Peanut Disease Control Field Trials, 2010: Standard Fungicide Trials

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Peanut Disease Control Field Trials, 2010 Standard Fungicide Trials

A. K. Hagan, K. L. Bowen, and H. L. Campbell

INTRODUCTION

Fungicides, cultural practices, and resistant cultivars are available for the control of damaging diseases and nematode pests that can limit peanut yield. A management program that incorporates these practices can enhance the control of diseases and nematode pests and can increase crop yield and profit potential.

In order to provide timely information concerning disease management practices, Alabama Agricultural Experiment Station personnel conducted foliar and soil-borne disease as well as nematode control trials at the Wiregrass Research and Extension Center (WREC) in Headland, Alabama; the Gulf Coast Research and Extension Center (GCREC) in Fairhope, Alabama; the E. V. Smith Research Center, Plant Breeding Unit (PBU) in Tallassee, Alabama; and the Brewton Agricultural Research Unit (BARU) in Brewton, Alabama. This report summarizes the results of those trials.

During the 2010 production season at the WREC, temperatures were near to above normal historical averages (Figure 1), and monthly rainfall totals were at or below normal historical averages throughout the entire growing season (Figure 2). As a result of the less than normal rainfall, leaf spot severity in all trials was not as severe as previously observed in all trials, and due to higher soil temperatures soil-borne disease incidence was higher than that observed in previous years and adversely affected yield.

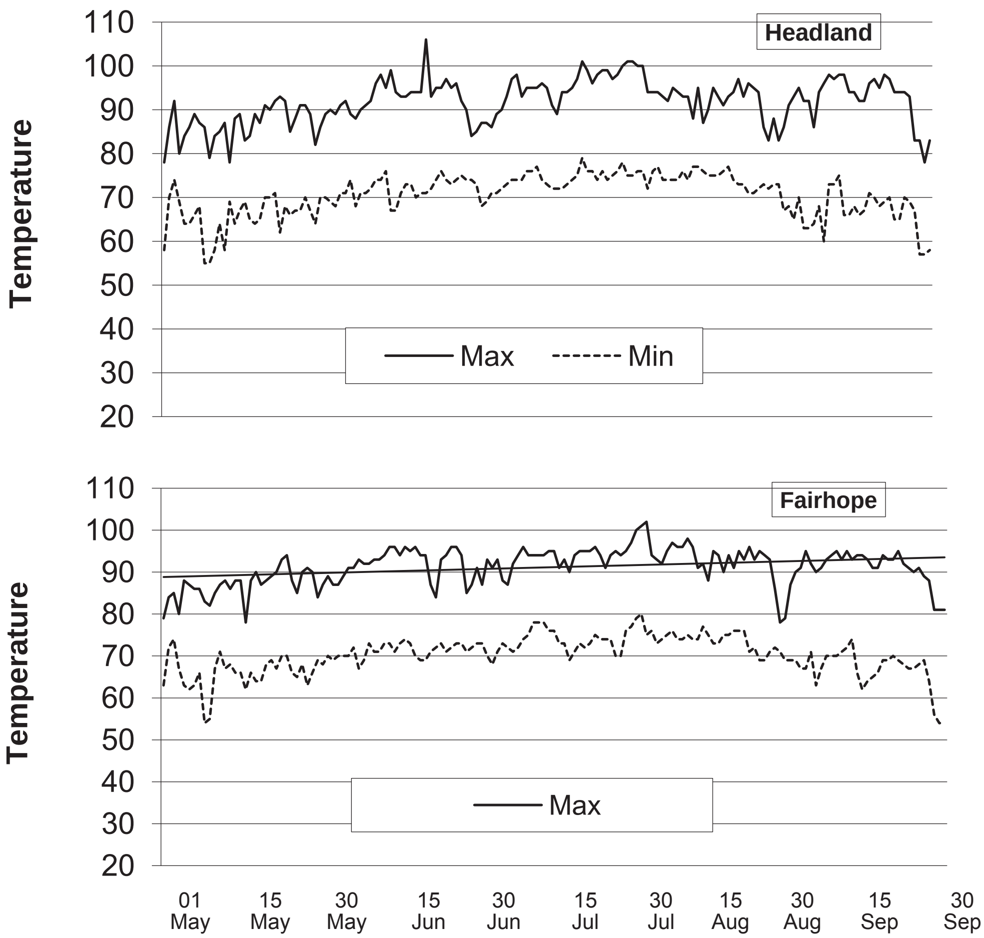
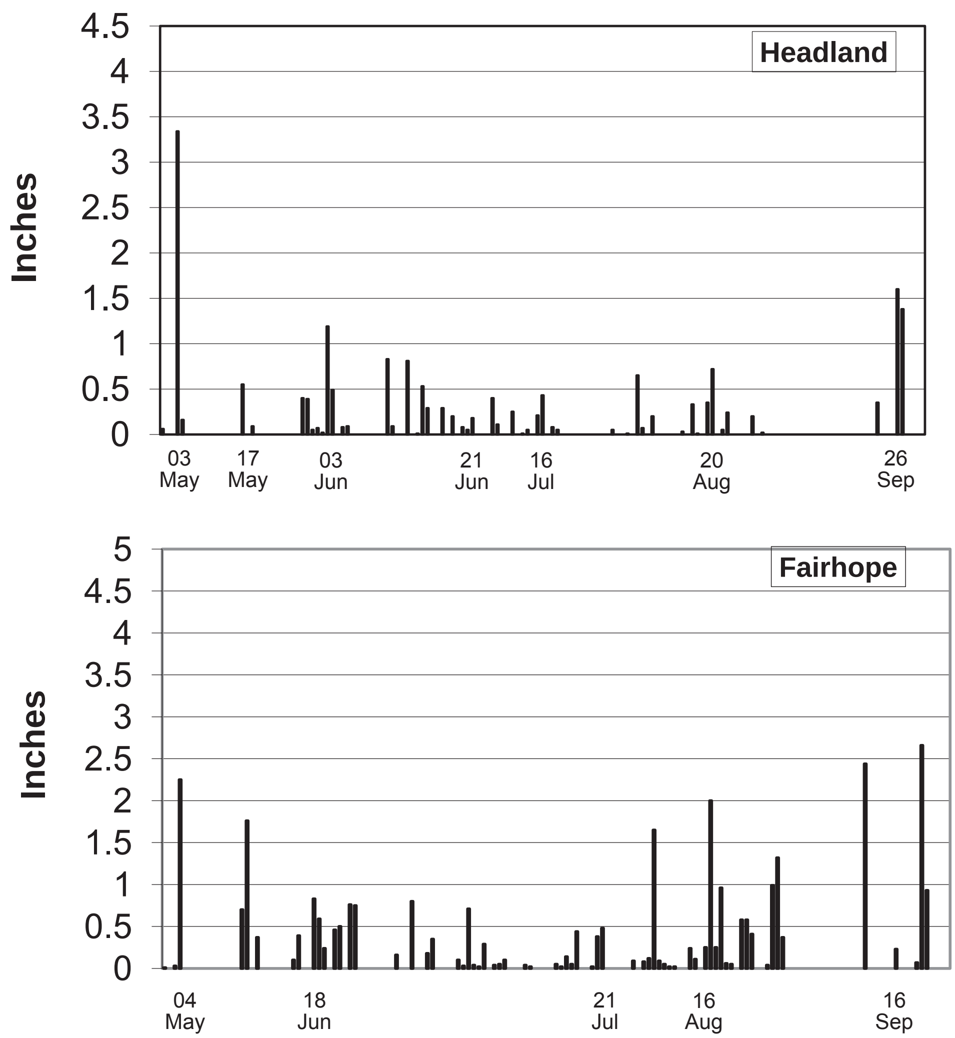


Figure 1. Daily minimum and maximum temperature (°F), May to October 2010.

At the GCREC, temperatures were at or above historical averages throughout the entire growing season (Figure 1), and rainfall totals were near normal throughout the entire growing season (Figure 2). Even though more consistent rainfall occurred throughout the growing season, leaf spot severity and rust severity was lower than in previous years. Despite the high temperatures, stem rot incidence was similar to that previously observed and yield decreases were not affected as in previous years.

While exact weather data were not available for the locations at PBU or BARU, temperatures at both locations were above normal for much of the growing season and rainfall was at or below normal.

Figure 2. Daily precipitation (inches), May to October 2010.



YIELD RESPONSE AND DISEASE CONTROL ON SELECTED COMMERCIAL PEANUT CULTIVARS WITH STANDARD AND HIGH INPUT FUNGICIDE PROGRAMS, WREC

A. K. Hagan, H. L. Campbell, K. L. Bowen, and L. W. Wells

Objective: To assess the yield response and reaction of commercial peanut cultivars to leaf spot diseases, tomato spotted wilt, and yield in a one-year out rotation with cotton when maintained with a standard and high-input fungicide program.

Production Methods: The study area at the Wiregrass Research and Extension Center in Headland, Alabama, was turned with a moldboard plow and worked to seed bed condition with a disk harrow. Rows were laid off on April 27 with a KMC strip till rig with rolling baskets. On May 14, 12 runner peanut cultivars and advanced breeding lines were planted at a rate of six seed per foot of row using conventional tillage practices in a Dothan fine sandy loam (organic matter <1 percent) soil. Temik 15G at 6 pounds per acre was applied in-furrow for thrips control. Weed control was obtained with a preemergent, incorporated application of Sonalan HFP at 1 quart per acre on May 11 that was followed by a broadcast application of Cadre at 1.44 ounces per acre on June 23. Soil fertility recommendations of the Alabama Cooperative Extension System were followed. The test area was irrigated as needed. A split plot design with peanut cultivars as whole plots and fungicide treatments as subplots was used. Whole plots were randomized in four complete blocks. Subplots, which consisted of four 30-foot rows spaced 3 feet apart, were randomized within each whole plot. While the standard fungicide program consisted of seven applications of 1.5 pints per acre of Bravo Weather Stik 6F, the high input program included two initial applications of Bravo Weather Stik at 1.5 pints per acre followed by Abound 2SC at 1.1 pints per acre, Bravo Weather Stik at 1.5 pints per acre + Convoy at 21 fluid ounces per acre, Abound 2SC at 1.1 pints per acre, Bravo Weather Stik 6F at 1.5 pints per acre + Convoy at 21 fluid ounces per acre, and two final applications of Bravo Weather Stik 6F at 1.5 pints per acre. Fungicides were applied on June 29, July 14, August 4, August 11, August 25, September 10, and September 23 with a tractor-mounted boom sprayer with three TX-8 nozzles per row calibrated to deliver 15 gallons of spray volume per acre at 45 psi.

Disease Assessment: Final TSWV hit counts (one hit was defined as ≤ 1 foot of consecutive severely TSWV-damaged plants per row) were made on September 29. Early leaf spot was rated October 17 using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made immediately after plot inversion on October 19. Yields were reported at 7 percent moisture. Significance of treatment effects was tested by analysis of variance and least significant difference (LSD) test ($P \leq 0.05$).

Results: With the exception of August, monthly rainfall totals during the study period were below to well below the 30-year historical average for the study site, while temperatures were often above normal, which resulted in reduced leaf spot intensity compared with 2009 levels. Temperatures and cropping patterns were favorable for stem rot but the disease failed to develop. Since the peanut cultivar x fungicide program interactions for tomato spotted wilt (TSWV), leaf spot diseases, white mold, and yield were not significant, data presented in Table 1 were pooled by fungicide program and in Table 2 by peanut cultivars.

While peanut cultivar had a significant impact on TSWV, leaf spot diseases, white mold, and yield, fungicide program did not (Table 1). Leaf spot intensity, white mold incidence, and yield response were similar for both the standard season-long Bravo Ultrex program and the high input program (Table 1). As expected, fungicide program had no effect on the incidence of TSWV.

Significant differences in the incidence of TSWV and white mold, leaf spot intensity, and yield were noted between the commercial peanut cultivars and breeding lines. Incidence of TSWV was significantly higher in Georgia Green compared with all other peanut cultivars (Table 2). Elevated TSWV incidence was also noted in the breeding lines C27-1516 and 08H22526. In contrast, Georgia Greener, Tifguard, Georgia-07W, Georgia-06G, and Florida 07 were among the cultivars in which TSWV was equally low. Leaf spot disease development was slowed by the hot and dry weather patterns in August and September. Highest leaf spot intensity was noted on Georgia-02C as well as the breeding lines C27-1516, 08H22526, and 08H51112. Georgia Green and Georgia Greener had low leaf spot ratings similar to Georgia-06G and 08H71314. Despite favorable weather conditions, white mold pressure was low. Georgia Green had higher white mold hit counts than the majority of peanut cultivars and some breeding lines. Highest yields were recorded for Florida 07, Georgia-06G, Georgia-07W, and Georgia Greener, while Georgia-02C, Georgia Green, and 08H61314 had among the lowest yields.

Summary: No improvements in leaf spot or white mold control or in yield gains were obtained with the costly high input program compared with the much lower cost standard, season-long Bravo Weather Stik program. As has been noted in previous years, Georgia Green is noticeably more susceptible to TSWV than the more recently released commercial peanut cultivars, Georgia Greener, Tifguard, Georgia-07W, Georgia-06G, and Florida 07, many of which also suffered little leaf spot or white mold damage. The latter cultivars also had among the highest yields as well. Generally, yields for the breeding lines were below those of the new commercial peanut cultivars.

TABLE 1. ANALYSIS OF VARIANCE AND IMPACT OF FUNGICIDE PROGRAMS ON TSWV, LEAF SPOT, WHITE MOLD, AND YIELD

	TSWV [1]	LS [2]	WM [1]	Yield (*lb/A*)
Split plot analysis *P*(F value)				
Cultivar	<0.0001*** [3]	<0.0001***	0.0017***	<0.0001***
Fungicide Program	0.9873	0.9740	0.8533	0.8459
Cultivar x Fungicide Program	0.8377	0.5542	0.0977	0.9286
Fungicide means				
Standard [4]	6.9 a	3.1 a	1.1 a	4218 a
High Input [4]	6.8 a	3.1 a	1.2 a	4228 a

[1] Tomato spotted wilt (TSWV) and white mold (WM) incidence is expressed as the number of disease hits per 60 feet of row.
[2] Early leaf spot (LS) severity was rated using the 1 to 10 Florida leaf spot scoring system.
[3] Significance at the 0.05, 0.01, and 0.001 levels is indicated by *, **, or ***, respectively.
[4] The standard fungicide program consisted of seven applications of Bravo Weather Stik, while the high input fungicide program began program began with two consecutive applications of Bravo Weather Stik followed by alternating applications of Abound 2SC with Convoy + Bravo Weather Stik, and a final application of Bravo Weather Stik. All fungicide applications were scheduled at two-week intervals.
Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

TABLE 2. TSWV, LEAF SPOT, WHITE MOLD, AND YIELD FOR COMMERCIAL PEANUT CULTIVARS AND BREEDING LINES

Cultivar means	TSWV [1]	LS [2]	WM [1]	Yield (*lb/A*)
1. Florida 07	4.8 de	3.0 b	1.0 bcde	4820 a
2. Georgia-02C	6.0 bcde	4.2 a	0.2 e	3501 e
3. Georgia-06G	4.3 de	2.4 d	1.2 bcde	4566 ab
4. Georgia-07W	5.1 cde	3.0 b	0.3 de	4646 a
5. Georgia Green	19.0 a	2.5 cd	2.4 a	3674 e
6. Georgia Greener	3.7 e	2.5 cd	0.5 cde	4667 a
7. Tifguard	4.6 de	2.9 bc	1.4 abcd	4332 bc
8. C27-1516	8.1 bc	4.0 a	1.5 abc	4045 d
9. 08H61314	6.7 bcde	2.9 bc	1.9 ab	3703 e
10. 08H22526	8.3 b	4.0 a	1.9 ab	4231 cd
11. 08H51112	7.0 bcde	3.8 a	0.6 cde	4352 bc
12. 08H71314	4.8 de	2.4 d	0.8 bcde	4138 cd

[1] Tomato spotted wilt (TSWV) and white mold (WM) incidence is expressed as the number of disease hits per 60 feet of row.
[2] Early leaf spot (LS) severity was rated using the 1 to 10 Florida leaf spot scoring system.
Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

IMPACT OF IN-FURROW FUNGICIDE TREATMENTS ON THE OCCURRENCE OF DISEASES AND YIELD OF PEANUT, WREC

A. K. Hagan, H. L. Campbell, K. L. Bowen, and L. W. Wells

Objective: To determine the impact of in-furrow applications of Proline 480SC on the control of leaf spot and white mold as well as on the yield of peanut in southeast Alabama.

Production Methods: The study area at the Wiregrass Research and Extension Center in Headland, Alabama, was turned with a moldboard plow and worked to seed bed condition with a disk harrow. On May 13, the runner peanut cultivar Georgia-06G was planted at a rate of six seed per foot of row using conventional tillage practices in a Dothan fine sandy loam (organic matter <1 percent) soil. Temik 15G at 6.5 pounds per acre was applied in-furrow for thrips control. Weed control was obtained with a preemergent, incorporated application of Sonalan HFP at 1 quart per acre on May 11 that was followed by a broadcast application of Cadre at 1.44 ounces per acre on June 23. Soil fertility recommendations of the Alabama Cooperative Extension System were followed. The test area was irrigated as needed. A center pivot system was used to deliver 1.0 acre inches of water on July 22, July 29, August 2, and August 10; 0.75 acre inches of water on August 18, August 24, and August 31; and 0.5 acre inches of water on September 7. The experimental design was a randomized complete block with individual plots consisting of four 30-foot rows on 3-foot centers arranged four replications. Proline 480SC was applied at-planting on a 6 -nch band centered over the seed in the open furrow with a single TX-8 nozzle calibrated to deliver 5 gallons of spray volume per acre. Bravo Weather Stik 6F at 1.5 pints per acre was applied at 14-day intervals on June 24, July 9, July 21, August 9, August 18, September 3, and September 18 to all plots for leaf spot control with a tractor-mounted boom sprayer with three TX-8 nozzles per row calibrated to deliver 15 gallons of spray volume per acre. Plots were dug on October 1 and combined on October 5.

Disease Assessment: Early leaf spot was rated September 24 using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made immediately after plot inversion on October 1. Yields were reported at 7.9 percent moisture. Significance of treatment effects was tested by analysis of variance and least significant difference (LSD) test ($P \leq 0.05$).

Results: The Fontalis program gave poorer leaf spot control than the other fungicide program. Leaf spot control with either rate of Provost 433SC was not enhanced with the in-furrow Proline 480SC treatment. When compared with the season-long Bravo Ultrex program, significant reductions in white mold incidence were obtained with the Proline 480SC AP/Bravo Ultrex/Provost 433SC at both 8 and 10.7 fluid ounces per acre as well as the Fontalis AP/Bravo Ultrex/Fontalis programs. Yields of all fungicide treatments did not significantly differ.

Summary: Hot and dry summer weather patterns suppressed Cylindrocladium root rot and favored the development of white mold. The level of leaf spot and white mold control as well as yield response with Provost 433SC at 8 and 10.7 fluid ounces per acre was not enhanced with the at-plant Proline 480 SC treatment. Despite significant reductions in white mold incidence with the both Proline 480SC AP/ Bravo Ultrex/ Provost 433SC programs, yields were similar to those noted for the season-long Bravo Ultrex program. Overall, yield was not increased with the at-plant Proline 480SC treatment in the absence of Cylindrocladium root rot.

IMPACT OF IN-FURROW FUNGICIDE TREATMENTS ON THE OCCURRENCE OF DISEASES AND YIELD OF PEANUT, WREC

Treatment and rate/A	Application timing	–Disease ratings– LS[1]	WM[2]	Yield lb/A
Bravo Ultrex 1.4 lb	1-7	2.6 b	12.5 a	3186 a
Bravo Ultrex 1.4 lb	1,2,7	2.3 b	6.8 ab	3037 a
Provost 433SC 8 fl oz	3,4,5,6			
Bravo Ultrex 1.4 lb.	1,2,7	2.0 b	6.8 ab	3473 a
Provost 433SC 10.7 fl oz	3,4,5,6			
Proline 480SC 5.7 fl oz	AP [3]	2.6 b	4.8 b	3473 a
Bravo Ultrex 1.4 lb	1,2,7			
Provost 433SC 8 fl oz	3,4,5,6			
Proline 480SC 5.7 fl oz	AP	2.1 b	3.5 b	3485 a
Bravo Ultrex 1.4 lb	1,2,7			
Provost 433SC 10.7 fl oz	3,4,5,6			
Fontalis 24 fl oz	AP	3.6 a	5.0 b	2904 a
Bravo Ultrex 1.4 lb	1,2,4,6,7			
Fontalis 12 fl o	3,5			
Abound 2SC 12 fl oz	AP	2.3 b	9.0 ab	3231 a
Bravo Ultrex 1.4 lb	1,2,4,6,7			
Abound 2SC 18.2 fl oz	3,5			

[1] Early and late leaf spot (LS) were assessed using the Florida leaf spot scoring system (1 = no disease;… 10 = completely dead plants).

[2] White mold incidence was expressed as the number of hits of each disease per plot.

[3] AP = in-furrow at plant application of Proline 480SC

Mean separation within columns was according to Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

DISEASE AND YIELD RESPONSE OF SELECTED COMMERCIAL PEANUT CULTIVARS AS INFLUENCED BY SEEDING RATE AND PLANTING DATE, WREC

A. K. Hagan, H. L. Campbell, K. L. Bowen, and L. W. Wells

Objective: To determine the impact of seeding rate as influence by planting date on the occurrence of TSWV, leaf spot, white mold, as well as the yield of selected commercial peanut cultivars in southeast Alabama.

Production Methods: The study area at the Wiregrass Research and Extension Center in Headland, Alabama, was turned with a moldboard plow and worked to seed bed condition with a disk harrow. Rows were laid off with a KMC strip till rig with rolling baskets. Runner peanut cultivars Florida 07, Georgia Green, and Georgia-06G, were planted on April 18 and May 20 using conventional tillage practices in a Dothan fine sandy loam (organic matter <1 percent) soil. Temik 15G at 6.7 pounds per acre was applied in-furrow for thrips control. Weed control was obtained with a preemergent, incorporated application of Sonalan HFP at 1 quart per acre on April 15 that was followed by a broadcast application of Cadre at 1.44 ounces per acre + 2,4 DB at 1 pint per acre on June 23. Soil fertility recommendations of the Alabama Cooperative Extension System were followed. A center pivot system was used to deliver 1.0 acre inches of water on July 22, July 29, August 2, and August 10; 0.75 acre inches of water on August 18, August 24, and August 31; and 0.5 acre inches of water on September 7. A split plot design with planting date (April 18 and May 20) as whole plots; peanut cultivars Florida 07, Georgia Green, and Georgia-06G as split-plots; and seeding rates of two, three, four, and six seed per row foot was used. Whole plots were randomized in four complete blocks. Individual split-split plots consisted of four 30-foot rows in four replications. Seven applications of Bravo Weather Stik 6F at 1.5 pints per acre were made at 14-day intervals on June 24, July 9, July 21, August 9, August 18, September 3, and September 18 to all plots for leaf spot control with a tractor-mounted boom sprayer with three TX-8 nozzles per row calibrated to deliver 15 gallons of spray volume per acre. Harvest dates for the first and second plantings were September 13 and October 5, respectively.

Disease Assessment: Final TSWV hit counts (one hit was defined as ≤ 1 foot of consecutive TSWV-damaged plants per row) were made for the first and second planting dates on September 7 and September 30, respectively. Early and late leaf spot were rated together on September 7 and September 30 for the first and second planting date, respectively, using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made immediately after plots were dug on September 10 and October 1 for the first and second planting dates, respectively. Yields were reported at approximately 8 percent moisture. Significance of treatment effects was tested by analysis of variance and the least significant difference (LSD) test ($P \leq 0.05$).

Results: While rainfall totals were below to well below the historical average through most of the summer months, temperatures were above to well above average throughout most of the summer of 2010. As a result, early leaf spot intensity was reduced below levels seen in previous years. Since the planting date x seeding rate, cultivar x seeding rate, and planting date x cultivar x seeding rate interactions for TSWV, leaf spot, white mold, and yield were not significant, data presented in the table for the whole plot and subplot variables were pooled (Table 1). The interaction for planting date x cultivar was significant for TSWV and yield, so the data for each variable are displayed separately by planting date and cultivar.

In contrast, cultivar selection significantly impacted TSWV and white mold incidence, leaf spot intensity, and pod yield. Seeding rate significantly influenced stand count, leaf spot intensity, and TSWV and white mold incidence but not yield.

Planting date had a significant impact on stand count and leaf spot intensity. Higher stand counts were noted at the April 20 compared with the May 18 planting date (Table 2). Leaf spot ratings were higher across all peanut cultivars and seeding rates at the May 18 than at the April 20 planting date. While overall TSWV incidence was unusually low, the impact of planting date on the incidence of this disease differed across the three peanut cultivars (Table 3). With Florida 07 and Georgia-06G, TSWV incidence was equally low at both planting dates. In contrast, higher TSWV hit counts on Georgia Green were recorded at the April 20 than at the May 18 planting date. Planting date had a significant impact on the yield of Florida 07 but not Georgia-06G and Georgia Green (Table 4). With Florida 07, yield was higher at the April 20 compared with the May 18 planting date.

Similar stand counts were recorded for Florida 07, Georgia-06G, and Georgia Green (Table 5). Incidence of TSWV and white mold was higher in Georgia Green than in Florida 07 and Georgia-06G, which had similar ratings for both diseases as well as higher yields. While overall leaf spot intensity was low, ratings for this disease were higher for Florida 07 and Georgia Green than for Georgia Green.

While stand density progressively rose with increasing seeding rates, yields did not significantly differ (Table 5). Incidence of TSWV was lower at seeding rates of three, four, and six seed per foot of row than two seed per foot of row. Leaf spot diseases and white mold intensified with rising seeding rates. Generally, highest ratings for both diseases were noted at rates of four and six seed per foot of row.

Summary: Peanut seed is a major input cost. Previously, incidence of TSWV and subsequent yield losses rose as seeding rate and ultimately stand density declined. Due to surprisingly low TSWV pressure, however, no specific conclusions could be drawn concerning the impact of seeding rate on the incidence of this disease. Leaf spot intensity and white mold incidence increased slightly but significantly with increasing seeding rate. In contrast, yield was not influenced by seeding rate. Planting date impacted TSWV incidence and yield on one of three peanut cultivars. Generally, Georgia-06G and Florida 07 suffered less disease damage and had higher yields than Georgia Green.

TABLE 1. ANALYSIS OF VARIANCE AND IMPACT OF FUNGICIDE PROGRAMS ON TSWV, LEAF SPOT, WHITE MOLD, CBR, AND YIELD OF THREE PEANUT CULTIVARS

	Stand count [1]	TSWV [2]	LS [3]	WM [2]	Yield (*lb/A*)
Split plot analysis *P*(F value)					
Planting Date	0.0236*[4]	0.2148	0.0002***	0.6273	0.1955
Cultivar	0.2487	<0.0001***	0.0077**	0.0048**	<0.0001***
Planting date x cultivar	0.1000	0.0065**	0.1571	0.5107	0.0827^
Seeding rate	<0.0001***	0.045*	0.0611^	0.0516^	0.6693
PD[5] x seeding rate	0.5751	0.7136	0.7007	0.5666	0.1247
Cultivar x seeding rate	0.9685	0.3080	0.9093	0.6537	0.9262
PD x cultivar x seeding rate	0.7029	0.6052	0.6895	0.8088	0.5709

[1] Stand counts were made from 30 ft of row.
[2] Tomato spotted wilt (TSWV), white mold (WM), and Cylindrocladium black rot (CBR) incidence is expressed as the number of disease hits per 60 feet of row.
[3] Leaf spot (LS) severity was rated using the 1 to 10 Florida leaf spot scoring system.
[4] Significance at the 0.10, 0.05, 0.01, and 0.001 levels is indicated by ^, *, **, or ***, respectively.
[5] PD = planting date

TABLE 2. IMPACT OF PLANTING DATE ON STAND COUNT, LEAF SPOT INTENSITY, AND WHITE MOLD INCIDENCE

Planting date	Stand count [1]	LS [2]	WM [3]
April 20	76 a	2.4 b	3.1 a
May 18	67 b	3.5 a	3.4 a

[1] Stand count is expressed as number of plants per 30 row feet.
[2] Early leaf spot (LS) was rated using the Florida 1 to 10 leaf spot rating scale.
[3]White mold (WM) severity is expressed as the number of hits per 60 feet of row.
Means followed by the same letter in each column are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

TABLE 3. INCIDENCE OF TSWV ON THREE PEANUT CULTIVARS IMPACTED BY PLANTING DATE

	TSWV incidence [1]		
Planting date	Florida 07	Ga.-06G	Ga. Green
April 20	0.8 a	0.8 a	3.6 a
May 18	0.8 a	1.4 a	2.3 b

[1]TSWV incidence was expressed as the number of disease hits per 60 foot of row.
Means followed by the same letter in each column are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

TABLE 4. INFLUENCE OF PLANTING DATE ON THREE PEANUT CULTIVARS

	Yield (lb/A)		
Planting date	Florida 07	Ga.-06G	Ga. Green
April 20	3848 a	3755 a	2963 a
May 18	3411 b	3260 a	2936 a

Means followed by the same letter in each column are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

TABLE 5. IMPACT OF CULTIVAR SELECTION AND SEEDING RATE ON STAND COUNT, TSWV AND WHITE MOLD INCIDENCE, LEAF SPOT INTENSITY, AND YIELD

	Stand count [1]	TSWV [2]	LS [3]	WM [2]	Yield (*lb/A*)
Peanut cultivar					
Florida 07	72.8 a	0.8 b	3.0 a	2.3 b	3634 a
Georgia-06G	71.2 a	0.9 b	2.8 b	3.1 b	3507 a
Georgia Green	70.2 a	2.9 a	3.1 a	4.5 a	2949 b
Seeding rate [4]					
2	51 d	2.1 a	2.8 b	2.0 b	3625 a
3	66 c	1.4 b	2.9 ab	3.3 a	3371 a
4	76 b	1.4 b	3.0 a	3.8 a	3365 a
6	94 a	1.4 b	3.1 a	4.0 a	3457 a

[1] Stand counts were made from 30 feet of row.
[2] Tomato spotted wilt (TSWV) and white mold (WM) incidence is expressed as the number of disease hits per 60 feet of row.
[3] Leaf spot (LS) severity was rated using the 1 to 10 Florida leaf spot scoring system.
[4] Seeding rates were two, three, four, and six seed per foot of row.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test ($P \leq 0.05$).

IMPACT OF TILLAGE, PEANUT CULTIVAR SELECTION, PLANTING DATE, AND ROW PATTERN ON YIELD AND OCCURRENCE OF DISEASES, WREC

A. K. Hagan, H. L. Campbell, K. L. Bowen, and L. W. Wells

Objective: To assess the impact of tillage practices (conventional compared with conservation tillage), cultivar selection, planting date, and row pattern (single compared with twin row) on peanut yield and the occurrence of TSWV, leaf spot, and white mold in southeast Alabama.

Production Methods: The study site at the Wiregrass Research and Extension Center in Headland, Alabama, has been maintained in a peanut-cotton-peanut rotation pattern. Conservation tillage plots were laid out in rye killed with Roundup Weathermax at 22 fluid ounces per acre in early March with a KMC subsoiler + coulter + rolling basket rig, while the conventional tillage plots were turned with a moldboard plow on April 13 and worked to seed bed condition with a disk harrow. Peanut cultivars Georgia Green and Tifguard were planted on April 21, May 18, and June 7, 2010 in a Dothan fine sandy loam (organic matter <1 percent) soil. Temik 15G at 6.5 pound per acre was applied in-furrow for thrips control. Weed control was obtained with a preplant application of Sonalan at 1 quart per acre + 0.45 ounce per acre of Strongarm on April 13 followed by a broadcast application of Fusilade at 12 fluid ounces per acre on June 22 and Classic at 0.5 ounce per acre on August 12. A center pivot irrigation system was used to apply 1.0 acre inches of water on July 27, August 10, and August 30. Row spacing included single 36-inch or twin rows spaced 7 inches apart on 36-inch centers. The experimental design was a split-split-split plot design with tillage as the whole plot, planting date as the split plot, peanut cultivar as the split-split plot and row spacing as the split-split-split plot. Plots consisted of four 30-foot rows in four replications. Seven applications of Bravo Weather Stik 6F at 1.5 pints per acre at 14-day intervals were made to all plots for leaf spot control with a tractor-mounted boom sprayer with three TX-8 nozzles per row calibrated to deliver 15 gallons of spray volume per acre at 45 psi.

Disease Assessment: Final TSWV hit counts (one hit was defined as ≤ 1 foot of consecutive TSWV-damaged plants per row) were made on August 31, September 23, and October 22 for the first, second, and third planting date, respectively. Early and late leaf spot were rated together on September 7, October 1, and October 26 for the first, second, and third planting dates, respectively, using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made immediately after plots were dug on September 7, October 1, and October 28 for the first, second, and third planting dates, respectively. Root knot nematode damage was rated on a 1 to 5 scale (1 = no damage to the pods or roots, 2 = 1 to 25 percent, 3 = 26 to 50 percent, 4 = 51 to75 percent, and 5 = >75 percent damage to the roots and pods). Yields were reported at 7 percent moisture. Analysis of variance was done using the PROC MIXED procedure in SAS with tillage, cultivar, planting date, and row spacing as fixed effects and replication as a random effect. Significance of treatment effects was tested by the least significant difference (LSD) test ($P \leq 0.05$).

Results–TSWV: Overall TSWV incidence was considerably below levels observed in recent years. The significant interaction of tillage x cultivar indicated that incidence of TSWV in Georgia Green and Tifguard differed by tillage and planting date (Table 1). While TSWV incidence was higher for conventional-till Georgia Green than Tifguard, when conservation tilled, these cultivars had similar disease ratings (Table 2). In addition, the conventional-tilled Tifguard had similar TSWV ratings as the conservation-tilled Georgia Green and Tifguard peanut cultivars. The significant tillage x planting date interaction for TSWV showed that influence of planting date on disease incidence differed on the conventional- and conservation-tilled peanuts (Table 1). Under conventional and conservation tillage, TSWV incidence was higher at the late planting date than at the two earlier planting

TABLE 1. ANALYSIS OF VARIANCE (ANOVA) TABLE FOR EFFECTS OF TILLAGE, PLANTING DATE, CULTIVAR, AND ROW PATTERN ON TSWV INCIDENCE, LEAF SPOT SEVERITY, STEM ROT INCIDENCE, AND PEANUT YIELD IN 2010

Source	TSWV [1]	LS [1]	WM [1]	Root knot	Yield (*lb/A*)
Tillage	<0.0001***[2]	0.0134*	0.0005***	1.0000	<0.0001***
Cultivar	<0.0001***	0.0010***	0.0127*	<0.0001***	<0.0001***
Tillage x cultivar	0.0354*	0.5860	0.2316	0.115	0.0951^
Planting date	<0.0001***	<0.0001***	<0.0001***	<0.0001***	0.0458*
Tillage x planting date	0.0817^	0.5590	0.0403*	0.5012	0.0341*
Cultivar x planting date	<0.0001***	0.0010***	0.2077	0.113	0.0119*
Tillage x cultivar x planting date	0.8195	0.6442	0.1674	0.8354	0.3098
Row spacing	0.1259	0.5860	0.0790^	0.0567^	0.0019**
Tillage x row spacing	0.7143	0.2320	0.1143	0.5223	0.0034**
Cultivar x row spacing	0.2731	0.9132	0.4491	0.5223	0.6617
Tillage x cultivar x row spacing	0.9416	0.7437	0.6586	1.0000	0.1607
Planting date x row spacing	0.5011	0.3411	0.4967	0.2349	0.7910
Tillage x planting date x row spacing	0.9028	0.8565	0.8754	0.6145	0.9496
Cultivar x planting date x row spacing	0.8647	0.9199	0.9389	0.1574	0.9368
Tillage x cultivar x planting date x row spacing	0.3801	0.7788	0.8967	0.9257	0.4960

[1] Tomato spotted wilt (TSWV), leaf spot (LS), and white mold (WM)
[2] Significance at the 0.10, 0.05, 0.01, and 0.001 levels is indicated by ^, *, **, or ***, respectively.

dates (Table 3). At the late planting date, disease levels were higher in the conventional- compared with conservation-till peanuts. As indicated by a significant interaction of planting date x peanut cultivar, TSWV incidence differed on each peanut cultivar at the late planting date compared with two earlier planting dates, where disease ratings were similar (Table 4). At the late June 7 but not earlier planting dates, TSWV incidence was higher on Georgia Green compared with Tifguard. Row pattern had no impact on TSWV incidence (data not shown).

TABLE 2. IMPACT OF TILLAGE AND CULTIVAR SELECTION ON TSWV INCIDENCE AND YIELD OF BOTH PEANUT CULTIVARS

Tillage / Peanut cultivar	TSWV [1]	Yield *lb/A*
Conventional		
Georgia Green	2.2 a	2525 c
Tifguard	0.8 b	3627 a
Conservation		
Georgia Green	1.0 b	2025 d
Tifguard	0.4 b	2844 b
LSD (P≤0.05)	***0.7***	***259***

[1] TSWV incidence is expressed as the number of hits of each disease per 60 foot of row.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

TABLE 3. IMPACT OF TILLAGE AND PLANTING DATE ON THE INCIDENCE OF TSWV AND WHITE MOLD AS WELL AS ON PEANUT YIELD

Tillage / Planting date	TSWV [1]	WM [1]	Yield *lb/A*
Conventional			
April 21	0.5 cd	4.3 b	3084 ab
May 18	1.0 bc	3.7 b	2973 ab
June 7	3.0 a	3.2 b	3172 a
Conservation			
April 21	0.3 d	7.5 a	2717 bc
May 18	0.2 cd	4.6 b	2325 cd
June 7	1.7 b	3.8 b	2261 d
LSD (P≤0.05)	***0.8***	***1.5***	***42*1

[1] Tomato spotted wilt virus (TSWV) and white mold (WM) incidence is expressed as the number of hits of each disease per 60 foot of row.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

Resuts—Leaf Spot: Due to dry late summer weather, leaf spot incidence was lower than was noted in earlier years. As indicated by a significant interaction of planting date x peanut cultivar, leaf spot intensity differed on Georgia Green and Tifguard at the late compared with two earlier planting dates (Table 4). In addition, leaf spot ratings were higher at the earlier April 21 and May 18 planting dates on Georgia Green than Tifguard, while leaf spot ratings for both cultivars were similar at the final June 7 planting date. Leaf spot intensity was higher on the conservation-till than on the conventional-till peanuts (Table 5). Row spacing had no influence on leaf spot intensity.

Results–White Mold: The significant tillage x planting date interaction showed that white mold incidence differed across planting dates on the conventional- and conservation-tilled peanuts (Table 1). While white mold incidence was similar on the conventional-tilled peanuts at all planting dates, occurrence of this disease was higher at the April 21 compared with the latter two planting dates on the conservation-tilled peanuts (Table 3). White mold incidence was higher on Georgia Green than Tifguard (Table 6).

Results–Root Knot Nematode Damage: The level of galling on the roots and pods that was attributed to the peanut root knot nematode was significantly impacted by planting date and peanut cultivar but not row pattern and tillage (Table 1). Georgia Green had a significantly higher root and pod damage rating compared with Tifguard (Table 6). Root knot damage ratings were also higher at the June 7 than at the two earlier planting dates where similar levels of galling on the roots and pods were noted (Table 7).

Results–Yield: The significant interaction of tillage x cultivar indicated that yield of Georgia Green and Tifguard differed by tillage practices (Table 1). Regardless of tillage practices, Tifguard had a higher yield than Georgia Green. In addition, yields of Georgia Green and Tifguard were higher when under conventional tillage than under conservation tillage (Table 2). As indicated by a significant tillage x planting date interaction, yield for conventional- and conservation-tilled peanuts differed by planting date (Table 1). At the May 17 and June 7 but not the April 21 planting dates, yields were higher for the conventional-tilled than for the conservation-tilled peanuts (Table 3). While yield was similar at all planting dates for conventional-tilled peanuts, highest yield for the conservation-tilled peanuts occurred at the early April 21 planting date, while peanuts planted at the May 17 and June 7 planting dates had equally low yields. A significant cultivar x planting date interaction demonstrated that yield response of Tifguard but not Georgia Green differed over planting dates. At all planting dates, Georgia Green had equally lower yields when compared with Tifguard (Table 1). In contrast, yield for Tifguard was higher at the April 21 and June 7 planting dates than at the May 17 planting date (Table 4). As indicated by a significant tillage x row pattern interaction, yields of the conservation-tilled but not the conventional-tilled peanuts were impacted by row pattern (Table 8). For the conventional-tilled peanuts, similarly high yields were recorded with the single and twin row pattern. With conservation tillage, yield was higher for the twin compared with the single row pattern. Regardless of the row pattern, the conventional-tilled peanuts outyielded the conservation-tilled peanuts.

Summary: Production practices can have a significant impact on occurrence of diseases that may ultimately impact peanut yield. In this study, TSWV incidence was higher on conventional-tilled than conservation-tilled Georgia Green but not Tifguard peanuts. In contrast to previous reports, TSWV incidence was higher in the last rather than earlier planting dates on both conventional- and conservation-tilled peanuts. Overall, Tifguard proved less susceptible to TSWV than Georgia Green. While overall leaf spot pressure was low, disease intensity was highest at the late compared with the two earlier planting dates, where lower disease ratings were recorded for Georgia Green than for Tifguard. In contrast to the previous year, leaf spot intensity was lower with conventional than with conservation tillage. Planting date impacted white mold incidence on the conservation-tilled peanuts, where the highest disease incidence was found on April 17 but did not impact later planted peanuts or conventional-tilled peanuts. Tifguard proved less susceptible to white mold and root knot than Georgia Green. Galling attributed to the peanut root knot nematode was higher at the June 7 planting date than at earlier planting dates. Regardless of tillage and planting date, Tifguard had lower white mold and nematode damage ratings and higher yields than Georgia Green. Planting date significantly impacted yield of Tifguard but not Georgia Green. Yield declined with advancing planting dates for the conservation-tilled but not the conventional-tilled peanuts.

TABLE 4. IMPACT OF PLANTING DATE AND CULTIVAR SELECTION ON TSWV INCIDENCE, LEAF SPOT INTENSITY, AND YIELD OF TWO PEANUT CULTIVARS

Planting date Cultivar	TSWV [1]	LS [2]	Yield *lb/A*
April 21			
Georgia Green	0.5 c	2.5 c	2333 c
Tifguard	0.2 c	2.9 b	3467 a
May 18			
Georgia Green	0.8 bc	2.5 c	2349 c
Tifguard	0.4 c	2.8 b	2948 b
June 7			
Georgia Green	3.5 a	3.3 a	2142 c
Tifguard	1.3 b	3.2 a	3291 a
LSD (P≤0.05)	***0.7***	***0.2***	***362***

[1] Tomato spotted wilt virus (TSWV) incidence is expressed as the number of hits of each disease per 60 foot of row.
[2] Late and early leaf spot (LS) severity rated using the Florida 1 to 10 leaf spot rating scale.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

TABLE 5. INFLUENCE OF TILLAGE ON LEAF SPOT INTENSITY AND WHITE MOLD INCIDENCE

Tillage	Leaf spot rating [1]
Conventional	2.8 b
Conservation	3.0 a
LSD (P≤0.05)	***0.1***

[1] Late and early leaf spot (LS) severity rated using the Florida 1 to 10 leaf spot rating scale.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

TABLE 6. INFLUENCE OF PEANUT CULTIVAR ON NEMATODE DAMAGE AND INCIDENCE OF WHITE MOLD

Cultivar	White mold [1]	Nematode damage [2]
Georgia Green	5.1 a	2.7 a
Tifguard	4.0 b	1.4 b
LSD (P≤0.05)	***0.9***	***0.2***

[1] White mold incidence are expressed as the number of hits of each disease per 60 foot of row.
[2] Nematode damage on the roots and pods was rated on a 1 to 5 scale immediately after plot inversion.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

TABLE 7. IMPACT OF PLANTING DATE ON THE LEVEL OF ROOT KNOT NEMATODE DAMAGE ON THE ROOTS AND PODS

Planting date	Root knot damage [1]
April 21	1.8 b
May 17	1.8 b
June 7	2.6 a
LSD (P≤0.05)	***0.2***

[1] Nematode damage on the roots and pods was rated on a 1 to 5 scale immediately after plot inversion.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

TABLE 8. IMPACT OF TILLAGE AND ROW PATTERN ON PEANUT YIELD

Tillage Row pattern	Yield *(lb/A)*
Conventional	
Single	3068 a
Twin	3084 a
Conservation	
Single	2172 c
Twin	2682 b
LSD P≤0.05)	***378***

Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test (*P*≤0.05).

DISEASE RISK INDEX FUNGICIDE PROGRAMS COMPARED FOR THE CONTROL OF LEAF SPOT DISEASES AND WHITE MOLD AND THE IMPACT ON YIELD OF TWO PEANUT CULTIVARS IN SOUTHEAST ALABAMA, WREC

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Objective: To validate the effectiveness of Disease Risk Index fungicide programs for the control of leaf spot diseases and white mold as well as yield response of two peanut cultivars in southeast Alabama.

Production Methods: On May 14, the peanut cultivars Georgia-06G and Georgia-07W were planted at a rate of six seed per foot of row using conventional tillage practices in a Dothan fine sandy loam (organic matter <1 percent) soil at the Wiregrass Research and Extension Center in Headland, Alabama. Weed control and soil fertility recommendations of the Alabama Cooperative Extension System were followed. The test area was irrigated as needed. A split plot design with peanut cultivars as whole plots and fungicide treatments as subplots was used. Whole plots were randomized in four complete blocks. Individual subplots consisted of four 30-foot rows spaced 3 feet apart. Full canopy sprays of each fungicide treatment were made on a standard 14-day calendar schedule on 1 = June 24, 1.5 = July 2, 2 = July 9, 3 = July 23, 3.5 = August 2, 4 = August 6, 5 = August 18, 5.5 = August 27, 6 = September 2, 6.5 = September 9, and 7 = September 17 with a tractor-mounted boom sprayer with three TX-8 nozzles per row calibrated to deliver 15 gallons of spray volume per acre at 45 psi. A total of four, five, and seven fungicide applications, respectively, were scheduled for the Peanut Disease Risk Index low, medium, and high risk categories.

Disease Assessment: Early and late leaf spot (LS) were rated together on September 24 using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold counts (one hit was defined as ≤ 1 foot of consecutive diseased plants per row) were made immediately after plot inversion on October 1. Yields were reported at 8 percent moisture. Significance of treatment effects was tested by analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$). Data were pooled across peanut cultivars.

Results: With the exception of August, monthly rainfall totals during the study period were below to well below the 30-year historical average for the study site, while temperatures were often above normal, which resulted in reduced leaf spot intensity compared with 2009.

Based on 2010 Peanut Disease Risk Index guidelines, this study site would be rated as a medium and high risk for leaf spot and white mold for Georgia-06G and Tifguard, respectively (http://www.caes.uga.edu/commodities/fieldcrops/peanuts/2010peanutupdate/index.html). Fungicide treatment had a significant impact on leaf spot disease intensity but not on white mold incidence or yield (Table 1). Since the cultivar x fungicide treatment interaction for leaf spot diseases was significant, data were segregated by peanut cultivar. While the leaf spot ratings and yields were similar, white mold incidence was higher on Georgia-07W than on Georgia-06G (Table 1).

On Georgia-07W, better leaf spot control was obtained with the high risk Bravo WS programs when compared with the corresponding medium and low risk fungicide programs (Table 2) while no differences in leaf spot control were obtained with the high, medium, and low risk programs for the low rate of Abound 2SC. At the high rate of Abound 2SC, both high risk programs gave better leaf spot control compared with the corresponding low but not medium risk program. On Georgia-06G, the high risk programs with both rates of Abound 2SC often proved no more effective in controlling leaf spot on peanut than the corresponding medium and low risk programs.

White mold incidence was higher for the medium risk Bravo WS program compared with the high risk Abound 2SC program with Bravo WS but not with Tilt Bravo SE (Table 3). Yields for the Abound 2SC programs (both 12.3 and 18.2 fluid ounces per acre) at all risk categories did not significantly differ. Replacement of Bravo WS with Tilt Bravo SE also did not influence pod yield. In contrast, the low risk Bravo WS program had a higher yield compared with the corresponding high and medium risk programs, which had similar yields.

TABLE 1. ANOVA TABLE FOR MAIN AND SUBPLOT TREATMENT EFFECTS

	LS [1]	WM [2]	Yield *lb/A*
Source			
Peanut cultivar	0.0943	0.0508	0.2109
Fungicide	<0.0001***[3]	0.6940	0.7698
Cultivar x fungicide	<0.0001***	0.6929	0.3766
Peanut cultivar			
Georgia-07W	3.2 a	3.4 a	4385 a
Georgia-06G	3.3 a	2.1 b	4501 a

[1] Leaf spot (LS) was rated using the Florida 1 to 10 peanut leaf spot rating scale.
[2] White mold incidence is expressed as the number of hits per 60 foot of row.
[3] Significance at the 0.05, 0.01, and 0.001 levels is indicated by *, **, or ***, respectively.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test ($P \leq 0.05$).

Summary: With a few exceptions, the Disease Risk Index high, medium, and low risk programs with the low and high rates of Abound 2SC gave surprisingly similar control of leaf spot diseases. Also, the low rate of Abound 2SC appeared to be as equally effective as the high rate of the same fungicide in controlling leaf spot diseases. Yield response with the high, medium, and low risk programs with both rates of Abound 2SC was also similar.

TABLE 2. DISEASE RISK INDEX FUNGICIDE PROGRAMS COMPARED FOR THE CONTROL OF LEAF SPOT DISEASES ON GEORGIA-07W AND GEORGIA-06G

Fungicide program and rate/A	—Application— timing[1]	number	Risk index	—Leaf spot rating[2]— Ga.-07W	Ga.-06G
Bravo WS [3] 1.5 pt	1,2,3,4,5,6,7	7	High	3.0 c	2.8 ef
Bravo WS 1.5 pt	1.5,3,4.5,5.5,7	5	Med	4.0 a	4.7 a
Bravo WS 1.5 pt	2,3.5,5,6.5	4	Low	3.5 ab	3.3 cde
Bravo WS 1.5 pt	1,2,4,6,7				
Abound 2SC 12.3 fl oz	3,5	7	High	2.7 c	3.3 cde
Tilt Bravo SE 24 fl oz	1,2,4	7	High	2.9 bc	4.0 b
Abound 2SC 12.3 fl oz	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 36 fl oz	1.5	5	Med	3.5 ab	3.5 bcd
Abound 2SC 12.3 fl oz	3,5.5				
Tilt Bravo SE 24 fl oz	4				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 36 fl oz	2	4	Low	3.5 ab	2.8 ef
Bravo WS 1.5 pt +					
Abound 2SC 12.3 fl oz	3.5,5				
Bravo WS 1.5 pt	6.5				
Bravo WS 1.5 pt	1,2,4,6,7	7	High	2.6 c	3.8 bc
Abound 2SC 18.2 fl oz	3,5				
Tilt Bravo SE 36 fl oz	1,2,4	7	High	2.7 c	2.5 f
Abound 2SC 18.2 fl oz	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 36 fl oz	1.5,4	5	Med	3.2 bc	3.2 de
Abound 2SC 18.2 fl oz	3,5.5				
Tilt Bravo SE 24 fl oz	4				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 36 fl oz	2	4	Low	3.5 ab	3.0 def
Bravo WS 1.5 pt +					
Abound 2SC 18.2 fl oz	3,5.5				
Bravo WS 1.5 pt	6.5				

[1] Fungicide applications were made on 1 = June 24, 1.5 = July 2, 2 = July 9, 3 = July 23, 3.5 = August 2, 4 = August 6, 5 = August 18, 5.5 = August 27, 6 = September 2, 6.5 = September 9, and 7 = September 17.
[2] Leaf spot severity was rated using the 1 to 10 Florida peanut leaf spot scoring system.
[3] Bravo WS = Bravo Weather Stik 6F
Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

TABLE 3. DISEASE RISK INDEX FUNGICIDE PROGRAMS COMPARED FOR THE CONTROL OF LEAF SPOT DISEASES AND WHITE MOLD AS WELL AS ON THE YIELD OF TWO PEANUT CULTIVARS

Fungicide program and rate/A	—Application— timing[1]	number	Risk index	White mold[2]	Yield *lb/A*
Bravo WS[3] 1.5 pt	1,2,3,4,5,6,7	7	High	3.1 ab	4321 bc
Bravo WS 1.5 pt	1.5,3,4.5,5.5,7	5	Med	3.7 a	3924 c
Bravo WS 1.5 pt	2,3.5,5,6.5	4	Low	3.2 ab	4723 a
Bravo WS 1.5 pt	1,2,4,6,7	7	High	3.0 ab	4517 ab
Abound 2SC 12.3 fl oz	3,5				
Tilt Bravo SE 24 fl oz	1,2,4	7	High	2.6 ab	4542 ab
Abound 2SC 12.3 fl oz	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 36 fl oz	1.5	5	Med	2.7 ab	4364 ab
Abound 2SC 12.3 fl oz	3,5.5				
Tilt Bravo SE 24 fl oz	4				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 36 fl oz	2	4	Low	2.6 ab	4731 a
Bravo WS 1.5 pt +					
Abound 2SC 12.3 fl oz	3.5,5				
Bravo WS 1.5 pt	6.5				
Bravo WS 1.5 pt	1,2,4,6,7	7	High	1.8 b	4312 ab
Abound 2SC 18.2 fl oz	3,5				
Tilt Bravo SE 36 fl oz	1,2,4	7	High	1.9 ab	4610 a
Abound 2SC 18.2 fl oz	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 36 fl oz	1.5,4	5	Med	2.7 ab	4566 ab
Abound 2SC 18.2 fl oz	3,5.5				
Tilt Bravo SE 24 fl oz	4				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 36 fl oz	2	4	Low	3.3 ab	4356 ab
Bravo WS 1.5 pt +					
Abound 2SC 18.2 fl oz	3,5.6				
Bravo WS 1.5 pt	6.5				

[1] Fungicide applications were made on 1 = June 24, 1.5 = July 2, 2 = July 9, 3 = July 23, 3.5 = August 2, 4 = August 6, 5 = August 18, 5.5 = August 27, 6 = September 2, 6.5 = September 9, and 7 = September 17.

[2] White mold incidence is expressed as the number of hits per 60 foot of row.

[3] Bravo WS = Bravo Weather Stik 6F

Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

PEANUT DISEASE RISK INDEX FUNGICIDE PROGRAMS COMPARED FOR THE CONTROL OF LATE LEAF SPOT AND RUST IN SOUTHWEST ALABAMA, GCREC

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Objective: To validate the Peanut Disease Risk Index program for control of leaf spot diseases and white mold and for impact on the yield of two peanut cultivars in southwest Alabama.

Production Methods: On May 28, commercial runner-market type peanut cultivars Georgia-06G and Tifguard were planted at a rate of six seed per foot of row using conventional tillage practices in a Malbis fine sandy loam (organic matter <1 percent) soil at the Gulf Coast Research and Extension Center near Fairhope, Alabama, in a field cropped to peanut every third year. An early cracking herbicide application of Gramoxone Inteon at 8 fluid ounces per acre + Storm at 1 pint per acre + Induce (NIS) was made on June 11. Postemergent weed control was obtained with an application of Poast at 1.5 pints per acre + Crop Oil at 1 quart per acre on June 24 followed by Cadre at 2 fluid ounces per acre + Strongarm at 0.225 ounce per acre + Induce (NIS) on July 7. The test area was not irrigated. A split plot design with cultivars as whole plots and fungicide treatments as subplots was used. Whole plots were randomized in four complete blocks. Individual subplots consisted of four 30-foot rows spaced 3.2 feet apart. Full canopy sprays of the fungicide treatments were made using an ATV-mounted boom sprayer with three TX-8 nozzles per row at 10 gallons of spray volume per acre at 45 psi. Fungicide applications were made on 1 = July 6, 1.5 = July 13, 2 = July 20, 3 = August 4, 3.5 = August 11, 4 = August 18, 5 = September 2, 5.5 = September 4, 6 = September 10, 6.5 = September 17, and 7 = September 28.

Disease Assessment: Leaf spot diseases were rated on October 12 using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). Rust severity was assessed on October 12 using the ICRISAT 1 to 9 rating scale (1 = no disease and 9 = 80 to 100 percent of leaves withered). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive diseased plants per row) were made immediately after plot inversion on October 20. Yields were reported at 9 percent moisture. Significance of treatment effects was tested by analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$). Data presented in the table were pooled across peanut cultivar.

Results: Rainfall totals for May, June, August, and September were near to above the 30-year average but below average for July and October. Despite wet weather in August and September, leaf spot disease and rust pressure were below levels seen in the previous two years. Based on Peanut Disease Risk Index guidelines, this site was rated as a low and medium risk for leaf spot and stem rot for Georgia-06G and Tifguard, respectively (http://www.caes.uga.edu/commodities/fieldcrops/peanuts/2010peanutupdate/index.html). Due to very low stem rot pressure, disease incidence, which was similarly low for all programs, is not reported. Peanut cultivar and fungicide treatments both had a significant impact on leaf spot and rust intensity (Table 1). Since the cultivar x fungicide treatment interaction for rust was significant, data were segregated by peanut cultivar. In contrast, the cultivar x fungicide interaction for leaf spot intensity and yield was not significant, so data for each variable were pooled by peanut cultivar and by fungicide treatment. While leaf spot and rust intensity was lower on Tifguard, Georgia-06G had a higher yield.

With the high rate of Abound 2SC, rust spot intensity on Tifguard was similar for all risk categories (Table 2). At the lower rate, the Bravo WS/Abound 2SC high risk program provided better rust spot control compared with the corresponding low risk program. With Bravo WS alone, better rust control was obtained with the high compared with the low risk program, while the medium risk program had intermediate results on both Tifguard and Georgia-06G. At the low rate of Abound 2SC, the Tilt Bravo SE/Abound 2SC/Bravo WS program gave better rust control on Georgia-06G than the low risk program with the same fungicides. At the high rate, the Bravo WS/Abound 2SC high risk program gave better rust control compared with the corresponding low risk program. In addition, similar levels of rust control were obtained in all risk category with the Tilt Bravo SE/Abound 2SC programs.

At both rates, the Abound 2SC low risk programs often had significantly higher leaf spot levels than the corresponding high risk programs, which had similar levels. The medium and low risk programs for both rates of Abound 2SC also gave similar leaf spot control. The high but not medium and low risk Bravo Weather Stik programs gave better control than the corresponding program schedules with either rate of Abound 2SC (Table 3). Similar yields were recorded for all Abound 2SC and Bravo Weather Stik programs.

TABLE 1. ANOVA TABLE FOR MAIN AND SUBPLOT TREATMENT EFFECTS

	LS [1]	Rust [2]	Yield *lb/A*
Source			
Peanut cultivar	0.0004***[3]	0.0007***	0.1806
Fungicide	<0.0001***	0.0002***	0.9242
Cultivar x fungicide	0.0504	0.0316*	0.3790
Peanut cultivar			
Georgia-06G	3.5 a	3.1 a	6616 a
Tifguard	2.9 b	2.2 b	6323 b

[1] Late leaf spot (LS) was rated using the Florida 1 to 10 peanut leaf spot rating scale.
[2] Rust severity was assessed using the ICRISAT 1 to 9 rating scale.
[3] Significance at the 0.05, 0.01, and 0.001 levels is indicated by *, **, or ***, respectively.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test ($P≤0.05$).

Summary: Given the relatively drier late summer and fall weather patterns when compared to previous years, late leaf spot and rust intensity was greatly reduced when compared with the previous two years. As a result, fungicide application interval had relatively little impact on the level of disease control with Bravo Weather Stik alone or with the low and high rate Abound 2SC programs. Since relatively little difference in disease control was noted between the high, medium, and low risk programs, which included seven, five, and four total fungicide applications, yields for all fungicide programs did not significantly differ. In other words, yield response with four, five, and seven applications of Bravo Weather Stik were similar. Programs that included low (12.32 fluid ounces per acre) and high (18.2 fluid ounces per acre) rates of Abound 2SC had similar yield responses and ratings for late leaf spot and rust.

TABLE 2. DISEASE RISK INDEX FUNGICIDE PROGRAMS COMPARED FOR THE CONTROL OF LEAF SPOT DISEASES ON GEORGIA-06G AND TIFGUARD

Fungicide program and rate/A	—Application— timing[1]	number	Risk index	—Leaf spot rating [2]— Tifguard	Ga.-06G
Bravo WS [3] 1.5 pt	1,2,3,4,5,6,7	7	High	2.4 c	2.4 d
Bravo WS 1.5 pt	1.5,3,4.5,5.5,7	5	Med	2.8 bc	3.5 abc
Bravo WS 1.5 pt	2,3.5,5,6.5	4	Low	3.0 ab	3.8 ab
Bravo WS 1.5 pt	1,2,4,6,7	7	High	2.7 bc	3.7 ab
Abound 2SC 0.8 pt	3,5				
Tilt Bravo SE 1.5 pt	1,2,4	7	High	2.8 ab	3.2 bc
Abound 2SC 0.8 pt	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 2.25 pt	1.5,4	5	Med	3.0 ab	3.5 abc
Abound 2SC 0.8 pt	3,5.5				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 2.25 pt	2	4	Low	3.2 a	4.0 a
Bravo WS 1.5 pt +					
Abound 2SC 0.8 pt.	3.5,5				
Bravo WS 1.5 pt	6.5				
Bravo WS 1.5 pt	1,2,4,6,7	7	High	2.8 ab	2.8 cd
Abound 2SC 1.1 pt	3,5				
Tilt Bravo SE 1.5 pt	1,2,4	7	High	2.9 ab	3.5 abc
Abound 2SC 1.1 pt	3,5				
Bravo WS 1.5 pt.	6,7				
Tilt Bravo SE 2.25 pt	1.5,4	5	Med	3.2 a	3.6 ab
Abound 2SC 1.1 pt	3,5.5				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 2.25 pt	2	4	Low	2.9 ab	4.1 a
Bravo WS 1.5 pt +					
Abound 2SC 1.1 pt	3,5.5				
Bravo WS 1.5 pt	6.5				

[1] Fungicide applications were made on 1 = July 6, 1.5 = July 13, 2 = July 20, 3 = August 4, 3.5 = August 11, 4 = August 18, 5 = September 2, 5.5 = September 4, 6 = September 10, 6.5 = September 17, and 7 = September 28.
[2] Leaf spot severity was rated using the 1 to 10 Florida peanut leaf spot scoring system.
Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P≤0.05$).
[3] Bravo WS = Bravo Weather Stik 6F

TABLE 3. DISEASE RISK INDEX FUNGICIDE PROGRAMS COMPARED FOR THE CONTROL OF LEAF SPOT DISEASES AND YIELD OF TWO PEANUT CULTIVARS

Fungicide program and rate/A	—Application— timing[1]	number	Risk index	Leaf spot[2]	Yield *lb/A*
Bravo WS[3] 1.5 pt	1,2,3,4,5,6,7	7	High	2.4 e	6351 a
Bravo WS 1.5 pt	1.5,3,4.5,5.5,7	5	Med	3.1 bcd	6572 a
Bravo WS 1.5 pt	2,3.5,5,6.5	4	Low	3.4 ab	6528 a
Bravo WS 1.5 pt	1,2,4,6,7	7	High	3.2 bcd	6370 a
Abound 2SC 0.8 pt	3,5				
Tilt Bravo SE 1.5 pt	1,2,4	7	High	3.0 cd	6440 a
Abound 2SC 0.8 pt	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 2.25 pt	1.5,4	5	Med	3.3 abc	6619 a
Abound 2SC 0.8 pt	3,5.5				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 2.25 pt	2	4	Low	3.6 a	6323 a
Bravo WS 1.5 pt +					
Abound 2SC 0.8 pt	3.5,5				
Bravo WS 1.5 pt	6.5				
Bravo WS 1.5 pt	1,2,4,6,7	7	High	2.8 d	6500 a
Abound 2SC 1.1 pt	3,5				
Tilt Bravo SE 1.5 pt	1,2,4	7	High	3.2 bcd	6339 a
Abound 2SC 1.1 pt	3,5				
Bravo WS 1.5 pt	6,7				
Tilt Bravo SE 2.25 pt	1.5,4	5	Med	3.4 ab	6366 a
Abound 2SC 1.1 pt	3,5.5				
Bravo WS 1.5 pt	7				
Tilt Bravo SE 2.25 pt	2	4	Low	3.5 ab	6714 a
Bravo WS 1.5 pt +					
Abound 2SC 1.1 pt	3,5.5				
Bravo WS 1.5 pt	6.5				

[1] Fungicide applications were made on 1 = July 6, 1.5 = July 13, 2 = July 20, 3 = August 4, 3.5 = August 11, 4 = August 18, 5 = September 2, 5.5 = September 4, 6 = September 10, 6.5 = September 17, and 7 = September 28.

[2] Leaf spot was rated using the Florida 1 to 10 rating scale (1 = no disease and 10 = plants defoliated or dead.

[3] Bravo WS = Bravo Weather Stik 6F

Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

INFLUENCE OF CROPPING SEQUENCE ON DISEASES, NEMATODES, AND ON THE YIELD OF PEANUT, COTTON, AND CORN IN SOUTHWEST ALABAMA, GCREC

A. K. Hagan, H. L. Campbell, K. S. Lawrence, K. L. Bowen, and M. D. Pegues

Objectives: (1) To assess the impact of corn cropping frequency on the severity of diseases of peanut and on populations of the southern root-knot nematode on corn, cotton, and peanut; and (2) to define the agronomic benefits of corn as a rotation partner with peanut and cotton.

Production Methods–General: On March 16, 250 pounds per acre of 9.5-24-24 analysis fertilizer amended with 10 pounds per acre of sulfur and 3 pounds per acre of zinc was broadcast on the study site at the Gulf Coast Research and Extension Center near Fairhope, Alabama. Prowl at 2 pints per acre was broadcast on March 19 and lightly incorporated with a disk harrow. The entire study area was bedded on March 19. The experimental design was a randomized complete block with four replications. Plots for individual rotation sequences consisted of eight rows on 38-inch centers that were 30 feet in length.

Production Methods–Corn: The experimental design for corn was a split plot with crop sequence as the whole plot and a soil insecticide/nematicide treatment as the split plot. Individual four-row subplots received either 6.5 pounds per acre of Counter 15G in-furrow or served as a non-treated control. On March 30, the corn variety DeKalb 69-71 was planted. On April 29, 42 gallons per acre of 28 percent N-Sol (130-0-0) was broadcast. A post-directed application of Roundup Weathermax at 22 fluid ounces per acre + Atrazine at 1 quart per acre was made on June 5. Corn was combined on August 9.

Production Methods–Cotton: The cotton variety DP 1048 was planted at a rate of three seed per row foot on May 12. Thrips and seedling disease control was provided by in-furrow applications of 5 pounds per acre of Temik 15G and 7 pounds per acre of Terraclor 10G, respectively. Prowl at 1 quart per acre + Roundup Weathermax at 1 quart per acre was broadcast at planting on May 12. Early postbroadcast applications of Staple LX at 3 fluid ounces per acre + Induce at 2 quarts per 100 gallons of spray volume on May 28 and Roundup Weathermax at 22 fluid ounces per acre on June 9 were followed by a postdirect application of Caparol (promethryne) at 1.5 pints per acre + MSMA at 2.5 pints per acre + Induce at 2 quarts per 100 gallons of spray volume on July 9. The plant growth regulator Pix at 10 fluid ounces per acre + Induce at 2 quarts per 100 gallons of spray volume was applied to cotton on June 17 and July 7. Cotton was prepared for harvest with an application of Diuron at 1 ounce per acre + Dropp 50W at 2 ounces per acre + Prep at 1 quart per acre + Crop Oil at 1 quart per 100 gallons of spray volume on September 9. Cotton plots were picked on September 29.

Production Methods–Peanut: The experimental design for peanut was a split plot with crop sequence as the whole plot and a soil fungicide treatment as the split plot. Individual four-row subplots received either a broadcast application of 1 pint per acre of Convoy on August 4 and September 2 or served as a non-treated control. The peanut cultivar Georgia Greener was planted on May 20 with 7 pounds per acre of Temik 15G placed in-furrow for thrips control. Weed control was obtained with an application of Gramoxone Inteon at 8 fluid ounces per acre + Storm 4L at 1 pint per acre + Induce at 1 quart per 100 gallons of spray volume on June 9. A tank mixture of Cadre at 2 ounces per acre + Strongarm at 0.225 ounce per acre + Induce at 2 quarts per 100 gallons of spray volume was broadcast on July 2. Full canopy sprays of Bravo Weather Stik 6F at 1.5 pints per acre were made for leaf spot and rust control using an ATV-mounted boom sprayer with three TX-8 nozzles per row at 10 gallons of spray volume per acre at 45 psi on July 1, July 13, July 29, August 9, August 26, September 7, and September 22. Peanut plots were inverted on October 7. Pod yields were reported at 10 percent moisture.

Disease and Nematode Assessment: The occurrence of foliar diseases in corn was visually assessed on June 24 on the ear leaf using a 0 to 10 scale (0 = no disease, 1 = 1 to 10 percent, 2 = 11 to 20 percent, 3 = 21 to 30 percent, 4 = 31 to 40 percent, etc. of leaf area diseased). In peanuts, tomato spotted wilt (TSWV) hit counts (one hit was defined as ≤ 1 foot of consecutive TSWV-damaged plants per row) and white mold hit counts (one hit was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made on September 9 and October 7, respectively. Early and late leaf spot were rated on October 7 using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease, 2 = very few lesions in canopy, 3 = few lesions noticed in lower and upper canopy, 4 = some le(1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). Soil samples for a nematode assay from were collected for corn plots on September 2 and peanut and cotton plots on October 31 but have not yet been processed.

Results–Corn: The cropping sequence, but not the Counter 15G soil insecticide/nematicide treatment, had a significant impact on root knot juvenile number and corn yield (Table 1). As indicated by the non-significant cropping sequence x soil insecticide interaction, Counter 15G soil insecticide/nematicide had no impact on corn yield regardless of cropping sequence, so the data for this variable were pooled. Similar root knot juvenile counts and yields for the Counter 15G-treated corn and for the non-treated control indicate that very little soil insect or nematode-related damage to the roots occurred (Table 2). Highest root knot juvenile counts were reported for the cotton-cotton-corn rotation pattern. Otherwise, cropping sequence did not significantly impact root knot juvenile counts. Yield for the continuous corn (corn-corn-corn) was significantly lower compared with all other cropping sequences except for cotton-corn-corn-corn (Table 3). Equally high yields were noted for the corn behind one-year peanut or cotton or cotton-corn-corn and peanut-corn-corn sequences. While light southern rust injury was noted, yield was not affected.

TABLE 1. ANOVA TABLE FOR MAIN AND SUBPLOT TREATMENT EFFECTS FOR CORN

Split plot analysis *P*(F value)	Root knot	Yield
Cropping sequence	0.0415*[1]	0.0027**
Soil insecticide	0.1955	0.6421
Cropping sequence x soil insecticide	0.7512	0.6994

[1] Significance at the 0.05 and 0.01 levels is indicated by * and **, respectively.

TABLE 2. CORN YIELD ACROSS ALL CROPPING SEQUENCES AS INFLUENCE BY COUNTER 15G INSECTICIDE/NEMATICIDE

Treatment and rate/A	Root knot [1]	Yield *bu/A*
Counter 15G 6.5 lb	43 a	129 a
Non-treated control	78 a	130 a

[1] Root knot nematode juvenile counts are expressed at the number of nematodes per 100 cc soil.
Means in each column that are followed by the same letter are not significantly different according to the least significant difference (LSD) test (*P*=0.05).

Results–Peanut: Cropping sequence significantly influenced leaf spot intensity and yield, and the soil fungicide Convoy treatment significantly impacted white mold incidence but not leaf spot intensity and yield (Table 4). The non-significant cropping sequence x soil fungicide interaction for leaf spot, white mold, and yield shows that the impact of the Convoy soil fungicide treatment on each of these variables was similar regardless of cropping sequence, so the data for each variable were pooled for presentation in Tables 5 and 6.

Leaf spot intensity and yields for both the Convoy treatment and the non-treated controls did not significantly differ (Table 5). As expected, white mold incidence was lower for the Convoy treatment than the non-treated controls.

Leaf spot intensity, white mold incidence, and yield, but not TSWV incidence, were impacted by cropping sequence (Table 6). Leaf spot intensity and TSWV

TABLE 3. IMPACT OF CROPPING SEQUENCE ON THE YIELD OF CORN

Crop sequence								Root knot [1]	Yield
2003	2004	2005	2006	2007	2008	2009	2010		*bu/A*
Corn	Corn	Corn	Corn	Corn	Corn	Corn	Corn	9 b	118 c
Pnut	Corn	Pnut	Corn	Pnut	Corn	Pnut	Corn	14 b	136 a
Corn	Corn	Pnut	Corn	Corn	Pnut	Corn	Corn	58 b	129 ab
Cotton	Corn	Cotton	Corn	Cotton	Corn	Cotton	Corn	38 b	135 a
Cotton	Corn	Corn	Cotton	Corn	Corn	Cotton	Corn	52 b	128 ab
Cotton	Corn	Corn	Corn	Cotton	Corn	Corn	Corn	91 ab	125 bc
Cotton	Cotton	Cotton	Corn	Cotton	Cotton	Cotton	Corn	163 a	133 ab

[1] Number of root knot nematode juveniles per 100 cc of soil.
Means that are in each column that are followed by the same letter are not significantly different according to Fisher's least significant difference (LSD) test (*P*≤0.05).

incident were high for continuous peanuts as well as the corn-peanut-peanut, cotton-peanut-peanuts, peanut following one year of corn, and two years of peanuts. The lowest leaf spotting and premature defoliation due to late leaf spot and TSWV incidence was recorded on peanut following three years of cotton or corn as well as peanut cropped behind one year of corn. When compared with the other rotation patterns, continuous peanuts as well as corn-peanut-peanut and cotton-peanut-peanut cropping sequence had the highest white mold hit counts. Continuous peanuts and peanut cropped behind one year of cotton and two years of peanut had lower white mold ratings compared with peanut following one year of cotton. Highest yields were recorded for the peanut cropped after three years of cotton or corn, while the continuous peanuts and peanut behind one year of cotton and peanut had the lowest yields.

Results–Cotton: With one exception, seed cotton yields for all cropping sequences were similar (Table 7). Cotton following one year of corn and then cotton had lower yields than cotton cropped behind peanut and then cotton.

Summary: With corn and peanut, but not cotton, yield was often higher when the preceding crop was different. Lowest yields were most often seen with a corn or peanut monoculture. With corn, reduced yields were not associated with increased foliar or soil disease activity. In fact, over the study period, disease activity in corn was minimal regardless of the cropping sequence. For peanut, declining yields associated with increased peanut cropping frequency were directly tied to intensification of leaf spotting and premature defoliation due to late leaf spot and, in some years, higher incidence of white mold. In 2010, peanut cropping frequency significantly influenced TSWV incidence. Regardless of cropping sequence, serious disease and nematode problems have not developed in cotton nor has peanut root knot nematode emerged as an issue. As a result, yields have remained just as high for the continuous cotton as for other sequences where cotton followed two or three years of either peanut or corn.

TABLE 4. ANOVA TABLE FOR MAIN AND SUBPLOT EFFECTS ON PEANUT

Split plot analysis *P*(F value)	LS [1]	WM [1]	Yield
Cropping sequence	0.0071**[2]	0.0002***	0.0003***
Soil fungicide	0.6070	0.0025**	0.5608
Cropping sequence x soil fungicide	0.8494	0.2963	0.4304

[1] Leaf spot (LS) and white mold (WM)

[2] Significance at the 0.05 and 0.01 levels is indicated by * and **, respectively.

TABLE 5. IMPACT OF CONVOY SOIL FUNGICIDE ON LEAF SPOT AND WHITE MOLD RATINGS AND YIELD, 2010

Split plot analysis *P*(F value)	LS [1]	WM [2]	Yield
Convoy	4.5 a	5.0 b	4312 a
Non-treated Control	4.5 a	9.0 a	4255 a

[1] Early leaf spot (LS) was rated using the Florida 1 to 10 scoring system.

[2] White mold (WM) incidence is expressed as number of hits per 60 foot of row.

Means in each column that are followed by the same letter are not significantly different according to Fisher's least significant difference (LSD) test ($P \leq 0.05$).

TABLE 6. IMPACT OF CROP ROTATION ON THE LEVEL OF DAMAGE ATTRIBUTED TO DISEASES IN PEANUT IN 2010

Crop sequence 2003	2004	2005	2006	2007	2008	2009	2010	TSWV[1]	LS [2]	WM [1]	Yield *lb/A*
Pnut	Pnut	Pnut	Pnut	Pnut	Pnut	Pnut	Pnut	10.0 ab	5.3 a	11.8 a	3738 d
Corn	Pnut	Corn	Pnut	Corn	Pnut	Corn	Pnut	6.6 cd	4.0 cd	3.4 b	4443 bc
Pnut	Pnut	Corn	Pnut	Pnut	Corn	Pnut	Pnut	8.8 bc	4.8 ab	11.1 a	4116 c
Corn	Corn	Corn	Pnut	Corn	Corn	Corn	Pnut	4.6 d	3.9 d	2.6 b	4924 a
Pnut	Pnut	Cttn	Pnut	Pnut	Cttn	Pnut	Pnut	12.3 a	5.3 a	12.6 a	3634 d
Cttn	Pnut	Cttn	Pnut	Cttn	Pnut	Cttn	Pnut	6.6 cd	4.6 bc	4.6 b	4362 c
Cttn	Cttn	Cttn	Pnut	Cttn	Cttn	Cttn	Pnut	3.9 d	3.6 d	2.6 b	4769 ab

[1] Tomato spotted wilt (TSWV) and white mold (WM) incidence is expressed as number of hits per 60 foot of row.

[2] Early leaf spot (LS) was rated using the Florida 1 to 10 scoring system.

Means that are inE each column that are followed by the same letter are not significantly different according to Fisher's least significant difference (LSD) test ($P \leq 0.05$).

TABLE 7. IMPACT OF CROP SEQUENCE ON COTTON YIELD

Crop sequence 2003	2004	2005	2006	2007	2008	2009	2010	Yield *lb/A*
Cotton	Cotton	Cotton	Cotton	Cotton	Cotton	Cotton	Cotton	2843 ab
Peanut	Cotton	Peanut	Cotton	Peanut	Cotton	Peanut	Cotton	2875 ab
Cotton	Cotton	Peanut	Cotton	Cotton	Peanut	Cotton	Cotton	3113 a
Cotton	Cotton	Peanut	Cotton	Cotton	Peanut	Cotton	Cotton	2823 ab
Cotton	Cotton	Corn	Cotton	Cotton	Corn	Cotton	Cotton	2522 b

Means that are in each column that are followed by the same letter are not significantly different according to Fisher's least significant difference (LSD) test ($P \leq 0.05$).

DISEASE RESISTANCE AND YIELD RESPONSE OF COMMERCIAL RUNNER PEANUT CULTIVARS IN CENTRAL ALABAMA, PBU

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Objective: To assess the yield response and reaction to early leaf spot and stem rot of runner-market type peanuts planted in central Alabama.

Production Methods: The test site at the E.V. Smith Research Center, Plant breeding Unit, in Tallassee, Alabama, was first cropped to peanut in 2009. The site was paratilled and then disked prior to sowing runner-market type peanut cultivars at a rate of six seed per foot of row in an Independence (Cahaba) loamy fine sand (organic matter <1 percent) on May 24. Weed control was obtained with a preplant application of Pendant at 1.5 pints per acre + Dual Magnum II at 1 pint per acre on May 24. Thips control was obtained with an in-furrow application of Temik 15G at 7 pounds per acre. A hose-tow irrigation system was used to apply 0.5, 0.7, 0.8, 0.9, and 1.0 acre inches of water on June 29, July 13, August 13, September 17, and September 20, respectively. Plots, which contained four 30-foot rows spaced 3 feet apart, were arranged in a randomized complete block with six replications. To control leaf spot diseases, full canopy applications of Echo 720 6F at 24 fluid ounces per acre were made on June 24, July 8, July 23, August 5, August 23, and September 2 with a four-row, tractor-mounted sprayer.

Disease Assessment: Early leaf spot was rated on October 12, using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one locus was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made immediately after plot inversion on October 12. Yields were reported at 10 percent moisture. Significance of treatment effects was tested by analysis of variance and the least significant difference (LSD) test ($P \leq 0.05$).

Results: While rainfall totals were below to well below the historical average through most of the summer months, temperatures were above to well-above average throughout most of the summer of 2010. As a result, early leaf spot intensity was reduced, while white mold incidence increased to levels not seen in previous years. Early leaf spot ratings for Georgia-07W, Georgia Greener, and Tifguard, but not Florida 07, Georgia-02C, and Georgia-06G, were significantly lower when compared with the industry standard Georgia Green (Table 1). In addition, white mold incidence was higher on Georgia Green when compared with all other cultivars except for Georgia-06G. Equally low stem rot ratings were recorded for Georgia-02C, Georgia-07W, and Tifguard. Yields recorded for Georgia-06G and Georgia-07W were higher than for Georgia Green, Tifguard, and Georgia-02C but similar to Florida 07 and Georgia Greener. Peanut cultivars with the lowest yield included Georgia-02C, Tifguard, and Georgia Green.

DISEASE RATINGS AND YIELD FOR SELECTED RUNNER TYPE PEANUT CULTIVARS, PBU

Peanut cultivar	LS [1]	WM [2]	Yield *(lb/A)*
Florida 07	4.4 ab	4.1 bc	3673 ab
Georgia-02C	4.5 ab	1.5 d	2859 d
Georgia-06G	4.3 abc	5.8 ab	3749 a
Georgia 07W	4.2 bc	2.0 cd	3747 a
Georgia Green	4.8 a	7.8 a	3289 bcd
Georgia Greener	3.9 cd	5.0 b	3358 abc
Tifguard	3.7 d	4.0 bcd	3115 cd

[1] Early leaf spot (LS) was rated using the Florida 1 to 10 peanut leaf spot rating scale.

[2] White mold (WM) incidence is expressed as the number of disease loci per 60 ft of row.

Means in each column that are followed by the same letter are not significantly different according Fisher's least significant difference (LSD) test ($P \leq 0.05$).

Summary: While Georgia-06G and Georgia-07W did not have consistently low ratings for early leaf spot and white mold, both cultivars had higher yields compared with most of the other runner-type peanut cultivars. The late maturing Georgia-02C produced the lowest yield.

RECOMMENDED FUNGICIDE PROGRAMS EVALUATED FOR THE CONTROL OF EARLY LEAF SPOT AND WHITE MOLD ON PEANUT, PBU

A. K. Hagan, H. L. Campbell, K. L. Bowen, and S. P. Nightengale

Objective: To assess the effectiveness of recommended fungicide programs for the control of early leaf spot and white mold on peanut and their impact on peanut yield in central Alabama.

Production Methods: The site at the E.V. Smith Research Center, Plant breeding Unit, in Tallassee, Alabama, was first cropped to peanut in 2009. The site was paratilled and then disked prior to sowing the runner-market type peanut cultivars Georgia-06G and Tifguard at a rate of six seed per foot of row in an Independence (Cahaba) loamy fine sand (organic matter <1 percent) on May 24. Weed control was obtained with a preplant application of Pendant at 1.5 pints per acre + Dual Magnum II at 1 pint per acre on May 24. Thips were controlled with an in-furrow application of Temik 15G at 7 pounds per acre. A hose-tow irrigation system was used to apply 0.5, 0.7, 0.8, 0.9, and 1.0 acre inches of water on June 29, July 13, August 13, September 17, and September 20, respectively. A split plot design with cultivar as whole plot and fungicide treatments as subplots was used. Individual subplots, which contained four 30-foot rows spaced 3 feet apart, were randomized within main plots which were replicated four times. Fungicide treatments were applied on 1 = June 24, 2 = July 8, 3 = July 22, 4 = August 5, 5 = August 19, 6 = September 2, and 7 = September 16 with a four-row, tractor-mounted sprayer.

Disease Assessment: Early leaf spot (ELS) severity was rated on October 12 using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few lesions on leaves in canopy; 3 = few lesions noticed on leaves in lower and upper canopy; 4 = some lesions on leaves throughout canopy and ≤ 10 percent defoliation; 5 = lesions noticeable and ≤ 25 percent defoliation; 6 = lesions numerous and ≤ 50 percent defoliation; 7 = lesions very numerous and ≤ 75 percent defoliation; 8 = numerous lesions on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with lesions and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold counts (one hit was defined as ≤ 1 foot of consecutive stem rot damaged plants per row) were made immediately after plot inversion on October 12. Yields were reported at 10 percent moisture. Significance of treatment effects was tested by analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

Results: While rainfall totals were below to well below the historical average through most of the summer 2010, temperatures were often above average. As a result, early leaf spot intensity was lower but white mold incidence increased over levels seen in previous years. Since the cultivar x fungicide treatment interaction for early leaf spot intensity was significant (Table 1), data for this variable are displayed in Table 2 by peanut cultivar. In contrast the cultivar x fungicide treatment interactions for white mold and yield were not significant, so data were averaged across peanut cultivars (Table 3). Overall, no differences in the leaf spot or white mold ratings or in yield were noted between Georgia-06G and Tifguard (Table 1).

On Tifguard and Georgia Green, poorest control of early leaf spot was obtained with the Equus 720 season-long and the Equus/Convoy + Equus programs (Table 2). The Equus/Artisan 3.6E + Equus 720 program was as equally ineffective as the Equus 720 season-long and the Equus/Convoy + Equus programs on Tifguard but proved among the more efficacious treatments for controlling early leaf spot on Georgia Green. Both the Provost 433SC and Headline 2.09E programs proved equally effective on Georgia-06G and Tifguard in controlling early leaf spot.

White mold incidence was higher with Equus 720/Headline 2.09E compared with all other programs except for Equus 720 alone. In contrast, both rates of Equus 720/Provost 433SC, Equus/Folicur 3.6F + Equus 720, and Equus/Convoy + Equus 720 programs not only gave superior white mold control but also had higher yields when compared with the season-long Equus 720 program. Equus/Provost 433SC (10.7 fluid ounces per acre), Equus/Convoy + Equus 720, and Equus/Folicur 3.6F + Equus 720 programs produced equally high yields.

Summary: Lower leaf spot pressure compared with the previous year can be attributed to drier than normal late summer weather patterns. Both Equus/Provost 433SC as well as the Equus/Folicur 3.6F + Equus 720, and Equus/Convoy + Equus 720 programs not only gave superior control of both early leaf spot and white mold but also had among the

highest yields. While better leaf spot control was obtained with Equus/Artisan 3.6E + Equus 720 on Georgia-06G when compared with Tifguard, this program did not prove highly effective in controlling white mold on peanut and yield response was similar to the season-long Equus 720 program. While effective for controlling early leaf spot, the Equus/Headline 2.09E program had less effective control of white mold and a lower yield response than the Equus/Provost 433SC at 10.7 fluid ounces per acre, the Equus/Folicur 3.6F + Equus 720, and the Equus/Convoy + Equus 720 programs.

TABLE 1. ANOVA TABLE FOR MAIN AND SUBPLOT TREATMENT EFFECTS

	LS [1]	WM [2]	Yield *lb/A*
Source			
Peanut cultivar	0.1328	0.1151	0.7231
Fungicide	<0.0001*** [3]	<0.0001***	0.0007***
Cultivar x fungicide	0.0031**	0.6185	0.6059
Peanut cultivar			
Georgia-06G	2.9 a	3.8 a	3886 a
Tifguard	3.1 a	3.1 a	3805 a

[1] Early leaf spot (LS) was rated using the Florida 1 to 10 peanut leaf spot rating scale.
[2] White mold severity is expressed as the number of disease hits per 60 ft of row.
[3] Significance at the 0.05, 0.01, and 0.001 levels is indicated by *, **, or ***, respectively.
Means in each column for each variable that are followed by the same letter are not significantly different according to analysis of variance and the least significant difference (LSD) test ($P≤0.05$).

TABLE 2. CONTROL OF EARLY LEAF SPOT WITH RECOMMENDED FUNGICIDES ON TWO PEANUT CULTIVARS

Treatment and rate/A	LS intensity[1]	
	Tifguard	Georgia-06G
Equus 720 1.5 pt	3.5 ab	4.1 ab
Equus 720 1.5 pt Provost 433SC 8 fl oz	2.8 cd	1.8 e
Equus 720 1.5 pt Provost 433SC 10.7 fl oz	2.5 d	2.0 de
Equus 720 1.5 pt Artisan 3.6E 26 fl oz + Equus 720 1.5 pt	3.5 ab	2.8 cd
Equus 720 1.5 pt Convoy 1 pt + Equus 720 1.5 pt	4.0 a	4.5 a
Equus 720 1.5 pt Headline 2.09E 9 fl oz	2.5 d	1.6 e
Equus 720 1.5 pt Folicur 3.6F + Equus 720 1.5 pt	3.3. bc	3.5 bc

[1] Early leaf spot (LS) was rated using the Florida 1 to 10 peanut leaf spot rating scale.
Means in each column that are followed by the same letter are not significantly different according to the least significant difference (LSD) test ($P≤0.05$).

TABLE 3. WHITE MOLD CONTROL AND YIELD RESPONSE WITH RECOMMENDED FUNGICIDE PROGRAMS

Fungicide and rate	Application timing	WM [1]	Yield *lb/A*
Equus 720 1.5 pt	1-7	5.8 ab	3494 c
Equus 720 1.5 pt	1,2,7	2.3 cd	3868 b
Provost 433SC 8 fl oz	3,4,5,6		
Equus 720 1.5 pt	1,2,7	1.4 d	3953 ab
Provost 433SC 10.7 fl oz	3,4,5,6		
Equus 720 1.5 pt	1,2,4,6,7	4.0 bc	3732 bc
Artisan 3.6E 26 fl oz + Equus 720 1.5 pt	3,5		
Equus 720 1.5 pt	1,2,4,6,7	2.3 cd	4198 a
Convoy 1 pt + Equus 720 1.5 pt	3,5		
Equus 720 1.5 pt	1,2,4,6,7	6.6 a	3711 bc
Headline 2.09E 9 fl oz	3,5		
Equus 720 1.5 pt	1,2,4,6,7	1.9 d	3962 ab
Folicur 3.6F + Equus 720 1.5 pt	3,5		

[1] White mold rot (WM) severity is expressed as the number of disease hits per 60 ft of row.
Means in each column that are followed by the same letter are not significantly different according Fisher's least significant difference (LSD) test ($P≤0.05$).

YIELD RESPONSE AND REACTION OF COMMERCIAL PEANUT CULTIVARS TO TOMATO SPOTTED WILT, EARLY LEAF SPOT AND WHITE MOLD, BARU

A. K. Hagan, H. L. Campbell, and J. R. Akridge

Objective: To evaluate the reaction of commercial runner peanut cultivars to tomato spotted wilt (TSWV), leaf spot diseases, and white mold and the impact of those diseases on yield in south-central Alabama.

Production Methods: Rows were laid out on April 30 at the study site at the Brewton Agricultural Research Unit in Brewton, Alabama, with a KMC subsoiler + coulter + rolling basket rig, and Prowl at 2 pints per acre was broadcast and incorporated. On June 14, commercial runner peanut lines were planted at a rate of approximately six seed per foot of row in a field that was cropped to peanut the previous year using conventional-tillage practices in a Benndale sandy loam soil (organic matter <1 percent). Weed control was obtained with a broadcast application of Dual Magnum II at 1.3 pints per acre on June 14. Escape weeds were plowed with flat sweeps or pulled by hand. Plots that consisted of four 30-foot rows spaced 3 feet apart were arranged in a randomized complete block with six replications. Full canopy sprays of 1.5 pints per acre of Echo 720 6F were applied on July 21, August 4, August 23, September 2, and September 21 with a tractor-mounted boom sprayer with three TX-8 nozzles per row calibrated to deliver 15 gallons per acre spray volume at 45 psi.

Disease Assessment: Final TSWV hit counts (one hit was defined as ≤ 1 foot of consecutive severely TSWV-damaged plants per row) were made on September 29. Early leaf spot was rated October 17 using the 1 to 10 Florida peanut leaf spot scoring system(1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive white mold-damaged plants per row) were made immediately after plot inversion on October 19. Yields were reported at 7 percent moisture. Significance of treatment effects was tested by analysis of variance and least significant difference (LSD) test ($P \leq 0.05$).

Results: With the exception of August, monthly rainfall totals during the study period were below to well below the 30-year historical average for the study site, while temperatures were often above normal. Significant differences in TSWV and white mold intensity as well as early leaf spot severity were noted between peanut cultivars (Table 1). Highest TSWV incidence was recorded in Georgia Green, while equally low disease levels were found in Georgia-07W, Tifguard, and Florida 07. Equally high early leaf spot severity ratings were noted for Georgia Green, Florida 07, and Georgia Greener, while similarly low disease levels were seen on Tifguard, Georgia-07W, and Georgia-06G. White mold incidence was significantly lower on Georgia-07W compared with Georgia Green, Georgia Greener, and Tifguard. Georgia Green, which had among the highest ratings for TSWV, early leaf spot, and white mold, also had lower yields than all cultivars except for Tifguard. Georgia-06G, Georgia-07W, Georgia Greener, and Florida 07 had equally high yields.

Summary: Low yield for Georgia Green reflects a combination of higher TSWV and early leaf spot damage when compared with the other runner peanut lines. Equally high yields were recorded for Georgia-06G, Georgia-07W, Georgia Greener, and Florida 07.

DISEASE RATINGS AND YIELD FOR COMMERCIAL RUNNER-TYPE PEANUT CULTIVARS, BARU

Peanut cultivar	TSWV [1]	LS [2]	Stem rot [1]	Yield *lb/A*
Georgia-07W	0.3 c	2.9 bc	1.3 b	3560 ab
Georgia-06G	2.5 b	3.1 bc	4.7 ab	3792 a
Tifguard	2.0 bc	2.6 c	5.3 a	3439 bc
Georgia Green	6.3 a	4.1 a	7.7 a	3235 c
Georgia Greener	3.0 b	3.3 abc	6.0 a	3571 ab
Florida 07	2.0 bc	3.8 ab	4.0 ab	3605 ab

[1] TSWV (tomato spotted wilt) incidence is expressed as the number of hits per 60 ft of row.
[2] Early leaf spot (LS) was rated using the Florida 1 to 10 leaf spot rating scale.
Means followed by the same letter in each column are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

DISEASE RESPONSE AND YIELDS OF IRRIGATED RUNNER-TYPE COMMERCIAL PEANUT CULTIVARS, WREC

A. K. Hagan, H. L. Campbell, and K. L. Bowen, and B. E. Gamble

Objective: To compare the yield potential of commercial peanut cultivars and advanced breeding lines as well as their reaction to tomato spotted wilt virus (TSWV), leaf spot diseases, and white mold in an irrigated production system in southeast Alabama.

Production Methods: Rows were laid off on April 27 at the Wiregrass Research and Extension Center in Headland, Alabama, with a KMC strip till rig with rolling baskets after the tier had been prepared for planting with a moldboard plot and disk harrow on March 15. Commercial peanut cultivars and advanced breeding lines were planted on May 13 at a rate of approximately six seed per foot of row in a field that was cropped the previous two years to cotton using conventional tillage practices in a fine Dothan sandy loam (organic matter <1 percent). Gypsum at a rate of 600 pounds per treated acre was applied on a 14-inch band over the row middle on June 24. A preplant application of 1 quart per acre of Sonalan and 0.45 ounce per acre of Strongarm on April 19 was lightly incorporated. Escape weeds were plowed with flat sweeps on June 14 and June 24 or pulled by hand. Temik 15G at 6.5 pounds per acre was placed in-furrow to control thrips. The study site was irrigated with 0.75 and 1.0 acre inches of water on July 12, July 26, August 3, August 11, August 25, September 9, September 13, and September 21. Chlorothalonil at 1.5 pints per acre was applied on June 9, June 21, July 19, August 17, and August 30, while Abound 2SC at 18.5 fluid ounces per acre was broadcast on July 7 and August 2. Plots that consisted of two 20-foot rows spaced 3 feet apart were arranged in a randomized complete block with four replications.

Disease Assessment: TSWV hit counts (one hit was defined as ≤ 1 foot of consecutive severely TSWV-damaged plants per row) were made on September 8, September 17, and September 24 for the early, mid-season, and late maturing peanut cultivars, respectively. Early and late leaf spot (LS) were rated together on September 17, September 24, and October 1 for the early, mid-season, and late maturing cultivars, respectively, using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). White mold hit counts (one hit was defined as ≤ 1 foot of consecutive stem rot damaged plants per row) were made immediately after plot inversion on September 17, September 24, and October 1 for the early, mid-season, and late maturing cultivars, respectively. Yields were reported at 7 percent moisture. Significance of treatment effects was tested by analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

Results: With the exception of August, monthly rainfall totals during the study period were below to well below the 30-year historical average for the study site, while temperatures were often above normal. These conditions resulted in reduced leaf spot intensity but did not impact the incidence of TSWV or white mold.

Significant differences in leaf spot intensity, TSWV and white mold incidence, and yield were noted among peanut cultivars and breeding lines. While highest TSWV incidence was noted in Georgia-09B—the current industry standard—Georgia Green, Georgia-08V, Georgia-06G, and AT215 had equally high ratings for this disease. Disease incidence in six additional peanut cultivars was as low as the levels noted in Florida 07 and Georgia-07W. Similarly high leaf spot ratings were recorded for Georgia-08V, EXP 27-1516, and Florida 07, while Georgia Greener, Tifguard, and C-724-19-25 had equally low leaf spot ratings. White mold incidence on all cultivars except for C-724-19-25, Florida 07, Georgia-02C, and Georgia-07W was similar to Georgia Green, which had the highest rating for this disease. Yield for Georgia-07W was higher than all cultivars except for C-724-19-25, Florida 07, Georgia-06G, Georgia-08V, Georgia-09B, Georgia Greener, and Tifguard. Yields of Georgia-02C, Georgia Green, and AP-4 were equally low.

Summary: Georgia 07W, Florida 07, and Tifguard had higher yields and lower TSWV ratings compared with the current industry standard Georgia Green. While Georgia-09B had similar TSWV ratings as Georgia Green, yield of Georgia-09Bwas higher.

DISEASE RATINGS AND YIELD FOR COMMERCIAL PEANUT CULTIVARS AND ADVANCED BREEDING LINES IN AN IRRIGATED PRODUCTION SYSTEM, WREC

Peanut cultivar	Maturity	TSWV [1]	LS [2]	WM [1]	Yield (*lb/A*)
AP-4	Mid	6.0 cd	4.0 bc	3.0 ab	4392 e
AT 215	Early	9.7 abc	4.0 bc	1.0 ab	5245 cd
C-724-19-25	Mid	5.3 cd	3.4 de	0.5 b	5790 abc
EXP 27-1516	Mid	8.0 bcd	4.4 ab	1.0 ab	5318 bcd
Florida 07	Late	5.3 d	4.1 abc	0.3 b	5745 ab
Georgia-02C	Late	5.5 cd	3.9 bcd	0.3 b	4755 de
Georgia-06G	Mid	9.0 abc	4.0 bc	2.5 ab	5792 abc
Georgia-07W	Mid	3.8 d	3.8 cd	0.3 b	6031 a
Georgia-08V	Mid	13.0 ab	5.0 a	1.8 ab	5457 abc
Georgia-09B	Mid	17.5 a	3.8 cd	1.8 ab	5629 ab
Georgia Green	Mid	14.8 ab	3.8 cd	4.3 a	4916 cde
Georgia Greener	Mid	6.0 cd	3.0 e	1.3 ab	5830 abc
Tifguard	Mid	5.3 d	3.4 de	1.0 ab	5666 ab

[1] Tomato spotted wilt (TSWV) and white mold (WM) incidence is expressed as the number of disease hits per 40 foot of row.
[2] Leaf spot (LS) severity was rated using the 1 to 10 Florida leaf spot scoring system.
Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

DISEASE RESPONSE AND YIELDS OF IRRIGATED VIRGINIA AND RUNNER-TYPE EXPERIMENTAL PEANUT LINES, WREC

A. K. Hagan, H. L. Campbell, K. L. Bowen, and B. E. Gamble

Objective: To compare the yield potential of advanced breeding lines with selected commercial runner-type peanut cultivars as well as their response to tomato spotted wilt virus (TSWV), leaf spot diseases, and white mold in an irrigated production system in southeast Alabama.

Production Methods: Rows were laid off at the Wiregrass Research and Extension Center in Headland, Alabama, on April 27 with a KMC strip till rig with rolling baskets and peanuts planted on May 14 at a rate of approximately six seed per foot of row in a field that was cropped the previous two years to cotton using conventional tillage practices in a fine Dothan sandy loam (organic matter <1 percent). Gypsum, at a rate of 600 pounds per treated acre was applied on a 14-inch band over the row middle on June 24. A preplant application of 1 quart per acre of Sonalan and 0.45 ounce per acre of Strongarm on April 19 was lightly incorporated. Escape weeds were plowed with flat sweeps on June 14 and June 24 or pulled by hand. Temik 15G at 6.5 pounds per acre was placed in-furrow to control thrips. The study site received between 0.75 and 1.0 acre inches of water on July 12, July 26, August 3, August 11, August 25, September 9, September 13, and September 21. Generic chlorothalonil at 1.5 pints per acre was applied on June 9, June 21, July 19, August 17, August 30, while Abound 2SC at 18.5 fluid ounces per acre was broadcast on July 7 and August 2. Plots that consisted of two 20-foot rows spaced 3 feet apart were arranged in a randomized complete block with four replications.

Disease Assessment: Final tomato spotted wilt virus (TSWV) hit counts (one hit was defined as ≤ 1 foot of consecutive severely TSWV-damaged plants per row) were made on September 8, September 17, September 24, and October 1 for the early, mid-season, late, and very late maturing cultivars, respectively. Late leaf spot (LS) was rated on September 17, September 24, October 1, and October 8 for the early, mid-season, late, and very late maturing cultivars, respectively, using the 1 to 10 Florida peanut leaf spot scoring system (1 = no disease; 2 = very few leaf spots in canopy; 3 = few leaf spots noticed in lower and upper canopy; 4 = some leaf spotting in canopy and ≤ 10 percent defoliation; 5 = leaf spot noticeable and ≤ 25 percent defoliation; 6 = leaf spots numerous and ≤ 50 percent defoliation; 7 = leaf spots very numerous and ≤ 75 percent defoliation; 8 = numerous leaf spots on few remaining leaves and ≤ 90 percent defoliation; 9 = very few remaining leaves covered with leaf spots and ≤ 95 percent defoliation; and 10 = plants defoliated or dead). Stem rot (SR) loci counts (one locus was defined as ≤ 1 foot of consecutive stem rot damaged plants per row) were made immediately after plot inversion on September 22, October 8, October 21, and October 26 for the early, mid-season, late, and very late maturing cultivars, respectively. Yields were reported at 7 percent moisture. Significance of treatment effects was tested by analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

Results: With the exception of August, monthly rainfall totals during the study period were below to well below the 30-year historical average for the study site, while temperatures were often above normal, which resulted in reduced leaf spot intensity compared with previous years.

Significant differences in leaf spot intensity, TSWV and white mold incidence, and yields were noted among the advanced breeding lines. Breeding lines UF 10301, UF 10302, and UF 10303 had high TSWV ratings that were similar to the runner-type TSWV-susceptible standard Florunner. In contrast, TSWV incidence was lower in GA 072716 compared with all other breeding lines except for GA 052533, GA 072515, N05006, SEP 06-06, and the runner-market type, TSWV-resistant standard Florida 07. Early leaf intensity was higher on VT 024024 compared with all other peanut cultivars except for GA 072716. Equally low leaf spot ratings were recorded for GA 072515, UF 10302, N05006, N08081o1JC, and SEP 06-06. In addition, the runner-type standard Georgia-02C had higher leaf spot ratings than GA 072515 and UF 10302. While overall white mold pressure was low, Florunner had higher hit counts than N08081o1JC, EXP 27-1516, and UF 10302. Yields for EXP 27-1516, N05006, N08081o1JC, GA 072716, GA 072515, UF 10302, and UF 10301 were similar to those of the runner-type commercial standard

Florida 07 and Virginia-type commercial standard NC-7. Florunner, which had the highest TSWV and white mold disease ratings, also had the lowest yield.

Summary: With the exception of the UF breeding lines, many advanced breeding lines had TSWV levels that were significantly lower than the TSWV-susceptible control Florunner and similar to the TSWV-resistant commercial standard Florida 07. The advanced breeding lines GA 072515, UF 10302, N05006, N0808o1JC, SEP 06-06, and EXP 27-1516 also had lower leaf spot ratings than Florunner and Florida 07. Since white mold pressure was so low, no conclusion concerning cultivar reaction to this disease can be made. With a few exceptions, breeding lines with the lower TSWV, leaf spot, and white mold ratings had higher yields that matched those of the disease-resistant standard Florida 07.

DISEASE RATINGS AND YIELD FOR SELECTED COMMERCIAL PEANUT CULTIVARS AND ADVANCED BREEDING LINES IN AN IRRIGATED PRODUCTION SYSTEM, WREC

Peanut cultivar [1]	Maturity	TSWV [2]	LS [3]	WM [2]	Yield (*lb/A*)
NC-7	Early	7.0 cdef	4.3 bc	1.3 bcd	4959 abcd
Florunner	Mid	21.3 a	4.3 bc	3.5 a	3859 f
UF 10301	Late	13.5 abc	3.8 cdef	0.5 cd	5232 abc
UF 10302	Mid	14.7 ab	3.0 fg	2.5 ab	4866 abcd
UF 10303	Mid	10.3 abc	3.6 def	0.3 cd	4683 bcde
GA 052533	V Late	2.3 gh	4.1 cd	0.3 cd	4559 cdef
GA 072515	Mid	4.0 efgh	2.9 g	0.5 cd	5360 ab
GA 072716	Late	1.8 h	5.1 ab	0.3 cd	5413 ab
N05006	Early	4.0 efgh	3.5 efg	1.3 bcd	5413 ab
N08081o1JC	Mid	6.3 cdef	3.5 efg	2.0 abc	5323 ab
SEP 06-06	Late	3.8 fgh	3.6 defg	0.0 d	3942 ef
VT 024024	Early	8.3 bcd	6.1 a	1.3 bcd	4559 cdef
EXP 27-1516	Mid	6.5defg	3.6 cdef	1.8 abcd	5542 a
Florida 07	Late	4.0 fgh	4.1 cd	0.5 cd	5322 ab
Georgia-02C	Late	8.0 bcde	3.9 cde	0.0 d	4505 cdef

[1] With the exception of the Virginia-market type varieties NC-7, GA 052533, N05006, N09091o1JC, and VT 024024, the remaining peanut varieties are runner-type peanuts.
[2] Tomato spotted wilt (TSWV) and white mold (WM) incidence is expressed as the number of disease hits per 40 foot of row.
[3] Leaf spot (LS) severity was rated using the 1 to 10 Florida leaf spot scoring system.
Means in each column that are followed by the same letter are not significantly different according to analysis of variance and Fisher's protected least significant difference (LSD) test ($P \leq 0.05$).

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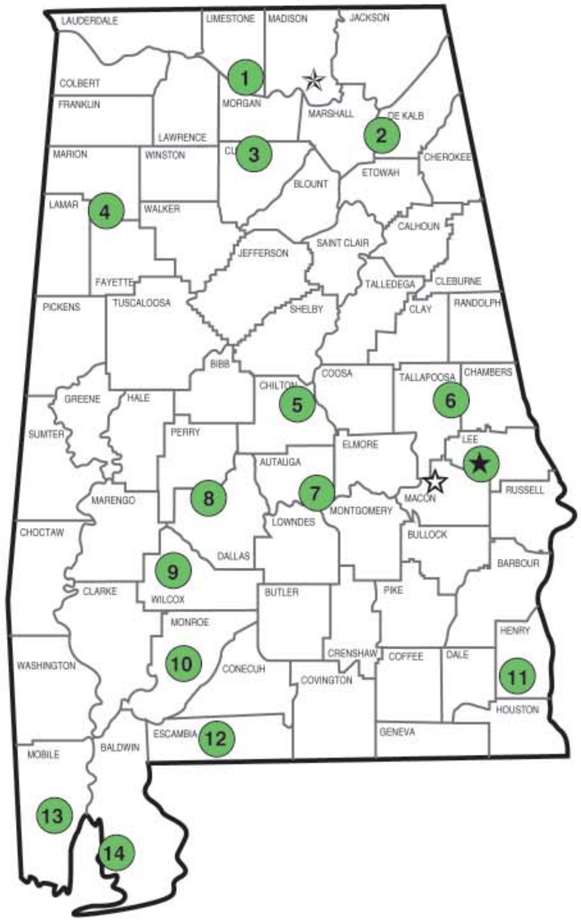

Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.
✯ Alabama A&M University.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Research and Extension Center, Belle Mina.
2. Sand Mountain Research and Extension Center, Crossville.
3. North Alabama Horticulture Research Center, Cullman.
4. Upper Coastal Plain Agricultural Research Center, Winfield.
5. Chilton Research and Extension Center, Clanton.
6. Piedmont Substation, Camp Hill.
7. Prattville Agricultural Research Unit, Prattville.
8. Black Belt Research and Extension Center, Marion Junction.
9. Lower Coastal Plain Substation, Camden.
10. Monroeville Agricultural Research Unit, Monroeville.
11. Wiregrass Research and Extension Center, Headland.
12. Brewton Agricultural Research Unit, Brewton.
13. Ornamental Horticulture Research Center, Spring Hill.
14. Gulf Coast Research and Extension Center, Fairhope.