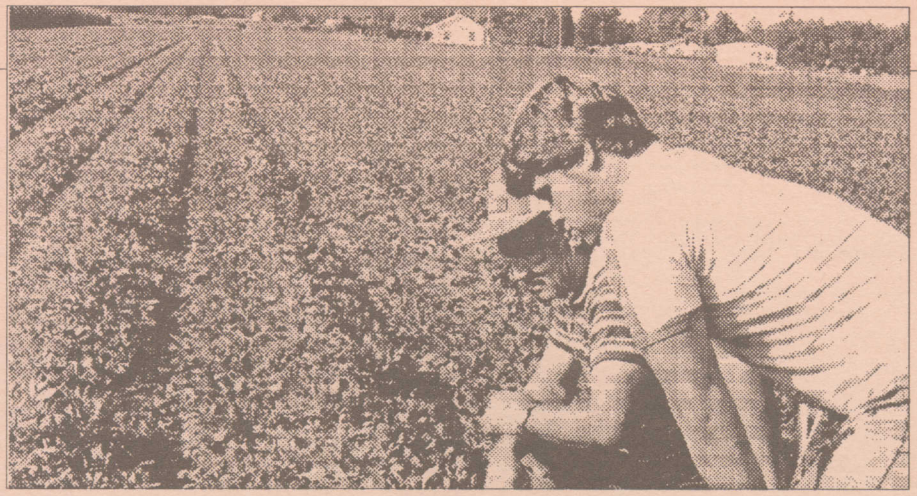

Research Update 1991

Peanuts

Rotations for Improved Peanut Production

Results following 3 years of rotation with peanuts clearly illustrate the benefits of corn and bahiagrass in improving peanut yields. While nonrotated peanuts yielded 2,700 pounds per acre, rotation with, 1 year of corn or bahiagrass pushed yields to 3,200 and with 2 years of bahia improved yields to 3,700 pounds per acre.

These yield increases were not the result of white mold control. Results indicate that 1- and 2-year rotations did not reduce severity of this disease.

One and 2-year rotations did reduce damage from nematodes and leafspot, making the peanuts more rank and apparently more susceptible to white mold damage. The addition of Folicur fungicide (two applications during the season) reduced white mold by 75-80 percent, reduced limb rot, and increased yields from 600 to 1,200 pounds per acre.

P.A. Backman, J. Jacobi, D. Davis, and R. Rodriguez-Kabana

New Herbicide Systems Doing the Job on Weeds

For many years peanut growers used the so called "Cadillac Treatment," the primary components being dinoseb and alachlor, to control weeds. The loss of dinoseb-containing herbicides in 1986 eliminated one component of the system, and the loss of alachlor (Lasso®) may occur in the future.

Fortunately, several new products, such as Gramoxone®, Classic®, and Basagran® appear at this time to be adequate replacements. And, a new herbicide, Pursuit®, if it acquires expected Federal registration this year, will provide even greater flexibility in weed control in the Southeast.

For the past few years, AAES researchers have evaluated tank mixes containing Gramoxone for weed control in peanuts. The most successful additives for Gramoxone are 2,4-DB and Basagran. Both of these herbicides tend to improve weed control relative to either material applied alone.

Basagran tends to inhibit the penetration of Gramoxone into the foliage of the treated plants, resulting in less injury to the peanut plant; hence Basagran is perceived as a "safener" for Gramoxone. However, this antagonism also occurs with some weeds, and, depending upon the species of weed in question, control can be reduced. Likewise, some species, such as prickly sida and morningglory, are more sensitive to Basagran than to Gramoxone, and with these

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Effect of Gypsum on Peanut Yield

Calcium is the plant nutrient most often associated with limiting peanut production. In nine on-farm experiments, conducted in 1987 and 1988, gypsum provided several positive effects on yield and quality of Florunner, GK 7, Sunrunner, and Southern Runner peanut varieties.

Peanut yields for all varieties were significantly increased with gypsum addition at two locations (3 and 4) in 1987 and one location (3) in 1988, table 1. This was expected since the soil

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Alabama Agricultural Experiment Station Auburn University
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Effect of Gypsum, continued

Ca ranged between 196 and 214 pounds per acre for the variety check plots at these sites, table 2. Previous research defined the soil test Ca level needed for maximum yield of Florunner to be 250 pounds per acre. Therefore, increased yields were expected for Florunner, if soil test Ca was below this level, as was the case for sites 3 and 4 for 1987 and site 3 in 1988. Since all the varieties tested were runner type peanuts, they were expected to respond similarly. There was only one instance in which yield was increased by gypsum when the check plot soil test Ca level was above 250 pounds per acre (GK-7 had an increase of 438 pounds per acre at site 5 in 1987). It should be noted that GK-7 failed to show a yield increase when soil Ca was 384 pounds per acre at another location (site 2, 1988).

Relative yields of the check plots were determined by dividing the check plot yield by the treatment yield. Then yields were regressed against soil test Ca values to determine if the varieties tested required different soil Ca levels to produce maximum yield. Regression analyses determined that maximum yield for Florunner was reached at 250 pounds per acre of soil Ca, which is identical to the critical value found in previous AAES research.

Table 1. Effect of 500 Pounds Per Acre of Gypsum Topdressed at Early Bloom on Yield Per Acre for Four Peanut Varieties at Nine Locations, 1987 and 1988

Site/year	Florunner		Sunrunner		GK-7		Southern R	
	No gyp	Gyp	No gyp	Gyp	No gyp	Gyp	No gyp	Gyp
	Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*
1987								
1	1,820	2,020	2,010	1,680	1,820	1,590	2,240	2,150
2	3,290	3,070	3,290	2,820	3,050	3,080	3,020	2,900
3	2,640	3,570	540	2,040	310	2,380	1,150	3,000
4	2,190	3,130	2,100	2,890	1,760	2,970	1,120	2,760
5			3,190	3,290	2,860	3,810	2,860	3,330
1988								
1	2,650	2,660	3,270	3,060	2,510	2,370	2,840	2,840
2	3,450	3,380	3,240	2,860	3,130	2,960	3,480	3,340
3	3,110	3,580	4,040	4,380	3,290	3,760	3,270	4,210
4	3,180	3,420	3,620	3,880	3,550	3,450	3,110	3,240

All other varieties tested required a somewhat higher soil Ca level than Florunner to produce maximum yield.

Maximum yields for Sunrunner, GK-7, and Southern Runner were obtained at 286, 366, and 286 pounds per acre of soil Ca, respectively. These values may be subject to error since there were few Ca deficient sites.

Table 2. Fall Soil-test Values Per Acre for Check Plots From the Nine On-Farm Experiments

Site/year	pH	Ca	P	K	Mg
	Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*
1987					
1	6.1	402	91	71	93
2	6.2	429	30	136	148
3	5.2	196	60	89	15
4	5.5	214	22	52	30
5	6.0	38	80	60	78
1988					
1	6.4	616	20	82	143
2	6.0	384	53	111	102
3	5.4	196	12	20	16
4	6.2	473	24	92	104

There were differences in yield among the varieties on the treated plots, but no variety consistently yielded the most or the least across the field experiments. For example, at site 1 in 1987, Southern Runner had the highest yield, but at site 4 in 1988 it had the lowest yield. Thus, no variety consistently outperformed the other varieties.

Percentage of sound mature kernels (SMK) was generally increased by gypsum addition at the same sites as yield. Only Florunner and GK-7 at site 3 in 1988 failed to show an increase in SMK concomitant with a yield increase. The GK-7 variety showed an increase in SMK on four "high Ca" sites, indicating the possibility of a higher calcium requirement for GK-7 to achieve maximum SMK than for the other varieties.

J.F. Adams and D.L. Hartzog

New Herbicides, continued

weeds the tank mix has been more effective in AAES tests.

It appears that growers will reduce their reliance on Lasso in the coming growing season. Lasso has been widely used for its control of Florida beggarweed, however AAES research has shown that satisfactory control of this weed can be achieved through early season applications of Gramoxone, and/or later season applications of the recently registered herbicide Classic.

G.R. Wehtje

Tomato Spotted Wilt Virus Stable in Alabama Peanuts

Tomato spotted wilt virus (TSWV), which was first found in Alabama's peanut crop in 1986, has caused serious crop loss in other peanut-producing states. Most recently, peanuts in Georgia and Mississippi were heavily damaged by TSWV. So far, Alabama Experiment Station field surveys indicate that this disease has had little impact on peanut production in Alabama.

In each peanut-producing county, one field for each 5,000 acres of peanuts, with a three field minimum for each county, was checked each year. A total of 80 to 85 fields was surveyed annually from 1987 to 1990. In

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Seed Size Not Correlated to Herbicide Damage

It has been widely accepted that small seed produce smaller plants, and these plants are inherently more easily injured by herbicides. Tests were established to examine this idea using small, medium, and large seed. Herbicide treatments ranged from none to systems considered to be fairly injurious to peanuts, such as paraquat applied twice within a short time period. This test was conducted at the Wiregrass Substation, Headland, and at Jay, Florida.

A summary of the data shown in the table reveals that progressively larger seed results in a stepwise increase in yield, however the overall difference is not great. None of the treatments were particularly injurious to the crop; however, as expected, paraquat applied twice resulted in the least yield.

There was no treatment by seed size interaction, meaning that none of the seed sizes were any better able to handle the herbicide-induced stress.

Conversely, none of the seed sizes were uniquely disadvantaged when it came to tolerating excessive levels of herbicides. Large seed simply produce larger plants, so the net affect is similar to having an earlier planting date.

G.R. Wehtje

Peanut Yield as Influenced by Seed Size and Herbicides, Average Over All Locations and Years

Herbicide, lb./acre	Yield per acre by seed size			
	Small	Medium	Large	Mean
	Lb.	*Lb.*	*Lb.*	*Lb.*
Paraquat, 0.13	4,010	4,020	4,260	4,100
Paraquat, 0.25	3,850	3,880	4,010	3,910
Paraquat-twice, 0.13	3,510	3,930	3,710	3,720
Paraquat + alachlor, 0.13 + 3	3,870	4,380	4,310	4,190
Paraquat + alachlor, 0.26 + 3	3,790	4,090	4,190	4,030
Untreated	3,830	4,220	4,180	4,070
Mean	3,810	4,080	4,110	

Tomato Spotted Wilt Virus, continued

each field, plants with typical TSWV symptoms were counted in five randomly selected areas. Each area was two adjacent rows 100 feet in length for a total of 1,000 row feet per field. Stand density in each field also was estimated in order to calculate the percentage of TSWV-infected plants.

Incidence of Tomato Spotted Wilt Virus in 80-85 Surveyed Fields, 1987-90

Year	Fields with diseased plants	Incidence of diseased plants	
		Range	Mean
	Pct.	*Pct.*	*Pct.*
1986	94	0 - 3.1	0.49
1987	41	0 - 0.3	0.02
1988	90	0 - 1.6	0.19
1989	92	0 - 2.3	0.21
1990	87	0 - 1.4	0.20

TSWV is well established throughout Alabama's peanut belt. With the exception of 1987, when virus-infected peanuts were seen in only 41 percent of fields, TSWV has been found in approximately 90 percent of fields surveyed. As noted in the table, highest levels of this disease were seen in 1986, while the incidence of TSWV-infected peanuts was lowest in 1987. Over the past 3 years, mean disease incidence across Alabama has held steady at 0.2 percent. In any single field over the 5-year survey period, only 3.1 percent of plants examined showed typical TSWV symptoms. Recently in most fields, the incidence of diseased plants was less than 0.5 percent. Late summer droughts, which severely damaged dryland peanuts in several counties, probably interfered with identification of virus-infected plants.

A.K. Hagan, J.R. Weeks, J.C.French, and R.T. Gudauskas

LCB Damage Higher In Late Planted Peanuts

In a 2-year test at the Wiregrass Substation, Headland, lesser cornstalk borer abundance was greater in peanuts planted in May than in June. However, tillage system and burning stubble had little effect on abundance of this insect.

Two planting dates (mid-May and early June) and three tillage systems (conventional, reduced, and burned stubble) were used in the test. The reduced tillage treatment was included because it usually decreases soil temperatures, so it should slow the development of the lesser cornstalk borer.

Wheat stubble was burned in some plots because the foreign literature indicates that lesser cornstalk borer adults are attracted to burned stubble, and because burning stubble prior to planting is a common practice in the Wiregrass region of Alabama. The abundance of lesser cornstalk borers was monitored weekly with pitfall traps.

Lesser cornstalk borer abundance varied with year, with more insects occurring in 1986 than in 1987. About 1.9-fold more lesser cornstalk borers were captured in traps in late-planted

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TSWV Vectors Fluctuate During Growing Season

Tobacco thrips and western flower thrips, two of five species known to vector tomato spotted wilt virus (TSWV) in peanuts, have commonly occurred in field samples taken in Alabama since 1987. Tobacco thrips consistently was the most abundant species found (see table). Western flower thrips was not known to infest Alabama fields prior to 1987.

Since tobacco and western flower thrips have been the most abundant species found in weekly samples, the potential exists for significant spread of TSWV. However, results indicate thrips populations peak 2-4 weeks after peanut emergence and decline sharply after 6 weeks. Based on early TSWV infection, 1 percent or less of thrips migrating into peanut fields caused the initial infection levels found in peanuts in early June.

AAES tests were conducted at the Wiregrass Substation, Headland, and at three grower sites. Five samples were taken from each plot and five peanut terminals were taken from each sample. These terminals were washed in an alcohol solution and thrips were filtered out and counted.

Thrips damage to peanuts is characterized by feeding in the unfolded new leaves. This causes scarred, deformed leaves, resulting in stunted peanut leaves.

Insecticide treatments also are being evaluated for control of thrips and subsequent effect on TSWV. Tests were conducted in 1988 and 1990 to evaluate the efficacy of in-furrow applied insecticides and foliar sprays to control thrips. Although most treatments reduced thrips populations, this reduction had no significant effect on the level of TSWV found in those plots. Since TSWV infection levels have remained below 5 percent each year since 1986 in Alabama peanuts, there appears to be no economic benefit to using supplemental applications of insecticides to reduce thrips populations.

J.R. Weeks

Thrips Species Found in Peanut Field Surveys, Wiregrass Substation and Growers Fields

Date	Total thrips/5 blooms	Tobacco thrips	Western flower thrips	Other non-vectors
	No.	*Pct.*	*Pct.*	*Pct.*
5/15	7.0	69	28	3
5/23	3.6	86	13	1
5/30	5.0	80	18	2
6/6	34.0	69	25	6
6/13	9.0	62	27	11
6/20	7.7	65	14	21
6/27	14.5	64	6	30
7/6	10.7	50	9	41
7/12	15.3	71	7	22
7/19	30.0	88	4	8
7/26	21.0	93	3	4

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LCB Damage, continued

peanuts in both years. Tillage system did not affect the abundance of lesser cornstalk borers in either year, so burning stubble did not increase the number of lesser cornstalk borers in this test. Planting peanuts in May and not in June should effectively decrease lesser cornstalk borer abundance in conventionally tilled and reduced tillage peanuts.

T.P. Mack and C.B. Backman

EDITOR'S NOTE

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