Research Update 1992

Peanuts

White Mold Affected by Crop Rotation

Crop rotation has always been among the most effective tools for managing disease and nematode pests of peanuts. Information on the value of crop rotation in fighting peanut diseases, particularly white mold, was gathered in tests on 16 Alabama farms in 1991. Fields, selected on the basis of past cropping history, fell into one of the following categories: poor - 3 or more years continuous peanut production, including unplowed summer fallow; average - 1 year peanuts behind 1 year of another crop or clean summer fallow; good - 2 or more years between peanut crops; best - peanuts following bahiagrass pasture. White mold damage was assessed in plots within 2 days of digging and yields were taken.

As expected, the least white mold damage was seen in the best rotation category where peanuts followed bahiagrass pasture, see table. Numbers of white mold hits in these fields was only about 4 percent of those found in fields in the average rotation category. White mold was much more common than expected in those fields in a good rotation. Fields in the average category where peanuts were grown every second year suffered the heaviest white mold damage. In one field, nearly 28 percent of the plants in the untreated control plots were killed by the white mold fungus before harvest. Surprisingly, fields in continuous peanut production suffered no more white mold damage than fields in the good rotation category.

Yields were not closely tied to the level of white mold damage, see table. Highest yield was recorded in fields in the best or bahiagrass rotation. Despite considerable differences in white mold damage, yield of peanuts in the good and average rotations was roughly the same. Root-knot nematodes, not white mold, were largely responsible for the poorer yields seen in the non rotated peanuts. Root-knot nematodes did not substantially reduce yield in the other three rotation categories.

The occurrence of Rhizoctonia limb rot was not affected by crop rotation. Minor limb damage was seen in at least one field in all but the poor rotation categories. The impact of Rhizoctonia limb rot on yield was minimal, when compared to white mold, in the fields checked in 1991.

A.K. Hagan, J.R. Weeks, and K.L. Bowen

Impact of Crop Rotation on the Occurrence of White Mold and Yield of Peanut in 1991

Rotation	White mold hits #/100 ft.	Yield
		Lb./a
Poor	5.8	3,222
Average	13.0	3,608
Good	5.6	3,692
Best	0.3	3,859

Submodel of AU Pnuts Effective in Disease Forecasting

Research on the disease control submodel of AU-Pnuts, a peanut pest control model, began in 1989, but only in one location. A direct comparison was made to the Envirocaster computerized predictor and to the standard 14-day program commonly used by growers. In the original test, the spray program started at initial signs of disease, with subsequent applications made when three rainfall events (of 0.1-inch or more) were recorded or predicted following a protection period of 10 days. The AU-Pnuts model, disease submodel, as it was called, outperformed the Envirocaster and the 14-day program on both Florunner and Southern Runner cultivars. AU Pnuts used one spray less than the 14 day program, and one spray more than the Envirocaster.

During the very rainy year of 1991, trials were conducted on nonrotated and rotated Florunner and Southern Runner peanuts. Again, the Auburn model saved one to two sprays with improved disease control and in this particular season, it improved yields over the 14-day program. These tests validated the fact that the AU model was just about right with the rules developed for its disease submodel and

continued on page 2

Alabama Agricultural Experiment Station Auburn University
Lowell T. Frobish, Director Auburn University, Alabama

Vacuum Seeder Has Little Impact On Peanut Yields

In 1991, weed scientists at Auburn compared the planting accuracy of a new air, or vacuum, planter to a traditional planter. This was done at standard (90 to 110 pounds per acre), marginal, and substandard seeding rates. The intent was to determine if the reported extra accuracy of the air planter would allow for a reduction in seeding rate. Both planters were adjusted by AAES personnel to meet manufacturers specifications to achieve desired seeding rate. The exact spacing between individual seedlings was determined soon after crop emergence and yield data was taken at harvest.

At a standard seeding rate, both planters were equally successful in getting most of the seedlings spaced out very close to the (theoretical) perfect spacing. As seeding rate decreased, spacing variation tended to increase, and below 70 pounds of seed per acre the variation in spacing increased dramatically. Apparently at these lower seeding rates, there are insufficient seedlings to "crack open" the soil, thus a portion of seeds that have germinated never emerge.

Across all seeding rates, the variation in seedling spacing was about equal between the two types of planters. Yield was influenced by seeding rate, in that yields decreased when seeding rates dropped below 90 pounds per acre. However, this trend was identical for both planters. Yield was not influenced by planter. Due to less than 100 percent seed germination and seedling losses due to disease and other pests, there will always be some variation in stand uniformity, and no modification in planter design is likely to completely eliminate this variation.

These results are based on 1 year's results. The tests well be repeated in the 1992 growing season.

G.R. Wehtje

Tillage for Peanuts Following Bahiagrass

Acreage for peanut-bahiagrass rotations have increased throughout the Wiregrass. Research conducted by the Alabama Agricultural Experiment Station has shown the beneficial effects of bahiagrass rotations. Nematodes and soilborne diseases are drastically reduced and root restricting layers, such as plowpans, are penetrated by bahiagrass roots and thus left more permeable for the following crop.

Two on-farm experiments were established in Henry County in fields in which bahiagrass was grown for five consecutive years. In the late fall and early spring, test areas were sprayed with Roundup® to kill bahiagrass. Treatments consisted of conventional (disk, moldboard, disk, and disk), two diskings, and rototilling. The rototiller had tines removed so that only 1-foot-wide strips were tilled. Two planters, centered over the tilled strips, were attached to the rototiller. Thus, only one pass was necessary with the rototilled treatment.

The first experiment indicated rototilled strips gave lower yields than conventional tillage or disking. In all tillage treatments, sound mature kernels (SMK) were not different. Also soil test values for the check plots (no gypsum) were not different and no nutrients were determined as deficient.

In 1990, the results were different from the first experiment. The disked and rototilled strips had equally high yields while the conventional tilled treatment produced the lowest yield. In the disked and rototilled treatments, the addition of calcium, as gypsum, did not increase yield or SMK, but gypsum did increase yield in the conventional tillage treatment.

continued on page 3

TILLAGE EFFECTS ON PEANUT YIELD AND GRADE FOLLOWING BAHIAGRASS

	Conventional		Disk		Rototilled	
	No Gyp	Gyp	No Gyp	Gyp	No Gyp	Gyp
Yield per acre, lbs.						
Experiment 1	4,280	4,150	4,080	3,990	3,640	3,690
Experiment 2	1,150	3,045	3,525	4,080	3,760	3,710
Sound mature kernels, pct.						
Experiment 1	77	78	78	78	77	76
Experiment 2	74	74	74	73	74	73

Submodel of AU Pnuts, continued

no corrections were needed. A second result of the 1991 season was that the rules used with the disease submodel were capable of controlling an early leafspot epidemic (most 1991 fields were predominately affected by early leafspot while previous years were dominated by late leafspot).

Ten grower trials were conducted during 1991 in five Alabama counties. These trials were supported by the National Weather Service, which provided a special 5-day forecast. This information was transferred to growers via a toll-free telephone number. In these trials the two most frequently encountered problems involved failure to initiate the AU-Pnuts program when sprays were called for and spraying too close to harvest when a spray was not indicated.

Growers planting in April often had to spray as early as 23-26 days into the season because of frequent spring rains. Often growers did not believe the program, and would delay initiation. Additionally, three of the 10 growers used an unnecessary spray at the end of the season.

Even with errors, seven of the 10 growers did better than the 14-day program with AU-Pnuts, two did about the same, and in one case the conventional was better (this grower, however, made several major deviations from AU-Pnuts). Total fungicide applications were reduced only by about 1/2 spray each for the 10 growers, and that only if the three unnecessary end-of-season sprays are removed.

P. A. Backman

New Fungicide Performs Better On Most Common Peanut Rotations

A recent survey of Alabama peanut growers indicates that a majority use crop rotations considered to be poor to fair by the Alabama Cooperative Extension Service. Only about 5 percent used a good rotation and only 1.5 percent used the best rotation (peanuts behind bahiagrass), as shown in table 1. Nematode damage and leafspot defoliation generally got worse as the frequency of peanut production increased, table 2.

Using these same rotations, researchers found that Moncut®, an experimental fungicide with excellent activity on white mold and Rhizoctonia-related diseases of peanuts, increased yield more in fields kept in poor and fair rotations than in those in which good and best rotations were followed. In a peanut-corn-peanut rotation, which was considered fair, one application of Moncut increased peanut yields in two fields severely damaged by white mold by 1,700 pounds. However, yield gains were much lower in fields with light white mold pressure. Peanuts in poor rotations (continuous peanuts) showed little yield response to Moncut, due to surprisingly low white mold damage.

Moncut is not labeled for use on peanuts. If the product were available, and performed at the levels recorded in the 1991 tests, it would increase the value of Alabama's peanut crop dramatically, but this improvement would be heavily dependent on the rotation, according to the Auburn tests. If this product, and similar fungicides now in development, were labeled and used on every peanut acre in the State in which poor to fair rotations are used, it is projected that it would increase the dollar value of Alabama's crop by $24 million.

Table 1. Classification of Peanut Rotations Used by Alabama Farmers

Best rotation = longterm pasture, followed by peanuts
Good rotation = 2 to 3 years of cotton or corn, followed by peanuts
Fair rotation = 1 year of cotton or corn, followed by peanuts
Poor rotation = peanuts followed by peanuts

Table 2. Effect of Peanut Rotations on Leafspot Defoliation and Nematode Populations

Rotation	Rootknot No./100 cc of soil	Leafspot defoliation
		Pct.
Longterm bahiagrass + peanuts	5.5	65.1*
Cotton + cotton + peanuts	0.0	30.0
Peanuts + corn + peanuts	10.6	35.0
Peanuts + peanuts	1,521	41.5

* High due to defoliation by velvetbean caterpillars

A.K. Hagan

Predicting LCB Larval Numbers From Adult Flush Counts

Lesser cornstalk borers (LCB) are an economic pest of a number of crops, including peanuts, in the Southeast. Population outbreaks typically occur in hot, dry years, and in peanuts grown in well-drained soils. Yield losses in peanuts can exceed 70 percent in severe outbreaks, and predicting such outbreaks would provide a valuable management tool for Alabama growers.

It is the larval stage of the LCB that causes feeding damage on peanuts. However, sampling for LCB larvae is a time consuming and laborious process, because the larvae are underground. Adult lesser cornstalk borers are small moths that rest on peanut foliage or on the soil surface, making them much easier to sample. Estimating the abundance of crop-damaging larvae by sampling adults would be a valuable tool for both researchers and growers, and recent AAES tests indicate this is possible.

The abundance of larvae and adults of lesser cornstalk borers was monitored in conventionally tilled and planted Florunner peanuts for 3 years at the Wiregrass Substation in Head-

continued on page 4

Tillage for Peanuts, continued

If soil-test calcium is less than 300 pounds per acre, yield increases can be expected with supplemental calcium applications. Soil-test data showed that the check plots had 160, 310, and 320 pounds per acre of calcium for conventional, disked, and rototilled treatments, respectively. This supports the idea that the moldboard plow turned the soil, in which calcium was accumulated in the top few inches, to depths beyond that of the pegging zone of peanuts. Plowing also brought to the surface calcium deficient soil that required supplemental calcium. This shows that tillage can be a factor in maintaining soil calcium within the pegging zone.

Both experiments showed that disking bahiagrass resulted in high yields. Planting in the disked area was not hindered by excess sod or clods since bahiagrass had been sprayed with Roundup the previous fall and again that spring. On the other hand, the appearance of the field was not as nice as the conventional tillage. Of all the treatments, the biggest problem was evident during the digging of the rototilled treatment. Tractor speed must be slower and plow points on the digger were subject to damage going through soil between the tilled strips for the rototilled treatment.

J.F. Adams and D.L. Hartzog

land. Larval abundance was monitored by weekly soil sieving throughout the growing season. The abundance of adults was monitored weekly by flushing moths from rows. Regression was used to determine if adults in week "i" can explain the variation in larval abundance in week "i + 1", over the 3 years of observation. The mean number of larvae from week "i + 1" increased linearly with an increase in adult flush counts from week "i", indicating that larval density could be predicted by adult abundance. The resulting equation indicated that about 13 larvae per yard can be expected to be found 1 week later for each adult per yard flushed.

This equation could be a significant addition to management of the lesser cornstalk borer, because the use of adult flush counts allows for the prediction of damaging and difficult-to-sample larval populations before they occur.

T.P. Mack

New Herbicide Effective on Hard-to-Control Peanut Weeds

Pursuit®, a new herbicide from American Cyanamid, made its debut in peanuts in 1991. This herbicide can be applied either to the soil (preemergence through ground cracking) or postemergence. It offers control of several weeds, such as bristly starbur, coffee senna, small flower morningglory, and both yellow and purple nutsedge, which are only marginally controlled with other herbicides registered for use on peanuts.

In evaluation trials in 1991 by the Alabama Agricultural Experiment Station, one herbicide program that performed well was a treatment of paraquat plus Pursuit (0.032 pounds per acre) applied at ground cracking, followed by a postemergence treatment of paraquat plus 2, 4-DB plus Basagran®. This program provided a good balance between the economy of the older herbicides and the efficacy of this new material.

Another Pursuit-like herbicide, called Cadre®, is also under development by American Cyanamid, and is being tested by the AAES. It appears to be similar to Pursuit, but it is much more active on Florida beggarweed. Cadre is expected to be registered in 1993 or 1994.

G.R. Wehtje

March 1992 4 M

EDITOR'S NOTE

Mention of company or trade names does not indicate endorsement by the Alabama Agricultural Experiment Station or Auburn University of one brand over another. Any mention of nonlabel uses or applications in excess of labeled rates of pesticides or other chemicals does not constitute a recommendation. Such use in research is simply part of the scientific investigation necessary to fully evaluate materials and treatments.

Information contained herein is available to all persons without regard to race, color, sex, or national origin.

Editor's Note: Please use the form below to send the name and address of any neighbor or friend who should receive the report. If you do not wish to receive future issues, please indicate that fact on the form and we will remove your name from the mailing list.

❑ **Add the following name to receive the AAES Peanut Update.**
❑ **Remove the following name from the mailing list for the AAES Peanut Update.**

Name

Street, Box, or Route No.

City **State** **Zip**

Alabama Agricultural Experiment Station
Auburn University
Auburn University, Alabama 36849-0520

NON-PROFIT ORG.
POSTAGE & FEES
PAID PERMIT NO.9
AUBURN, ALA.

Address Correction Requested