly correlated with yield increases. By graphing yield as a function of soil-test K, the critical level of soil-test K for maximum yield was calculated to be 30 pounds per acre, see graph, page 8.

Yield increases from K fertilizer varied from 350 pounds per acre (soil-test K = 18 pounds per acre) to 1,260 pounds per acre (soil-test K = 11 pounds per acre). Percentage of sound mature kernels (SMK) was unaffected by the fertilizer.

The efficiency with which Florunner peanuts obtain P and K nutrients from the soil is demonstrated by the results of these experiments. The experiments failed to determine the critical soil-test P level for deficiency, but they did identify the critical soil-test K as about 30 pounds per acre.

There was one fertilizer experiment with the Florigiant variety (site 117). Although soil-test K was only 19 pounds per acre, application of 400 pounds per acre of 0-10-20 failed to affect yield or grade. This result suggests that the Florigiant variety is about as efficient as the Florunner variety in obtaining potassium from the soil.

TABLE 2. EFFECT OF A PHOSPHORUS (P) AND POTASSIUM (K) FERTILIZER (400 POUNDS PER ACRE OF 0-10-20) ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test		Yield/acre		Grade	
				P/acre	K/acre	No fertilizer	Fertilizer	No fertilizer	Fertilizer
				Lb.	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*
181	D. Hartzog	Barbour	Wagram ls	42	9	1,870	3,120*	71	72
202	B. Deloney, Jr.	Dale	Troup ls	12	9	2,510	3,330*	76	75
189	B. Deloney, Jr.	Dale	Troup ls	9	10	1,820	2,700*	66	65
169	R. Beaty	Barbour	Fuquay ls	47	11	1,240	2,500*	66	70*
211	C. Trawick	Henry	Troup ls	25	13	2,840	2,640	74	75
210	B. Deloney, Jr.	Dale	Alaga ls	18	18	2,040	2,380*	69	73*
230	Deal Bro.	Dale	Bonifay ls	4	21	2,670	2,950	68	69
208	J.C. Caraway	Barbour	Fuquay ls	11	23	3,210	3,420	74	75
158	J. & T. Beasley	Henry	Fuquay ls	40	24	3,710	4,190	74	75
229	C. Trawick	Henry	Troup ls	4	28	2,910	3,620*	75	73
337	D. Hartzog	Barbour	Dothan ls	4	28	3,900	4,070	78	77
116	B. & W. Holland	Houston	Riverview sl	33	30	3,740	3,920	70	72
212	C. Trawick	Henry	Troup ls	25	34	3,080	3,150	75	72
190	F. Fuquay	Barbour	Fuquay ls	47	36	3,660	3,360	62	65
191	M. Johnson	Henry	Fuquay ls	17	36	3,520	4,080	69	67
274	J. Burke	Barbour	Lucy ls	15	40	3,790	3,920	76	76
131	J. Stanford	Henry	Dothan fsl	34	41	2,530	2,630	74	74
132	M. Barnette	Henry	Dothan sl	22	41	2,720	2,710	72	73
156	Parker Farms	Henry	Fuquay ls	61	41	3,270	3,300	71	72
207	J. & L. Fenn	Barbour	Dothan sl	29	42	3,350	3,410	76	76
134	Parker Farms	Henry	Varina sl	21	43	4,290	4,040	74	73
159	J. & R. Taylor	Henry	Wagram ls	23	43	4,040	4,010	72	72
231	Deal Bro.	Dale	Dothan ls	2	42	3,480	3,820	76	76
157	Parker Farms	Henry	Pine Flat ls	49	45	4,410	4,470	73	74

Continued

TABLE 2 (CONTINUED). EFFECT OF A PHOSPHORUS (P) AND POTASSIUM (K) FERTILIZER (400 POUNDS PER ACRE OF 0-10-20) ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test		Yield/acre		Grade	
				P/acre	K/acre	No fertilizer	Fertilizer	No fertilizer	Fertilizer
				Lb.	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*
232	R. & B. Price	Pike	Lucy ls	19	45	4,030	4,110	76	73
199	L. Spivey	Henry	Faceville sl	15	52	3,280	3,320	75	76
233	J. & L. Harden	Pike	Red Bay ls	31	52	4,340	4,380	78	80
168	M. Strickland	Crenshaw	Orangeburg sl	14	54	4,280	4,390	76	75
130	H. Hicks	Henry	Dothan sl	15	55	5,720	5,790	74	73
133	Parker Farms	Henry	Pine Flat ls	47	59	4,500	4,450	76	77
209	J.L. Falkner	Henry	Faceville sl	65	64	2,740	2,960	78	77
167	G. & R. Holland	Henry	Orangeburg sl	27	65	3,860	4,360	77	76
192	M. Strickland	Crenshaw	Brogdon ls	89	68	4,150	4,190	72	69
270	B. Deloney, Jr.	Dale	Dothan ls	39	74	4,850	4,670	71	72
273	W. Shelley	Houston	Saucier sl	22	86	4,170	4,110	69	69
226	S. Bradshaw	Houston	Dothan sl	20	182	2,870	2,710	73	70
314	Wallace Jr. College	Dale	Tifton sl	37	217	4,850	4,690	78	78
336	B.W. Danzey	Henry	Orangeburg sl	17	241	2,950	2,870	74	74
117[1]	E.E. White	Dale	Eustis ls	49	19	2,240	2,250	66	65

[1]Florigiant was the variety in this experiment.
*Yield increases were significant at 10 percent level.

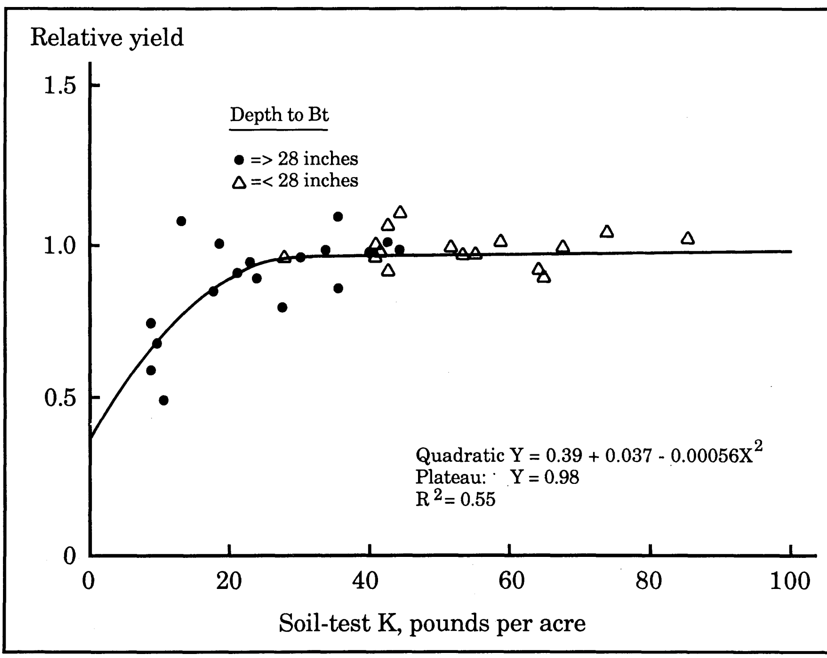
Auburn University for several years has recommended that fertilizer for peanuts be applied to other crops in the rotation. Results of experiments in this report, however, show that K fertilizer applied directly to peanuts is needed where soil-test K is less than 30 pounds per acre.

GYPSUM EXPERIMENTS

Soil fertility experiments on farmers' fields and at the Wiregrass Substation have shown that calcium (Ca) is the most common yield-limiting soil nutrient for peanut production. The experiments reported establish the minimum level of soil test Ca needed for maximum yield and grade of the Florunner variety. They also evaluate and compare available sources of Ca that are used to increase levels of soil Ca.

Use of Recommended Rate

The recommended rate of gypsum (calcium sulfate) for peanuts is 500 pounds per acre applied as a topdressing at early bloom. The ef-



Relative yield of Florunner peanuts versus soil-test K levels of the unfertilized plots.

TABLE 3. EFFECT OF 500 POUNDS PER ACRE OF GYPSUM APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF PEANUTS

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No gypsum	Gypsum	No gypsum	Gypsum
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
	Florunner variety								
217	G. & A. Carter	Pike	Troup ls	4.6	70	1,570	2,970*	63	74*
144	T. Baxter	Henry	Bonifay ls	5.2	80	320	1,140*	61	74*
218	C. Trawick	Henry	Troup ls	5.8	100	430	1,750*	58	67*
272	Deal Bro.	Dale	Troup ls	5.0	100	1,010	2,880*	66	73*
183	M.O. Johnson	Henry	Fuquay ls	5.3	110	3,220	3,910*	65	66
138	Q. Brown	Barbour	Poarch sl	4.9	120	1,840	2,160	67	75*
152	J. Stanford	Henry	Lucy ls	5.2	120	1,450	1,850	65	71
125	W. Griffin	Coffee	Red Bay sl	4.9	130	1,780	2,830*	62	75*
238	Parker Farms	Henry	Americus ls	4.8	140	1,210	2,870*	57	64*
237	Deal Bro.	Dale	Bonifay ls	5.3	140	1,240	2,620*	60	72*
139	J. Brown	Barbour	Fuquay ls	5.1	140	1,330	2,310*	66	75*
186	H. Lee	Pike	Wagram ls	5.0	160	1,300	2,220*	68	71
292	R. & B. Price	Pike	Troup ls	5.3	160	2,690	4,350*	62	70*
143	D. Spivey	Barbour	Orangeburg ls	5.2	160	2,070	2,510	69	75*
259	Deal Bro.	Dale	Cowarts sl	5.3	190	4,640	4,480	72	72
149	Q. Brown	Barbour	Smithdale sl	4.7	190	2,220	2,350	72	74
145	B. Ward	Henry	Dothan sl	5.4	200	2,110	2,460*	68	77*
118	G. Crowley	Houston	Dothan sl	5.0	210	4,290	4,310	74	74
137	J. Smith	Pike	Red Bay ls	5.3	220	2,860	2,720	72	71
219	F. Newman	Henry	Esto ls	5.6	220	2,160	2,650	72	76*
280	Mobley Farms	Henry	Norfolk fsl	5.3	230	2,880	3,080	66	69
307	R. Harris	Dale	Bonifay ls	5.7	240	2,930	3,470	67	71
127	J.C. Hardwick	Henry	Red Bay sl	5.5	240	2,640	2,780	64	70*
126	P. Martin	Coffee	Red Bay sl	5.2	250	3,020	2,860	73	73
154	D. & L. Hartzog	Barbour	Red Bay sl	4.9	270	3,440	2,800	75	77
155	Fuller-Crowley	Coffee	Bonifay ls	5.6	290	2,870	3,200	76	77
153	G. Crowley	Henry	Dothan ls	5.2	300	3,580	3,420	72	74

Continued

TABLE 3 (CONTINUED). EFFECT OF 500 POUNDS PER ACRE OF GYPSUM APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF PEANUTS

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No gypsum	Gypsum	No gypsum	Gypsum
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
	Florunner variety								
322	D. Hartzog	Barbour	Fuquay ls	5.9	310	3,210	3,190	75	76
119	J. Senn	Pike	McLaurin ls	6.3	360	2,400	2,270	66	69
303	L. Richardson	Pike	Cowarts sl	6.0	360	4,380	4,500	69	68
296	T. Beasley	Henry	Fuquay ls	6.0	390	4,290	4,560	76	76
120	W.R. Davis	Crenshaw	Lakeland ls	5.6	410	3,180	3,220	75	76
188	D. Beasley	Henry	Orangeburg sl	5.8	450	2,600	2,650	66	65
338	Wallace Jr. College	Dale	Bonifay ls	6.0	480	2,650	2,670	67	65
121	W.R. Davis	Crenshaw	Lakeland ls	5.9	490	2,040	2,180	75	76
309	G. Caylor	Coffee	Orangeburg ls	6.0	490	3,070	3,030	74	72
242	J. Solomon	Henry	Orangeburg ls	5.6	530	4,540	4,510	72	73
122	J. Adams	Henry	Dothan sl	6.2	560	2,110	2,180	63	62
291	G. Crowley	Houston	Dothan sl	6.0	590	5,160	5,150	72	72
282	D. Averett	Coffee	Red Bay sl	6.1	670	3,780	3,730	74	75
128	Parker Farms	Henry	Norfolk sl	5.8	680	2,500	2,360	76	75
243	J. Solomon	Houston	Red Bay sl	5.9	900	3,320	3,170	75	74
244	McAllister Farms	Houston	Dothan fsl	6.0	1,030	3,620	3,750	65	64
245	F. Britt	Coffee	Red Bay sl	5.9	1,140	3,530	3,360	64	65
	Sunbelt Runner variety								
266	Deal Bro.	Dale	Cowarts sl	5.6	270	4,580	4,310	71	73
	Sunrunner variety								
292	R. & B. Price	Pike	Troup ls	5.3	160	2,400	4,410*	53	70*
306	R. Harris	Dale	Bonifay ls	5.6	210	2,440	3,250*	64	70*
263	Deal Bro.	Dale	Cowarts sl	5.4	220	4,780	4,670	73	75
343	D. Hartzog	Barbour	Dothan ls	6.1	250	3,690	4,110	73	76*
295	T. Beasley	Henry	Fuquay ls	5.3	340	4,240	4,440	75	74
323	D. Hartzog	Barbour	Fuquay ls	6.0	390	3,070	2,970	74	77
283	D. Averett	Coffee	Red Bay sl	6.1	780	3,300	3,260	76	75

Continued

TABLE 3 (CONTINUED). EFFECT OF 500 POUNDS PER ACRE OF GYPSUM APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF PEANUTS

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No gypsum	Gypsum	No gypsum	Gypsum
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
	Florigiant variety								
129	M. Barnett	Henry	Gritney ls	5.1	130	380	2,470*	52	66*
	Early Bunch variety								
184	E.E. White	Henry	Orangeburg sl	5.7	420	4,150	4,210	68	71
185	C. Weeks	Houston	Lucy ls	5.8	440	2,590	2,440	50	62
	NC-7 variety								
294	R. & B. Price	Pike	Troup ls	5.2	160	930	4,050*	24	66*
308	R. Harris	Dale	Bonifay ls	5.5	200	700	2,790*	47	65*
302	L. Richardson	Pike	Cowarts sl	5.9	340	4,210	4,310	70	69
310	G. Caylor	Coffee	Orangeburg ls	6.1	420	3,290	3,110	66	69
281	D. Averett	Coffee	Red Bay sl	5.9	570	3,400	3,560	73	74
298	McAllister Farms	Houston	Faceville sl	6.3	720	4,700	4,880	70	69
327	Mcallister Farms	Houston	Orangeburg sl	6.6	790	4,110	3,640	66	66
326	B. Deloney, Jr.	Dale	Saucier sl	6.5	1,000	3,640	3,610	75	76
	GK-3 variety								
325	B. Deloney, Jr.	Dale	Saucier sl	6.4	1,030	4,020	3,990	71	68
349	Falkner Farms	Henry	Orangeburg sl	6.1	460	3,980	4,140	60	64*
	GK-7 variety								
344	D. Hartzog	Barbour	Dothan ls	6.1	330	3,870	3,960	76	76
324	D. Hartzog	Barbour	Fuquay ls	6.0	410	2,950	3,220	76	77

*Different between treatments at 10 percent level of significance.

fect of this rate on yield and grade of several peanut varieties is illustrated by data in table 3.

The Florunner variety was grown on soils ranging in soil-test Ca between 70 and 1,140 pounds per acre. Of the 14 experimental sites with soil-test Ca at 160 pounds per acre or less, gypsum increased both yield and percent sound mature kernel (SMK) at 9 and either yield or SMK at 4. One of six experiments with soil-test Ca between 190 and 220 pounds per acre had both yield and SMK increased by gypsum, while one had only increased SMK. Gypsum applications on soils testing more than 220 pounds per acre of available Ca had no effect on yield or grade.

A single experiment with Sunbelt runner showed no effect of adding gypsum to a soil with a soil-test Ca of 270 pounds per acre. Two of seven experiments with the Sunrunner variety had soil-test Ca of less than 220 pounds per acre, and both showed yield and SMK increases from gypsum application. In the other five experiments, which had soil-test Ca of 220 pounds per acre or more, gypsum failed to affect yield, but did increase grade at one site where soil test Ca was 250 pounds per acre.

A single experiment with the Florigiant variety showed a yield increase of 1 ton per acre and an SMK increase of 14 percentage points from gypsum applied to a soil with only 130 pounds of soil-test Ca.

Of eight experiments with NC-7, two were on soils with available Ca of 200 pounds per acre or less. Both showed dramatic increases in both yield and grade. The other experiments had soil-test Ca of 340 or more, and neither yield nor grade was affected by a gypsum application.

There were two experiments with Early Bunch and one each with GK-3 and GK-7. Soil-test Ca was 410 pounds or more, and gypsum failed to affect yield or grade.

Rates of Gypsum

There has been little incentive in the past to determine if gypsum rates lower than the recommended 500 pounds per acre would be equally effective. Thus, gypsum rates of 250 and 500 pounds were compared on the Florunner variety in seven fields in which soil-test Ca ranged from 100 to 360 pounds per acre. With soil-test Ca at 290 and 360 pounds per acre (sites 155 and 119), neither rate of gypsum affected yield or SMK, table 4. Of the five experiments with yield and/or SMK increases, the 500-pound rate was not superior to the 250-pound rate.

TABLE 4. EFFECT OF RATES OF GYPSUM APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test		Yield/acre			Grade		
				pH	Ca/acre	No gypsum	250 lb. gypsum	500 lb. gypsum	No gypsum	250 lb. gypsum	500 lb. gypsum
					Lb.	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*
272	Deal Bro.	Dale	Troup ls	5.0	100	1,010b	2,340a	2,880a[1]	66	74*	73*
138	Q. Brown	Barbour	Poarch sl	4.9	120	1,840b	2,300a	2,160ab	67	75*	75*
139	J. Brown	Barbour	Fuquay ls	5.1	140	1,330b	2,330a	2,310a	66	75*	75*
237	Deal Bro.	Dale	Bonifay ls	5.3	140	1,240b	2,690a	2,620a	60	72*	72*
238	Parker Farms	Henry	Americus ls	4.8	140	1,210b	2,630a	2,870a	57	64*	64*
155	Fuller-Crowley	Coffee	Bonifay ls	5.6	290	2,870	2,890	3,200	76	77	77
119	J. Senn	Pike	McLaurin ls	6.3	360	2,400	2,420	2,270	66	68	69

[1]Means in a row followed by the same letter are not different at the 10 percent level of significance.
*Treatments different at 10 percent level of significance.

"420 Landplaster" versus Gypsum

Three experiments were conducted with the Florunner variety to compare the effects on yield and SMK of regular, finely ground gypsum and a granular calcium sulfate compound known as "420 landplaster" (marketed by U.S. Gypsum, Inc).

The materials were compared at 250- and 500-pound-per-acre rates. Two application methods and dates were compared: (1) broadcast at planting with no incorporation, and (2) applied in 12- to 14-inch bands over the row about 60 days after planting (early bloom). All three sites had low soil Ca, and each was ideal for evaluating sources, rates, and application times.

Yields were generally doubled or tripled and SMKs were increased 5 to 15 percentage points by the calcium treatments, table 5. Equal increases were obtained by both Ca sources, at both Ca rates, and by both application dates.

Gypsum versus Basic Slag

For low rates of Ca to be effective in correcting Ca deficiency in peanuts, the Ca compound must be reasonably soluble in water. Gypsum, for example, is soluble enough to supply all the Ca that a peanut crop needs. A liming material, in contrast, is not soluble in water but is soluble in acid. It has long been known that lime will be dissolved by an acid soil if the two are mixed intimately. However, little lime dissolves if it is surface-applied on a soil and left undisturbed.

Basic slag was a popular liming material in Alabama for many years, and its effectiveness as a calcium source was compared with gypsum in a single experiment with the Florigiant variety. Results of a test designed to compare these sources show tremendous increases in yield and SMK from topdressed gypsum at early bloom, but no effect from an equal application of basic slag, table 6. This experiment confirms that a liming material is not a suitable Ca source when applied as a topdressing at early bloom.

LIMING EXPERIMENTS

Liming acid soils of southeastern Alabama has long been known to be beneficial for peanut production. It has been assumed that liming improved peanut yields and grades for these reasons: (1) reduced aluminum toxicity, (2) reduced manganese toxicity, (3) increased molybdenum availability, (4) increased nitrogen fixation by rhizobia, and (5) increased calcium availability.

TABLE 5. COMPARISON OF 420-LANDPLASTER AND GYPSUM AS CALCIUM SOURCES FOR FLORUNNER PEANUTS

Site no.	Soil test		Yield per acre					Grade				
			No Ca	250-lb. rate		500-lb. rate		No Ca	250-lb. rate		500-lb. rate	
	pH	Ca/acre		Land-plaster	Gypsum	Land-plaster	Gypsum		Land-plaster	Gypsum	Land-plaster	Gypsum
		Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
Calcium applied at planting												
272	5.0	100	1,010	2,740*	3,850*	2,060*	2,620*	66	76*	74*	74*	75*
237	5.3	140	1,240	3,070*	2,680*	2,810*	2,750*	60	73*	75*	75*	70*
238	4.8	140	1,210	2,650*	2,430*	2,740*	2,650*	57	63*	63*	63*	61*
Calcium applied at early bloom												
272	5.0	100	1,010	2,990*	2,340*	3,420*	2,880*	66	74*	74*	78*	73*
237	5.3	140	1,240	3,060*	2,690*	3,090*	2,620*	60	75*	72*	71*	72*
238	4.8	140	1,210	2,730*	2,630*	2,510*	2,870*	57	60	64*	63*	64*

*Treatments different from no Ca at 10 percent level of significance.

TABLE 6. A COMPARISON OF THE EFFECT OF 500 POUNDS PER ACRE OF GYPSUM OR BASIC SLAG APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF FLORIGIANT PEANUTS

Site no.	Farmer	County	Soil type	Soil-test		Yield per acre			Grade		
				pH	Ca/acre	None	Basic slag	Gypsum	None	Basic slag	Gypsum
					Lb.	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*
129	M. Barnett	Henry	Gritney sl	5.1	130	380	580	2,470*	52	42	66*

*Treatments different at 10 percent level of significance.

The unique fruiting habit of the peanut plant makes it particularly susceptible to calcium deficiency and Auburn University has long recommended liming materials as effective calcium sources for peanuts. However, there is no convincing evidence that properly applied lime has any beneficial effect on peanuts beyond that of being a good calcium source.

Spring-Applied Lime

Sites for the liming experiments were selected with soil pH below 6.0. The experiments consisted of eight plots, four limed and four unlimed. Dolomitic limestone was applied at 1 ton per acre after the land was turned in the spring and just prior to planting. It was broadcast and disked in to a depth of about 4 inches. Unlimed plots were sampled for soil testing in the fall after harvest.

The Florunner variety was planted in all tests except one (site 129). Yield and/or grade increases were caused by liming with soil pH ranging between 4.3 (site 241) and 5.4 (site 197 and 145), table 7. At the same time, yields and grades were unaffected by liming at other sites with soil pH between 4.7 (site 149) and 5.8 (sites 128 and 188). Thus, there was considerable overlapping of soil pH where liming improved yields and grades at some sites, but not at others.

By listing the sites in order of increasing soil-test calcium, the relationship between liming effect and soil-test Ca becomes clear, table 7. For example, liming increased yield at 11 of 14 sites with soil-test Ca at less than 150 pounds per acre without regard to soil pH. Percentage SMK was increased at 11 of the 14 sites. Of the 11 sites with soil-test Ca at 150 to 200 pounds per acre, liming increased yields at 5 sites and increased SMK at 6. Among the 11 sites with soil-test Ca of 210 to 260 pounds per acre, 1 had a yield increase and 2 had SMK increases from liming.

Lime was without effect on yields and grades where soil-test Ca exceeded 260 pounds per acre.

Calcitic versus Dolomitic Limestone

Most soils in southeastern Alabama are inherently low in available soil magnesium (Mg), and some farm advisors assume that Mg is needed as a soil supplement. If this were true, the most economical and effective source would be dolomitic limestone. However, Alabama research has not previously found an incidence of Mg deficiency in peanuts, and this is the general experience wherever peanuts are grown. Clearly, peanuts are unusually effective in obtaining Mg from soils that are quite low in that essential nutrient.

TABLE 7. EFFECT OF LIMING ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No lime	Lime	No lime	Lime
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
225	C. Trawick	Henry	Troup ls	4.8	50	710	2,390*	66	70*
144	T. Baxter	Henry	Bonifay	5.2	80	320	2,440*	61	74*
224	D. Hartzog	Barbour	Dothan sl	4.7	80	1,310	2,420*	46	59*
182	D. Hartzog	Barbour	Bonifay ls	5.2	100	2,370	3,270*	63	70*
179	J. & L. Fenn	Barbour	Cowarts ls	5.1	100	2,500	3,590*	65	73*
199	L. Spivey	Henry	Faceville sl	5.2	110	2,150	2,960	67	75*
220	White & Sowell	Henry	Dothan ls	4.9	110	2,510	3,540*	69	74*
152	J. Stanford	Henry	Lucy ls	5.2	120	1,450	1,900*	65	71
165	D. & L. Hartzog	Barbour	Varina ls	5.2	130	3,310	3,720	66	71*
222	L. Spivey	Henry	Faceville sl	5.0	130	1,780	2,920*	68	69
150	J. Kelly	Henry	Red Bay sl	4.8	130	2,320	3,470*	63	74*
125	W. Griffin	Coffee	Red Bay sl	4.9	130	1,780	2,580*	62	71*
166	A. Drinkard	Pike	Orangeburg fsl	5.3	140	2,190	2,600*	73	74
171	M. Thrash	Pike	Troup ls	5.1	140	3,080	3,840	74	72
147	B. Deloney, Jr.	Dale	Iuka ls	5.1	150	3,200	3,110	75	74
197	M. Murphy	Henry	Bonifay ls	5.4	150	3,240	3,830	74	75
198	D. Hartzog	Barbour	Dothan sl	5.2	160	3,270	4,650	71	76*
178	M. Strickland	Crenshaw	Orangeburg sl	5.1	160	1,910	2,390*	69	71
143	D. Spivey	Barbour	Orangeburg ls	5.2	160	2,070	3,060	69	72*
241	C. Alley	Houston	Faceville sl	4.3	160	3,710	4,570*	69	74*
221	Parker Farms	Henry	Esto ls	5.2	180	2,090	3,750*	62	73*
149	Q. Brown	Barbour	Smithdale sl	4.7	190	2,220	2,140	72	75
268	M.C. Douglas	Houston	Dothan ls	5.4	190	3,050	3,290	75	75
145	B. Ward	Henry	Dothan sl	5.4	200	2,110	2,800*	68	76*
175	H. Adams	Barbour	Gritney sl	5.2	200	2,280	3,030*	67	73*
146	T. & H. Littlefield	Houston	Dothan ls	5.0	210	2,670	2,430	72	74
196	Parker Farms	Henry	Esto ls	5.3	220	3,190	3,470	69	67
177	H. Adams	Barbour	Orangeburg sl	5.5	220	2,210	2,630	68	71
280	Mobley Farms	Henry	Norfolk fsl	5.3	230	2,880	2,740	66	70*

Continued

TABLE 7 (CONTINUED). EFFECT OF LIMING ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No lime	Lime	No lime	Lime
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
162	T. & H. Littlefield	Houston	Sunsweet ls	4.9	230	3,020	3,290	75	75
201	J.B. Beck	Houston	Tifton sl	5.3	230	3,500	3,620	70	72
223	T. Fain	Geneva	Esto fsl	5.0	230	1,370	1,740*	74	73
148	R.W. Hughes	Houston	Dothan sl	5.3	240	3,750	3,620	78	78
127	J.C. Hardwick	Henry	Red Bay sl	5.5	240	2,640	2,740	65	67
126	P. Martin	Coffee	Red Bay sl	5.2	250	3,020	3,050	73	72
180	Golden Bro.	Henry	Gritney sl	5.3	260	1,590	2,490	62	69*
154	D. & L. Hartzog	Barbour	Red Bay sl	4.9	270	3,440	2,930	75	76
200	J. Best	Houston	Orangeburg sl	5.3	270	3,770	4,110	76	76
164	B. Lindsay	Henry	Dothan ls	5.2	280	2,800	2,660	76	76
163	M. Griffin	Henry	Orangeburg ls	5.5	280	2,150	2,260	73	74
160	D. Nowell	Dale	Red Bay sl	5.1	290	3,020	3,040	71	73
153	G. Crowley	Henry	Dothan ls	5.2	300	3,580	3,850	72	73
161	D. Beasley	Henry	Dothan ls	5.2	320	2,550	3,010	73	73
142	Thomas & Hopkins	Houston	Norfolk sl	5.6	330	2,770	2,770	71	71
183	M.O. Johnson	Henry	Rumford ls	5.7	400	3,480	3,240	69	69
141	W.L. Trawick	Henry	Dothan ls	5.5	410	3,820	3,880	77	77
269	R. Beaty	Barbour	Fuquay ls	5.5	420	4,940	4,900	75	75
140	S. Farmer	Henry	Dothan sl	5.6	450	2,980	3,180	76	75
188	D. Beasley	Henry	Orangeburg sl	5.8	450	2,600	2,500	66	65
128	Parker Farms	Henry	Norfolk sl	5.8	680	2,500	2,420	76	76
129[1]	M. Barnett	Henry	Gritney sl	5.1	130	380	2,850*	52	63

[1]Florigiant was the variety in this experiment.
*Treatments different at 10 percent level of significance.

Six experiments were conducted on soils in which calcitic limestone was compared with dolomitic limestone, table 8. At each site, there were four unlimed plots, four plots limed with dolomitic limestone, and four limed with calcitic limestone. Soil-test Mg ranged between 7 and 28 pounds per acre. Only the lowest Mg site (7 pounds per acre) showed an advantage for dolomitic over calcitic limestone. No other incidence of yield response to added Mg amendment was found for peanuts.

Limestone versus Basic Slag

There are several industrial by-products on the market that are effective liming materials. One is a waste material from steel manufacturing, generally called basic slag. Because of the decline of steel making in Alabama, there is now much less interest in the use of basic slag as a liming material than in earlier years.

To demonstrate the effectiveness of basic slag as a calcium source for peanuts when properly applied, five experiments were conducted on soils ranging in soil-test Ca from 130 to 410 pounds per acre, table 9. The Florunner variety was planted in each experiment. The test area consisted of four unlimed plots, four limed with dolomitic limestone, and four limed with basic slag. Each liming material was spread on turned land at a rate of 1 ton per acre and incorporated into the top 3 to 4 inches of soil by disking. No other land preparation was used prior to planting. This procedure ensured that the liming material remained in the pegging zone during fruiting where its calcium was needed for pod-fill.

Either yield or grade was increased by both lime sources on the two soils with soil-test Ca at 130 or 140 pounds per acre, table 9. There was no yield or SMK increase with soil-test Ca at 280 pounds per acre or higher. This was consistent with results of other liming experiments, tables 7 and 8.

It was noted earlier that topdressing with basic slag at early bloom was ineffective in supplying Ca for pod filling, table 6. However, the results reported in table 9 show that if basic slag is incorporated in the pegging zone prior to planting, it will react with the acid soil and release adequate Ca for a crop of peanuts that same year.

Lime Suspensions

During the latter half of the 1970s, there was much interest in applying limestone as a slurry. The concept was based on (1) utilizing liquid-fertilizer equipment more effectively and (2) using high-

TABLE 8. A COMPARISON OF THE EFFECTS OF CALCITIC AND DOLOMITIC LIMESTONES ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test			Yield/acre			Grade		
				pH	Ca/acre	Mg/acre	None	Calcitic	Dolomitic	None	Calcitic	Dolomitic
					Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*
171	M. Thrash	Pike	Troup ls	5.1	140	7	3,080	3,340	3,840*	74	75	72
146	T. & H. Littlefield	Houston	Dothan ls	5.0	210	10	2,670	2,680	2,430	72	72	74
147	B. Deloney, Jr.	Dale	Iuka ls	5.1	150	14	3,200	3,260	3,110	75	75	74
150	J. Kelly	Henry	Red Bay sl	4.8	130	16	2,320	3,540*	3,470*	63	73*	74*
148	R.W. Hughes	Houston	Dothan sl	5.3	240	18	3,750	3,620	3,620	78	79	78
149	Q. Brown	Barbour	Smithdale sl	4.7	190	28	2,220	2,180	2,140	72	73	75

*Treatment different from control at 10 percent level of significance.

TABLE 9. A COMPARISON OF THE EFFECTS OF 1 TON PER ACRE OF SPRING-APPLIED LIMESTONE AND BASIC SLAG ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test		Yield/acre			Grade		
				pH	Ca/acre	None	Lime	Basic slag	None	Lime	Basic slag
					Lb.	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*
165	D. & L. Hartzog	Barbour	Varina ls	5.2	130	3,310	3,720	3,470	66	71*	70
166	A. Drinkard	Pike	Orangeburg fsl	5.3	140	2,190	2,600*	2,610*	73	74	74
164	B. Lindsay	Henry	Dothan ls	5.2	280	2,800	2,660*	2,600	76	76	77
142	Thomas & Hopkins	Houston	Norfolk sl	5.6	330	2,770	2,770	2,820	71	71	73
141	W.L. Trawick	Henry	Dothan ls	5.5	410	3,820	3,880	3,980	77	77	76

*Treatment different from control at 10 percent significance level.

grade, finely ground limestone. The suspensions usually consisted of about 50 percent limestone, 48 percent water, and 2 percent clay (as a suspension stabilizer).

Although the per-pound cost of lime was greater in suspension than in dry form, proponents argued that suspensions were also more effective because of more even distribution and the higher neutralizing value of the lime's extra fineness. For lime slurries to approach economic competitiveness with regular agricultural limestone, dealers proposed that the slurry be added at a rate of 1,000 pounds per acre. This would supply about 500 pounds of actual limestone.

Since peanuts appeared to be a suitable candidate for the use of lime slurries, seven experiments were conducted on low-calcium soils in which lime slurries were compared with dry limestone. Each test site consisted of four plots with each of the following six treatments: (1) no lime, (2) 1,000 pounds per acre of lime slurry (500 pounds of actual lime), (3) 500 pounds per acre of dry, extra fine limestone, (4) slurry at a rate recommended by the Auburn Soil Testing Laboratory, (5) dry, extra fine limestone at recommended rate, and (6) agricultural grade limestone at recommended rate.

The lime slurry was applied by a commercial applicator, and the dry materials were applied with a small tractor-drawn fertilizer spreader. All were applied on turned land and incorporated into the top 3 to 4 inches of soil; Florunner peanuts were planted shortly thereafter.

Results show that recommended rates of both dry and slurry lime (1,000 pounds per acre) increased yields and/or grades in five of the seven experiments, table 10. In contrast, the slurry rate (500 pounds per acre) of lime increased yields in only two cases (sites 198 and 221) and grades in three. The determining factor in each case was lime rate and not lime source. Thus, there was no additional benefit realized by having the limestone suspended in water.

LIMING AND GYPSUM EXPERIMENTS

Although numerous experiments have demonstrated that properly applied limestone is an effective calcium source for peanuts, it is not certain that lime is always incorporated as it should be. The principle is that the incorporated limestone should be in the top 3 to 4 inches of soil during pod filling time. The limestone should, of course, contain sufficient fines to react with the acid soil and release its calcium.

Farmers usually lime their peanut fields at the convenience of lime vendors and spreaders. This may be in the fall, winter, or spring. The

TABLE 10. EFFECT OF LIME SUSPENSIONS ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Soil test		Yield per acre						Grade					
			No lime	500 lb./acre		Recommended rate[1]			No lime	500 lb./acre		Recommended rate[1]		
	pH	Ca/acre		Slurry	Dry	Slurry	Dry	Agr.		Slurry	Dry	Slurry	Dry	Agr.
		Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
D. Hartzog, Barbour County, Dothan sandy loam														
224	4.7	80	1,310	1,550	1,900	2,520*	2,220*	2,420*	46	55	53	56*	56*	59*
L. Spivey, Henry County, Faceville sandy loam														
199	5.2	110	2,150	2,310	—	—	2,960*	—	67	71	—	—	75*	—
L. Spivey, Henry County, Faceville sandy loam														
222	5.0	130	1,780	1,720	—	—	2,920*	—	68	69	—	—	69	—
M. Murphy, Henry County, Bonifay loamy sand														
197	5.4	150	3,240	3,610	3,540	3,660	3,710	3,830	74	76	75	74	75	75
D. Hartzog, Barbour County, Dothan sandy loam														
198	5.2	160	3,270	3,920*	4,210*	4,440*	4,530*	4,650*	71	77*	75*	76*	75*	76*
Parker Farms, Henry County, Esto loamy sand														
221	5.2	180	2,090	3,280*	3,980*	3,410*	3,490*	3,750*	62	70*	67*	73*	74*	73*
Parker Farms, Henry County, Esto loamy sand														
196	5.3	220	3,190	3,100	3,530	3,530	3,510	3,470	69	70	67	73	70	67

[1]Lime rate recommended by the Auburn Soil Testing Laboratory.
*Treatment different from control at 10 percent level of significance.

land preparation that follows lime spreading varies among farmers, and may not always result in lime being in the pegging zone when it is needed by the peanut. In an effort to sample the effectiveness of farmers' liming programs for peanuts, several fields were chosen that had been limed either the fall, winter, or spring before planting peanuts. Thus, soil samples prior to liming were unavailable.

Each limed test area was divided into eight plots: four received 500 pounds per acre of gypsum at early bloom and the other four received no treatment. Several varieties were grown.

Of the 13 experiments with Florunners, gypsum caused a small yield increase in two, one of which (site 287) also had higher SMK, table 11. Gypsum increased yield and SMK in 1 out of 11 Sunrunner experiments and 2 of 8 NC-7 experiments. Gypsum had no effect in a single experiment with GK-3, but increased yield in a lone experiment with GK-7.

In summary, there were yield increases from gypsum in just 6 of the 36 experiments. Since properly applied lime is a highly effective Ca source, the responses to gypsum over and above lime were probably due to inadequate lime in the pegging zone because of the method used to mix lime with the soil. The lime ended up out of reach of the pegs.

Lime versus Gypsum

To determine if limestone was as effective as gypsum as a calcium source, several experiments were conducted in which lime and gypsum were compared directly or gypsum was evaluated as a supplement to lime, table 12. In each case, lime was broadcast at 1 ton per acre on turned land and incorporated by disking into the upper 3 to 4 inches of soil just ahead of planting Florunners. Gypsum was topdressed about 60 days after planting (early bloom) in 12- to 14-inch bands over the rows at rate of 500 pounds per acre.

Yields were increased by liming in nine experiments. Of the five Ca-deficient sites where lime and gypsum were compared, lime was superior in two cases (sites 144 and 143) and equal in the others (sites 152, 125, 145). Of the eight Ca-deficient sites where gypsum was evaluated as a supplement to lime, gypsum failed to increase yield or grade in every case.

The conclusion to be reached from these experiments is that if lime at recommended rates is properly incorporated into the soil and left in the upper 3 to 4 inches during pegging time, there is no need for supplemental soluble calcium sources.

TABLE 11. EFFECT OF 500 POUNDS PER ACRE OF GYPSUM APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF PEANUTS PLANTED ON FRESHLY LIMED SOIL

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No gypsum	Gypsum	No gypsum	Gypsum
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
	Florunner variety								
262	Deal Bro.	Dale	Fuquay sl	6.4	240	3,650	4,130*	74	76
261	C. Trawick	Henry	Troup ls	5.9	380	3,770	3,470	73	73
287	H. Martin	Houston	Varina ls	6.4	460	3,100	3,570*	51	72*
317	Deal Bro.	Henry	Dothan sl	7.2	520	3,340	3,580	70	69
300	H. Lee	Pike	Wagram ls	6.0	600	4,380	4,470	73	73
288	B. Deloney, Jr.	Dale	Bonneau ls	6.5	610	3,830	3,630	75	73
260	J. Stanford	Henry	Greenville sl	6.1	620	2,640	2,650	76	75
123	L. Falkner	Henry	Norfolk sl	6.1	720	3,700	3,870	78	80
285	R. Holland	Henry	Norfolk fsl	6.4	760	4,380	4,350	73	74
258	D. Reeves	Houston	Dothan sl	6.5	940	4,250	4,000	77	76
316	Wallace Jr. College	Dale	Tifton sl	6.3	1,050	3,940	3,980	76	76
346	J. Solomon	Henry	Orangeburg sl	6.7	1,250	2,810	2,940	77	77
304	J. Bostick	Henry	Dothan sl	6.5	1,360	3,660	3,690	73	76
	Sunrunner variety								
286	H. Martin	Houston	Varina ls	6.5	460	2,760	3,250*	58	69*
290	B. Deloney, Jr.	Dale	Bonneau ls	6.3	530	3,930	3,870	74	75
318	Deal Bro.	Henry	Dothan sl	7.3	600	4,020	4,050	71	72
264	J. Stanford	Henry	Greenville sl	6.1	660	3,070	2,940	77	76
284	R. Holland	Henry	Norfolk fsl	6.3	680	4,440	4,600	73	74
265	D. Reeves	Houston	Dothan sl	6.6	770	3,680	3,730	76	76
347	Parker Farms	Henry	Tifton ls	6.2	800	3,930	3,980	74	74
315	Wallace Jr. College	Dale	Tifton sl	6.3	970	3,470	3,670	77	77
339	Wallace Jr. College	Dale	Bonifay ls	6.7	980	3,020	2,990	71	71
345	G. Whatley	Houston	Dothan sl	6.5	1,100	3,050	2,960	72	71
305	J. Bostick	Henry	Dothan sl	6.6	1,670	3,490	3,420	75	77

Continued

TABLE 11 (CONTINUED). EFFECT OF 500 POUNDS PER ACRE OF GYPSUM APPLIED AT EARLY BLOOM ON YIELD AND GRADE OF PEANUTS PLANTED ON FRESHLY LIMED SOIL

Site no.	Farmer	County	Soil type	Soil-test		Yield/acre		Grade	
				pH	Ca/acre	No gypsum	Gypsum	No gypsum	Gypsum
					Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
	NC-7 variety								
319	Deal Bro.	Henry	Dothan sl	7.3	570	3,780	3,300	58	60
289	B. Deloney, Jr.	Dale	Bonneau ls	6.3	580	2,820	3,330*	66	72*
299	H. Lee	Pike	Wagram ls	6.1	650	3,200	4,100*	61	69*
301	H. & S. Hall	Houston	Troup ls	6.4	730	4,570	4,580	66	67
267	D. Reeves	Houston	Dothan sl	6.4	800	4,100	4,050	71	72
342	Wallace Jr. College	Dale	Bonifay ls	6.4	990	2,930	3,280	63	66*
313	Wallace Jr. College	Dale	Tifton sl	6.4	1,040	4,850	4,690	72	71
348	C. Turner	Geneva	Bonifay ls	6.4	1,360	3,630	3,680	65	67
	GK-3 variety								
320	Deal Bro.	Henry	Dothan sl	7.4	650	3,940	3,820	66	61
341	Wallace Jr. College	Dale	Bonifay ls	6.4	830	3,410	3,520	62	63
	GK-7 variety								
321	Deal Bro.	Henry	Dothan sl	7.4	640	3,260	3,670*	66	70
340	Wallace Jr. College	Dale	Bonifay ls	6.6	1,130	2,960	2,720	72	72

*Treatment different at 10 percent significance level.

TABLE 12. A COMPARISON OF THE EFFECTS OF 1 TON PER ACRE OF SPRING-APPLIED LIMESTONE, 500 POUNDS PER ACRE OF EARLY-BLOOM-APPLIED GYPSUM, AND BOTH SPRING-APPLIED LIME AND EARLY-BLOOM-APPLIED GYPSUM ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test		Yield per acre				Grade			
				pH	Ca/acre	None	Lime	Gypsum	Lime + gypsum	None	Lime	Gypsum	Lime + gypsum
					Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
225	C. Trawick	Henry	Troup ls	4.8	50	710	2,390*	—	2,430*	66	70*	—	73*
144	T. Baxter	Henry	Bonifay s	5.2	80	320	2,440*	1,140*	2,250*	61	74*	73*	76*
179	J. & L. Fenn	Barbour	Cowarts ls	5.1	100	2,500	3,590*	—	3,890*	65	73*	—	71*
182	D. Hartzog	Barbour	Bonifay ls	5.2	100	2,370	3,270*	—	3,420*	63	70*	—	70*
152	J. Stanford	Henry	Lucy ls	5.2	120	1,450	1,900*	1,850*	2,200*	65	71*	71*	73*
125	W. Griffin	Coffee	Red Bay sl	4.9	130	1,780	2,580*	2,830*	—	62	71*	75*	—
143	D. Spivey	Barbour	Orangeburg ls	5.2	160	2,070	3,060*	2,510	3,140*	69	72*	75*	72*
149	Q. Brown	Barbour	Smithdale sl	4.7	190	2,220	2,180	2,350	—	72	73	74	—
145	B. Ward	Henry	Dothan sl	5.4	200	2,110	2,800*	2,460*	2,610*	68	76*	77*	78*
177	H. Adams	Barbour	Orangeburg	5.5	220	2,210	2,630*	—	2,520	68	71*	—	75*
127	J.C. Hardwick	Henry	Red Bay sl	5.5	240	2,640	2,740	2,780	—	64	67*	70*	—
126	P. Martin	Coffee	Red Bay sl	5.2	250	3,020	3,050	2,860	—	73	72	73	—
154	D. & L. Hartzog	Barbour	Red Bay sl	4.9	270	3,440	2,930	2,800	2,850	75	76	77	75
153	G. Crowley	Henry	Dothan ls	5.2	300	3,580	3,850	3,420	3,700	72	73	74	72
183	M.O. Johnson	Henry	Rumford ls	5.7	400	3,480	3,240	—	3,150	69	69	—	69
188	D. Beasley	Henry	Orangeburg sl	5.8	450	2,600	2,500	2,650	—	66	65	65	—
128	Parker Farms	Henry	Norfolk sl	5.8	680	2,500	2,420	2,360	—	76	76	75	—

*Treatment different at 10 percent significance level.

INOCULATION AND NITROGEN FERTILIZER EXPERIMENTS

Peanuts rely on nodulating rhizobia to obtain nitrogen (N) from the air and then make it available to the plant. This is a highly efficient method of obtaining N and is considerably less expensive than applying equivalent rates of commercial N fertilizers. Since there is continuing interest among growers to add fertilizer N or to introduce a superior strain of rhizobia, an effort was made to determine if more effective rhizobia were plausible for improved production. Twelve fields that were isolated from peanut production by distance or by forest or by both and where peanuts had not been grown for at least 15 to 20 years were chosen for study.

Florunner seed were inoculated at planting with a highly effective rhizobia strain and planted in four plots at each site. Another four plots were planted without the inoculum. In addition, still another four plots were fertilized with ammonium nitrate at a rate of 100 pounds per acre of N at 10 of the 12 sites. A thirteenth site compared N fertilizer with no fertilizer.

In no case did inoculation of seed affect either yield or grade of Florunners, table 13. Ammonium nitrate, on the other hand, actually lowered yield at two sites, but was without effect at the others. The results of these experiments further confirm that neither seed inoculation nor N fertilizer is needed for maximum yields.

MISCELLANEOUS FERTILIZER EXPERIMENTS

Because questions continually arise about secondary nutrients, micronutrients, and speciality fertilizers, experiments evaluating some of these have been conducted from time to time.

Micronutrient Mixture

Six fields were selected at random for evaluating a micronutrient mix containing boron, copper, manganese, molybdenum, and zinc. The mix was added beside the row soon after Florunners had emerged to a stand. The results of these experiments, reported in table 14, show no benefit in yield or grade at any site. Except for boron, micronutrients have not been found to be beneficial for peanut production in Alabama.

TABLE 13. EFFECTS OF NITROGEN (N) FERTILIZER AND SEED INOCULATION ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Yield per acre			Grade		
				None	N fertilizer	Inoculation	None	N fertilizer	Inoculation
				Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*
227	B. Deloney, Jr.	Dale	Lucy ls	2,910	2,600	3,030	71	69	71
228	B. Deloney, Jr.	Dale	Alta Vista fsl	2,600	2,620	3,130	74	71	72
234	Deal Bro.	Dale	Dothan ls	3,170	3,510	—	74	75	—
235	Deal Bro.	Dale	Dothan ls	3,930	4,340	4,210	76	77	76
236	C. Trawick	Henry	Troup ls	4,190	3,990	4,210	74	71	72
239	R. & B. Price	Pike	Lucy ls	4,040	3,930	3,760	75	74	75
240	J. & L. Harden	Pike	Red Bay ls	4,170	4,010	4,320	79	79	78
252	B. Deloney, Jr.	Dale	Dothan ls	4,740	3,880*	4,890	72	69	71
253	B. Deloney, Jr.	Dale	Gritney ls	4,620	4,580	4,730	74	73	75
254	C. Trawick	Henry	Troup ls	3,690	3,470	3,420	73	72	72
255	Deal Bro.	Dale	Lucy ls	3,890	—	4,070	75	—	75
256	Deal Bro.	Dale	Fuquay ls	2,600	—	2,410	75	—	74
257	L. Pope	Coffee	Dothan ls	2,690	2,070*	2,610	74	73	74

*Treatment different at 10 percent level of significance.

TABLE 14. EFFECT OF A MIXTURE OF MICRONUTRIENTS[1] ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil pH	Yield/acre		Grade[2]	
					None	Micro-nutrients	None	Micro-nutrients
					Lb.	*Lb.*	*Pct.*	*Pct.*
194	J.L. Falkner	Henry	Red Bay sl	5.4	4,170	4,190	66	66
213	A. Dorman	Crenshaw	Orangeburg fsl	5.6	5,140	5,220	75	76
172	J.H. Lewis	Houston	Orangeburg sl	5.8	2,070	2,150	78	79
204	M. Strickland	Crenshaw	Orangeburg sl	6.0	2,630	2,450	73	76
214	J. Luster	Crenshaw	Norfolk fsl	6.4	2,500	2,390	74	71
195	C. Turner	Geneva	Dothan ls	6.5	3,470	3,320	69	66

[1]Micronutrient rates per acre were: 10 pounds zinc sulfate, 10 pounds polybor (boron), 5 pounds manganese sulfate, 5 pounds copper sulfate, and 0.25 pound sodium molybdate.

[2]There was no incidence of hollow-heart (boron deficiency).

Boron (B) Fertilizer

Boron (B) deficiencies have been reported for peanuts in Alabama (*4*), but they are not common and have been essentially eliminated by the use of boron-containing fertilizers. Before it became almost impossible to find a B-deficient peanut field in Alabama, several experiments were conducted with B fertilizer on Florunners. Boron was added as sodium borate (20 percent B) in a preplant herbicide or in early sprays of fungicide for leafspot control. The rate was 0.5 pound of B per acre.

The symptom of B deficiency is known as "hollow-heart," an internal defect of the nut. Of the nine experiments reported here, in which soil-test B ranged from 0.032 to 0.11 pound per acre, "hollow-heart" affected 1 to 2 percent of harvested nuts in five experiments. This is high enough to cause growers to be penalized. In each case, however, a 0.5-pound rate of B completely eliminated symptoms of hollow-heart, table 15.

Previous experiments in Alabama had shown that hollow-heart was unlikely to occur unless soil-test B was less than about 0.1 pound per acre. Within the B deficiency range of this experiment, the percentage of hollow-heart did not appear to increase particularly at the lower levels of soil-test B.

"Pop-up" Fertilizer

Because early growth and yield of some crops are sometimes enhanced by "pop-up" or starter fertilizer applications on soils testing high in P and K, a single experiment was conducted with Florunners and "pop-up" fertilizer. A solution of 11-37-0 was applied in the drill at planting at a rate of 9 gallons (or 100 pounds) per acre. The results, given in table 16, show no effect on yield or grade.

Magnesium (Mg) Fertilizer

Because soils of southeastern Alabama are typically low in soil-test Mg, some believe that a Mg fertilizer would improve peanut yields in that area. However, there are no research data to support this supposition. A single experiment was conducted on a low-Mg soil in which magnesium sulfate was added at a rate to supply 50 pounds per acre of Mg. Although soil-test Mg was only 7 pounds per acre, it was clearly enough for maximum yield, table 17.

TABLE 15. EFFECT OF BORON (B) FERTILIZER ON YIELD, GRADE, AND HOLLOW-HEART OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil-test B/acre	Yield/acre		Grade		Hollow-heart	
					No B	B	No B	B	No B	B
				Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
174	B. Deloney, Jr.	Dale	Alaga ls	0.032	2,130	1,950	75	77	2.0	0.0
173	B. Deloney, Jr.	Dale	Troup ls	.034	2,030	1,850	67	64	1.0	0.0
151	B. Deloney, Jr.	Dale	Lucy ls	.036	2,740	2,750	77	78	0.0	0.0
135	T. Baxter	Henry	Bonifay ls	.040	2,400	2,150	77	75	0.0	0.0
205	B. Deloney, Jr.	Dale	Troup ls	.040	2,830	2,840	76	77	2.0	0.0
193	B. Deloney, Jr.	Dale	Troup ls	.043	2,890	3,310	73	75	2.0	0.0
216	B. Deloney, Jr.	Dale	Alaga ls	.086	2,650	2,670	73	72	0.0	0.0
211	C. Trawick	Henry	Troup ls	.090	2,610	2,570	75	75	0.0	0.0
203	J.L. Falkner	Henry	Faceville ls	.11	2,870	2,840	78	78	1.0	0.0

TABLE 16. EFFECT OF "POP-UP" FERTILIZER[1] ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil test		Yield/acre		Grade	
				P/acre	K/acre	No fertilizer	Fertilizer	No fertilizer	Fertilizer
				Lb.	*Lb.*	*Lb.*	*Lb.*	*Pct.*	*Pct.*
271	J.H. Lewis	Houston	Dothan sl	30	162	3,190	3,210	72	73

[1]Nine gallons (100 pounds) per acre of 11-37-0 in the drill.

TABLE 17. EFFECT OF MAGNESIUM (MG)[1] FERTILIZER ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Soil Mg/acre	Yield/acre		Grade	
					No Mg	Mg	No Mg	Mg
				Lb.	*Lb.*	*Lb.*	*Pct.*	*Pct.*
136	B. Deloney, Jr.	Coffee	McLaurin ls	7	2,310	2,340	71	71

[1]Magnesium sulfate to supply 50 pounds per acre Mg.

REDUCED TILLAGE EXPERIMENTS

A major potential for cost reduction in peanut production is to reduce the number of times a tractor and its equipment pass over the field. Fewer passes also lessen the likelihood of excessive soil compaction. These are the major reasons behind instituting cultivation systems known as "no till," "minimum till," or "reduced tillage." Some of these programs have been immensely successful.

Acceptance of reduced tillage systems to peanut production has been slow in developing. This was partially because peanuts need a good, firm seedbed and partially because of the belief that disease control requires the moldboard burying of crop residue, a belief that was not founded on convincing research data. However, the economical and erosion-control advantages of reduced tillage systems are so great that they should be evaluated for peanut production. That was the purpose of a project initiated in 1982, table 18.

Cooperating growers were chosen because of their interest in reduced tillage and their access to suitable equipment. Individual farms performed all production operations except harvesting and grading of the nuts. Each experiment consisted of eight plots: four

TABLE 18. EFFECT OF REDUCED TILLAGE ON YIELD AND GRADE OF FLORUNNER PEANUTS

Site no.	Farmer	County	Soil type	Yield/acre		Grade	
				Conv. tillage	Reduced tillage	Conv. tillage	Reduced tillage
				Lb.	*Lb.*	*Pct.*	*Pct.*
246	R. & B. Price	Pike	Fuquay ls	3,940	4,170	75	74
248	J. Harden	Pike	Orangeburg ls	4,200	4,860*	72	71
249	H. Lee	Pike	Norfolk sl	3,980	3,830	74	74
250	H. Lee	Pike	Norfolk ls	5,100	3,650*	74	73
251	K. Harden	Pike	Bonifay ls	4,260	4,050	75	73
276	J. Harden	Pike	Bonifay sl	5,410	5,260	72	71
277	H. Raley	Houston	Varina sl	2,800	2,600	60	59
275	G. Crowley	Houston	Dothan sl	4,860	4,220*	70	69
278	R. Holland	Henry	Lucy ls	2,220	2,540*	62	66
279	G. Croft	Henry	Fuquay ls	3,370	4,370*	69	71
311	J. Harden	Pike	Orangeburg ls	4,090	3,990	75	76
312	J. Harden	Pike	Fuquay ls	3,570	3,620	70	70
297	G. & S. Ellis	Pike	Orangeburg ls	3,870	3,660	73	71
329	B. Deloney, Jr.	Dale	Bonifay ls	3,380	2,940	78	77
330	W.O. Gulledge	Henry	Dothan sl	3,920	3,030*	73	72
331	J. Snell	Dale	Orangeburg sl	4,810	4,820	75	75
332	McKay Farms[1]	Dale	Dothan sl	3,300	2,970*	76	75
333	W.O. Gulledge[2]	Henry	Orangeburg ls	3,080	2,940	63	67*
334	W.O. Gulledge	Houston	Dothan sl	3,730	4,040	69	70
335	W.O. Gulledge[3]	Henry	Fuquay ls	2,930	2,870	72	74

[1]Planted with peanuts in grain sorghum residue.
[2]Planted with peanuts in corn residue.
[3]Planted with peanuts in soybean residue.
*Treatment different at 10 percent significance level.

were moldboard plowed and disked in a conventional manner, and the other four were seeded directly into small-grain stubble (wheat, rye, or oats) with a Brown-Harden Ro-Till® or a KMC Ripper-Planter®. No plot was cultivated after planting; weeds were controlled by herbicides.

Plots were monitored throughout the season for weed and disease infestations. Although weeds were more numerous on reduced-till plots early, they were controlled by herbicides in all cases. There was one site (site 250) in which early crabgrass control was delayed, and this apparently resulted in a lower yield for reduced tillage. There were no indications of differences in disease intensities because of tillage systems. Yields were lowered at four sites (250, 275, 330, and 332) and increased at four (247, 248, 278, and 279) by reduced tillage. One of the yield increases occurred in a field that was planted to peanuts the previous year after 35 years of bahiagrass (site 247), table 19.

Except for the severe crabgrass infestation and its delayed control at site 250, no explanation can be offered as to why yields were increased or decreased by reduced tillage. Nevertheless, these results suggest that tillage has a significant future role in peanut production.

TABLE 19. EFFECT OF REDUCED TILLAGE ON YIELD AND GRADE OF FLORUNNER PEANUTS FOLLOWING BAHIAGRASS

Site no.	Farmer	County	Soil type	Yield/acre		Grade	
				Conv. tillage	Reduced tillage	Conv. tillage	Reduced tillage
247	C. Green	Pike	Fuquay ls	4,900	5,290*	74	73
328	J.B. Beck	Houston	Ocilla sl	4,390	4,360	76	76

*Treatment different at 10 percent significance level.

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APPENDIX

SOIL-TEST VALUES OF CHECK PLOTS IN EXPERIMENTS ON FARMERS' FIELDS

Site No.	Farmer	County	Soil pH	Soil-test values (lb./acre) Ca	P	K	Mg	Year
116	B. & W. Holland	Houston	5.9	440	33	30	43	1973
117	E.E. White	Dale	6.3	410	49	19	81	1973
118	G. Crowley	Houston	5.0	210	38	110	28	1973
119	J. Senn	Pike	6.3	360	23	67	93	1973
120	W.R. Davis	Crenshaw	5.6	410	131	83	55	1973
121	W.R. Davis	Crenshaw	5.9	490	118	81	63	1973
122	J. Adams	Henry	6.2	560	49	37	104	1973
123	J.L. Falkner	Henry	6.1	720	31	95	209	1973
124	Mobley Farms	Henry	5.2	430	37	115	34	1973
125	W. Griffin	Coffee	4.9	130	47	81	15	1973
126	P. Martin	Coffee	5.2	250	61	70	12	1973
127	J.C. Hardwick	Henry	5.5	240	32	95	32	1973
128	Parker Farms	Henry	5.8	680	84	181	142	1973
129	M. Barnett	Henry	5.1	130	62	55	18	1973
130	H. Hicks	Henry	5.9	420	15	55	79	1974
131	J. Stanford	Henry	5.1	200	34	41	8	1974
132	M. Barnett	Henry	6.2	590	22	41	19	1974
133	Parker Farms	Henry	5.8	360	47	59	95	1974
134	Parker Farms	Henry	5.9	460	21	43	100	1974
135	T. Baxter	Henry	6.2	470	50	24	81	1974
136	B. Deloney, Jr.	Coffee	5.1	180	17	32	7	1974
137	J. Smith	Pike	5.3	220	48	71	40	1974
138	Q. Brown	Barbour	4.9	120	14	40	8	1974
139	J. Brown	Barbour	5.1	140	57	29	7	1974
140	S. Farmer	Henry	5.6	450	93	105	67	1974
141	W.L. Trawick	Henry	5.5	410	25	71	30	1974
142	Thomas & Hopkins	Houston	5.6	330	61	87	68	1974
143	D. Spivey	Barbour	5.2	160	17	34	11	1974
144	T. Baxter	Henry	5.2	80	43	26	8	1974
145	B.L. Ward	Henry	5.4	200	56	68	32	1974
146	T. & H. Littlefield	Houston	5.0	210	60	70	10	1975
147	B. Deloney, Jr.	Dale	5.1	150	37	55	14	1975
148	R.W. Hughes	Houston	5.3	240	49	68	18	1975
149	Q. Brown	Barbour	4.7	190	16	99	28	1975
150	J.R. Kelly	Henry	4.8	130	54	156	16	1975
151	B. Deloney Jr.	Dale	6.2	250	25	40	35	1975
152	J. Stanford	Henry	5.2	120	16	50	9	1975
153	G. Crowley	Houston	5.2	300	79	50	12	1975
154	D. & L. Hartzog	Barbour	4.9	270	28	154	38	1975
155	Fuller-Crowley	Coffee	5.6	290	16	26	42	1975
156	Parker Farms	Henry	5.8	280	61	41	49	1975
257	Parker Farms	Henry	6.3	600	49	45	62	1975
158	J. & T. Beasley	Henry	6.1	380	40	24	27	1975
159	J. & R. Taylor	Henry	5.7	420	23	43	43	1975
160	D. Nowell	Dale	5.1	290	79	87	25	1975
161	D. Beasley	Henry	5.2	320	151	83	18	1975
162	T. & H. Littlefield	Houston	4.9	230	84	132	18	1975
163	M. Griffin	Henry	5.5	280	49	120	47	1975
164	B. Lindsay	Henry	5.2	280	52	58	21	1975
165	D. & L. Hartzog	Barbour	5.2	130	29	41	18	1975
166	A. Drinkard	Pike	5.3	140	15	51	19	1975
167	G. & R. Holland	Henry	5.9	450	27	65	111	1976
168	M. Strickland	Crenshaw	5.9	720	14	54	93	1976

Continued

SOIL-TEST VALUES OF CHECK PLOTS IN EXPERIMENTS ON FARMERS' FIELDS

Site No.	Farmer	County	Soil pH	Soil-test values (lb./acre) Ca	P	K	Mg	Year
169	R. Beaty	Barbour	5.7	160	13	13	21	1976
170	R. Beaty	Barbour	5.5	180	47	11	14	1976
171	M. Trash	Pike	5.1	140	39	16	7	1976
172	J.H. Lewis	Houston	5.8	400	33	78	77	1976
173	B. Deloney, Jr.	Dale	6.3	280	25	43	37	1976
174	B. Deloney, Jr.	Dale	6.5	390	27	21	14	1976
175	H. Adams & Sons	Barbour	5.2	200	20	68	27	1976
176	F. Robinson	Henry	4.9	230	39	59	20	1976
177	H. Adams	Barbour	5.5	220	31	90	40	1976
178	M. Strickland	Crenshaw	5.1	160	14	46	24	1976
179	J. & L. Fenn	Barbour	5.1	100	42	30	11	1976
180	Golden Bros.	Henry	5.3	260	116	55	21	1976
181	D. Hartzog	Barbour	6.2	320	42	9	16	1977
182	D. Hartzog	Barbour	5.2	100	15	24	19	1977
183	M.O. Johnson	Henry	5.3	110	16	49	14	1977
184	E.E. White	Henry	5.7	420	47	66	82	1977
185	C. Weeks	Houston	5.8	440	67	48	33	1977
186	H. Lee	Pike	5.0	160	58	62	19	1977
187	M.O. Johnson	Henry	5.7	400	51	75	85	1977
188	D. Beasley	Henry	5.8	450	89	116	85	1977
189	B. Deloney, Jr.	Dale	6.2	250	9	10	48	1977
190	T. Fuquay	Barbour	6.7	590	47	36	60	1977
191	M.O. Johnson	Henry	5.1	120	17	36	11	1977
192	M. Strickland	Crenshaw	6.2	650	89	68	119	1977
193	B. Deloney, Jr.	Dale	6.4	330	11	16	71	1977
194	J.L. Falkner	Henry	5.4	320	8	62	42	1977
195	C. Turner	Geneva	6.5	1,160	19	56	91	1977
196	Parker Farms	Henry	5.3	220	—	—	—	1978
197	M. Murphy	Henry	5.4	150	—	—	—	1978
198	D. Hartzog	Barbour	5.2	160	—	—	—	1978
199	L. Spivey	Henry	5.2	110	—	—	—	1978
200	J. Best	Houston	5.3	270	14	68	49	1978
201	J.B. Beck	Houston	5.3	230	36	116	47	1978
202	B. Deloney, Jr.	Dale	5.9	220	12	9	28	1978
203	J.L. Falkner	Henry	6.0	440	61	74	77	1978
204	M. Strickland	Crenshaw	6.0	900	76	72	82	1978
205	B. Deloney, Jr.	Dale	5.9	220	12	9	28	1978
206	L. Spivey	Henry	5.7	270	15	52	75	1978
207	J. & L. Fenn	Barbour	6.0	430	29	42	57	1978
208	J.C. Caraway	Barbour	5.7	160	11	23	17	1978
209	J.L. Falkner	Henry	5.9	420	65	64	83	1978
210	B. Deloney, Jr.	Dale	5.8	220	18	18	35	1979
211	C. Trawick	Henry	5.5	190	25	13	49	1979
212	C. Trawick	Henry	5.7	240	25	34	31	1979
213	A. Dorman	Crenshaw	5.6	510	33	67	37	1979
214	J. Luster	Crenshaw	6.4	740	75	92	180	1979
215	C. Trawick	Henry	5.5	190	30	15	34	1979
216	B. Deloney, Jr.	Dale	5.8	300	24	16	31	1979
217	G. & A. Carter	Pike	4.6	70	20	25	11	1979
218	C. Trawick	Henry	5.8	100	32	32	149	1979
219	F. Newman	Henry	5.6	220	81	43	12	1979
220	White & Sowell	Henry	4.9	110	28	73	19	1979
221	Parker Farms	Henry	5.2	180	—	—	—	1979
222	L. Spivey	Henry	5.0	130	—	—	—	1979

Continued

SOIL-TEST VALUES OF CHECK PLOTS IN EXPERIMENTS ON FARMERS' FIELDS

Site No.	Farmer	County	Soil pH	Soil-test values (lb./acre) Ca	P	K	Mg	Year
223	T. Fain	Geneva	5.0	230	57	171	39	1979
224	D. Hartzog	Barbour	4.7	80	—	—	—	1979
225	C. Trawick	Henry	4.8	50	30	14	4	1979
226	S. Bradshaw	Houston	6.5	1,240	20	182	220	1980
227	B. Deloney, Jr.	Dale	6.1	490	22	81	50	1980
228	B. Deloney, Jr.	Dale	5.9	760	18	106	107	1980
229	C. Trawick	Henry	6.2	430	4	28	92	1981
230	Deal Bro.	Dale	4.9	210	4	21	13	1981
231	Deal Bro.	Dale	4.9	300	2	43	16	1981
232	R. & B. Price	Pike	5.7	340	19	45	49	1981
233	J. & L. Harden	Dale	5.7	480	31	52	95	1981
234	Deal Bro.	Dale	5.0	330	8	68	16	1981
235	Deal Bro.	Dale	5.0	350	15	45	12	1981
236	C. Trawick	Henry	5.5	250	20	47	44	1981
237	Deal Bro.	Dale	5.3	140	16	41	11	1981
238	Parker Farms	Henry	4.8	140	40	38	8	1981
239	R. & B. Price	Pike	5.7	310	39	69	55	1981
240	J. & L. Harden	Pike	5.9	470	33	55	99	1981
241	Alley	Houston	4.3	160	27	62	48	1981
242	J. Solomon	Henry	5.6	530	45	52	92	1981
243	J. Solomon	Houston	5.9	900	48	94	57	1981
244	McAllister Farms	Houston	6.0	1,030	35	56	65	1981
245	F. Britt	Coffee	5.9	1,140	123	115	99	1981
246	R. & B. Price	Pike	6.0	560	42	48	115	1982
247	C. Green	Pike	5.8	640	30	37	66	1982
248	J. Harden	Pike	6.0	590	26	46	305	1982
249	H. Lee	Pike	6.2	680	24	77	124	1982
250	H. Lee	Pike	6.0	960	161	92	104	1982
251	K, Harden	Pike	6.9	1,130	129	62	114	1982
252	B. Deloney, Jr.	Dale	5.4	230	45	85	28	1982
253	B. Deloney, Jr.	Dale	5.3	370	15	121	56	1982
254	C. Trawick	Henry	6.0	430	79	67	42	1982
255	Deal Bro.	Dale	5.8	400	8	44	62	1982
256	Deal Bro.	Dale	6.2	330	6	40	59	1982
257	L. Pope	Coffee	6.0	610	81	122	172	1982
258	D. Reeves	Houston	6.5	940	62	97	206	1982
259	Deal Bro.	Dale	5.3	190	20	27	20	1982
260	J. Stanford	Henry	6.1	620	58	131	120	1982
261	C. Trawick	Henry	5.9	380	80	57	49	1982
262	Deal Bro.	Dale	6.4	240	4	29	74	1982
263	Deal Bro.	Dale	5.4	220	20	28	22	1982
264	J. Stanford	Henry	6.1	660	53	135	113	1982
265	D. Reeves	Houston	6.6	770	63	115	181	1982
266	Deal Bro.	Dale	5.6	270	19	31	29	1982
267	D. Reeves	Houston	6.4	800	74	112	169	1982
268	M.C. Douglas	Houston	5.4	190	51	66	37	1982
269	R. Beaty	Barbour	5.5	420	55	33	79	1982
270	B. Deloney, Jr.	Dale	5.9	390	39	74	69	1982
271	J.H. Lewis	Houston	5.9	700	30	162	108	1982
272	Deal Bro.	Dale	5.0	100	19	34	9	1982
273	W. Shelley	Houston	5.9	1,180	22	86	47	1983
274	J. Burke	Barbour	6.3	860	15	40	212	1983
275	G. Crowley	Houston	6.1	1,410	80	130	113	1983
276	J. Harden	Pike	5.8	580	110	73	60	1983

Continued

SOIL-TEST VALUES OF CHECK PLOTS IN EXPERIMENTS ON FARMERS' FIELDS

Site No.	Farmer	County	Soil pH	Soil-test values (lb./acre)				Year
				Ca	P	K	Mg	
277	H. Raley	Houston	6.9	1,490	57	115	109	1983
278	R. Holland	Henry	6.4	750	83	120	114	1983
279	G. Croft	Henry	6.1	380	55	66	167	1983
280	Mobley Farms	Henry	5.3	230	26	94	20	1983
281	D. Averett	Coffee	5.9	570	82	157	53	1983
282	D. Averett	Coffee	6.1	670	42	208	83	1983
283	D. Averett	Coffee	6.1	780	44	225	105	1983
284	R. Holland	Henry	6.3	680	33	61	180	1983
285	R. Holland	Henry	6.4	760	29	65	220	1983
286	H. Martin	Houston	6.5	460	79	81	168	1983
287	H. Martin	Houston	6.4	460	79	92	159	1983
288	B. Deloney, Jr.	Dale	6.5	610	14	73	119	1983
289	B. Deloney, Jr.	Dale	6.3	580	21	80	105	1983
290	B. Deloney, Jr.	Dale	6.3	530	22	72	111	1983
291	G. Crowley	Houston	6.0	590	52	92	114	1983
292	R. & B. Price	Pike	5.3	160	46	50	22	1983
293	R. & B. Price	Pike	5.3	160	36	50	23	1983
294	R. & B. Price	Pike	5.2	160	46	50	21	1983
295	T. Beasley	Henry	6.0	340	16	49	67	1984
296	T. Beasley	Henry	6.0	390	24	40	63	1984
297	G. & S. Ellis	Pike	6.3	430	18	41	58	1984
298	McAllister Farms	Houston	6.3	720	56	47	88	1984
299	H. Lee	Pike	6.1	650	184	63	97	1984
300	H. Lee	Pike	6.0	600	181	58	88	1984
301	H.D. & S. Hall	Houston	6.4	730	39	98	86	1984
302	L. Richardson	Pike	5.9	340	24	51	88	1984
303	L. Richardson	Pike	6.0	360	25	54	97	1984
304	J. Bostick	Henry	6.5	1,360	30	190	137	1984
305	J. Bostick	Henry	6.5	1,670	28	159	109	1984
306	R. Harris	Dale	5.6	210	103	41	50	1984
307	R. Harris	Dale	5.7	240	100	39	60	1984
308	R. Harris	Dale	5.5	200	101	37	48	1984
309	G. Caylor	Coffee	6.0	490	65	73	72	1984
310	G. Caylor	Coffee	6.1	420	37	62	86	1984
311	J. Harden	Pike	6.3	720	118	65	75	1984
312	J. Harden	Pike	6.2	1,000	82	105	104	1984
313	Wallace Jr. College	Dale	6.4	1,040	44	91	355	1984
314	Wallace Jr. College	Dale	6.5	1,030	37	217	328	1984
315	Wallace Jr. College	Dale	6.3	970	42	105	365	1984
316	Wallace Jr. College	Dale	6.3	1,050	42	105	166	1984
317	Deal Bro.	Henry	7.2	520	9	44	124	1985
318	Deal Bro.	Henry	7.3	600	6	63	160	1985
319	Deal Bro.	Henry	7.3	570	13	38	143	1985
320	Deal Bro.	Henry	7.4	650	5	63	184	1985
321	Deal Bro.	Henry	7.4	640	6	56	180	1985
322	D. Hartzog	Barbour	5.9	310	30	51	44	1985
323	D. Hartzog	Barbour	6.0	390	28	79	55	1985
324	D. Hartzog	Barbour	6.0	410	24	76	58	1985
325	B. Deloney, Jr.	Dale	6.4	1,030	32	97	116	1985
326	B. Deloney, Jr.	Dale	6.5	1,000	30	106	119	1985
327	McAllister Farms	Houston	6.6	790	66	83	142	1985
328	J.B. Beck	Houston	6.2	1,030	54	77	199	1985
329	B. Deloney, Jr.	Dale	5.9	586	46	79	43	1985
330	W.O. Gulledge	Henry	5.7	450	17	117	100	1985

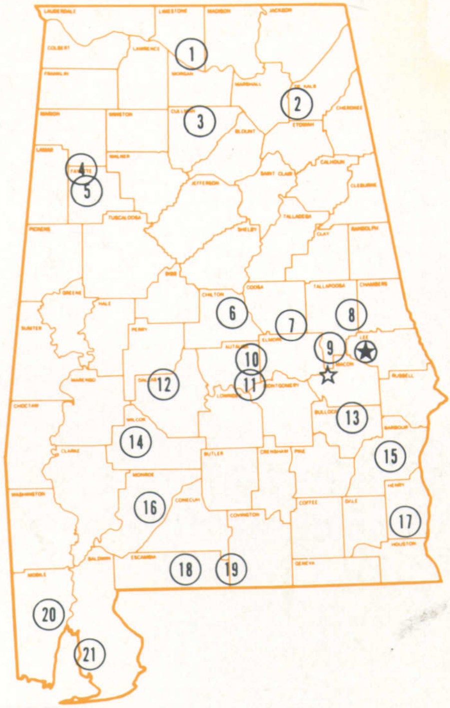
Continued

SOIL-TEST VALUES OF CHECK PLOTS IN EXPERIMENTS ON FARMERS' FIELDS

Site No.	Farmer	County	Soil pH	Soil-test values (lb./acre)				Year
				Ca	P	K	Mg	
331	J. Snell	Dale	5.9	550	71	156	105	1985
332	McKay Farms	Dale	6.2	610	47	81	139	1986
333	W.O. Gulledge	Henry	6.0	670	28	126	131	1986
334	W.O. Gulledge	Houston	6.3	810	63	91	107	1986
335	W.O. Gulledge	Henry	6.1	490	43	81	191	1986
336	B.W. Danzey	Henry	6.1	950	17	241	183	1986
337	D. Hartzog	Barbour	6.2	390	4	28	46	1986
338	Wallace Jr. College	Dale	6.0	480	49	80	62	1986
339	Wallace Jr. College	Dale	6.7	980	33	216	95	1986
340	Wallace Jr. College	Dale	6.6	1,130	42	181	72	1986
341	Wallace Jr. College	Dale	6.4	830	39	169	73	1986
342	Wallace Jr. College	Dale	6.4	990	39	138	67	1986
343	D. Hartzog	Barbour	6.1	250	9	34	50	1986
344	D. Hartzog	Barbour	6.1	330	14	40	56	1986
345	G. Whatley	Houston	6.5	1,100	103	165	158	1986
346	J. Solomon	Henry	6.7	1,250	22	234	163	1986
347	Parker Farms	Henry	6.2	800	37	135	59	1986
348	C. Turner	Geneva	6.4	1,360	23	73	75	1986
349	Falkner Farms	Henry	6.1	460	33	104	88	1986

Alabama's Agricultural Experiment Station System
AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

⊛ Main Agricultural Experiment Station, Auburn.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Chilton Area Horticulture Substation, Clanton.
7. Forestry Unit, Coosa County.
8. Piedmont Substation, Camp Hill.
9. Plant Breeding Unit, Tallassee.
10. Forestry Unit, Autauga County.
11. Prattville Experiment Field, Prattville.
12. Black Belt Substation, Marion Junction.
13. The Turnipseed-Ikenberry Place, Union Springs.
14. Lower Coastal Plain Substation, Camden.
15. Forestry Unit, Barbour County.
16. Monroeville Experiment Field, Monroeville.
17. Wiregrass Substation, Headland.
18. Brewton Experiment Field, Brewton.
19. Solon Dixon Forestry Education Center, Covington and Escambia counties.
20. Ornamental Horticulture Substation, Spring Hill.
21. Gulf Coast Substation, Fairhope.