

Final Grant Report
Fund 367363(APPA-RIA03-IM OF TSWV)
July 21, 2009

Title: Integrated Disease Management of Peanut

Project Leader (Alabama): Austin Hagan, Department of Entomology and Plant Pathology

Report: Studies were conducted to assess the efficacy of recommended fungicide programs for the control of diseases and their impact on the yield of peanut. Weather patterns through much of the 2009 production year were conducive to the development of leaf spot diseases in peanut throughout the state and rust in southwest Alabama. At the WGREC, highest leaf spot ratings were often recorded for the Folicur 3.6F and tebuconazole clone programs. In several trials, the most effective disease control and highest yield gains were obtained with the 8 fl oz/A rate of Provost 433SC. The standard Bravo Ultrex/Weather Stik as well as Abound 2SC and Headline 2.09EC programs gave consistently good control of early and late leaf spot. At the GCREC, the best combination of late leaf spot and rust control was given by the standard Bravo Weather Stik, Artisan 3.6E + Bravo Weather Stik, and Folicur 3.6F + Bravo Weather Stik programs. Unfortunately, the Artisan 3.6E + Bravo Weather Stik program also gave the least effective of these three programs in controlling white mold. The Evito program, which gave the poorest control of both of the above diseases, also had the lower yields than the more efficacious standard Bravo Weather Stik and Folicur 3.6F + Bravo Weather Stik programs. In the PBU study on Georgia Green and Georgia-06G, superior leaf spot provided by both rates of Provost 433SC as well as Headline 2.09E was rewarded with the highest pod yields. Efficacy of Echo 720, Artisan 3.6E + Echo 720, Echo 720 + Folicur 3.6F, Convoy + Echo 720 for the control of early leaf spot, which was poorer than expected, was reflected in lower yields. Performance of the Peanut Disease Risk Index fungicide programs was evaluated at two sites. When the efficacy of high and medium risk programs is compared at GCREC, Bravo Weather Stik alone gave better control of late leaf spot than either rate of Abound 2SC. In contrast, the level of rust control provided by Bravo Weather Stik and both rates of Abound 2SC at each corresponding risk category on both cultivars did not greatly differ. The high and medium risk programs the superior disease control obtained with Bravo Weather Stik 6F was reflected often seen in significantly higher yields when compared with both rates of Abound 2SC. At the predicted low and medium risk programs on Georgia 06G and AT3085RO, Bravo Weather Stik 6F and both rates of Abound 2SC failed to provide the expected level of late leaf spot and rust control needed to avoid sizable yield loss. In the study at WGREC, similar levels of leaf spot control on Georgia-06G were obtained with the low, medium, and high risk Tilt Bravo/12.3 fluid ounce Abound 2SC programs (Table 2). The high and medium risk programs with the Tilt Bravo/18.2 fluid ounce Abound 2SC programs gave better leaf spot control than the corresponding low risk program. With Bravo Weather Stik, the best leaf spot control was obtained with the high risk compared with the medium and low risk programs. Higher leaf spot ratings but not differences in yield were noted in the high risk 18.2 fluid ounce Abound 2SC programs where Tilt Bravo SE was substituted for Bravo Weather Stik 6F. With Bravo Weather Stik 6F and Tilt Bravo/12.3 fluid ounce Abound 2SC programs, yields were similar regardless of total application number. As was noted on AT3085RO, the medium and high risk Tilt Bravo/18.2 fluid ounce Abound 2SC programs on Georgia 06G had higher yields than the corresponding low risk program. At each risk level, yield response with the low and high rates of Abound 2SC was similar. Thimet 20G and Temik 15G were evaluated at two sites on multiple peanut cultivars for suppression of the thrips vector, TSWV,

and impact on peanut yield. When compared with the non-treated control, significant reductions in TSWV incidence were obtained at the WGREC site on five and seven of nine peanut cultivars with the soil insecticides Temik 15G and Thimet 20G, respectively. Of the nine cultivars, neither soil insecticide reduced disease incidence in Florida 07 or Georgia 06G. While Thimet 20G did reduce white mold incidence compared with Temik 15G, leaf spot ratings and yield for the soil insecticide-treated peanuts and the non-treated control were similar. Despite low TSWV pressure at the GCREC site, the soil insecticides Thimet 20G and Temik 15G reduced the incidence of this disease and increased peanut yield when compared with the non-treated control. The higher yields obtained with Temik 15G when compared with Thimet 20G could not be attributed to control of any disease or the peanut root knot nematode. The significant reduction in rust severity that was also obtained with Thimet 20G was not reflected in higher pod yields. In addition, low leaf spot, rust, and white mold ratings for York and Georgia 02C translated into the highest pod yields. With the exception of the leaf spot and rust damaged cultivars McCloud and Georgia 07W, yields for AP-4, Florida 07, Georgia 06G, Georgia Greener, and Tifguard were similar to those reported for the current industry standard Georgia Green. In a cultivar evaluation at PBU site in Central Alabama, peanut cultivars greatly differed in their reaction of early leaf spot and to a much lesser extent white mold. Typically, cultivars that had the lower leaf spot ratings, particularly York, had the highest yields. Of the most recently released peanut cultivars, Florida 07 and Tifguard suffered the least early leaf spot damage and had among the highest yields. Georgia 06G and Georgia Greener performed as poorly as the current industry standard Georgia Green. In a study on the impact of seeding rate on disease and yield of selected peanut cultivars, Georgia 06G displayed the best combination of low disease damage with correspondingly highest yields. While Georgia Green and AT3085RO suffered serious TSWV and CBR damage, respectively, yields of both cultivars were similar to Florida 07 and York. While seeding rate did not have a definitive impact on TSWV incidence, leaf spot severity and CBR incidence was higher at the 4 and 3 seed per foot rates, respectively. Despite the above differences in disease levels, yields were similar at seeding rates of 2, 3, 4, and 6 seed per foot of row.

Results of individual fungicide and cultivar screening trials as well as reports summarizing other Plant Pathology related research projects can be viewed at <http://www.ag.auburn.edu/aaes/communications/entplp/entplp12a.pdf> and <http://www.ag.auburn.edu/aaes/communications/entplp/entplp12b.pdf>. In addition, abstracts summarizing research projects supported by this grant were presented at the 2009 annual meetings of the American Peanut Research and Education Society and the American Phytopathological Society. Summary reports for trials supported by this grant through FY 2009-2010 have been submitted to the on-line Plant Disease Management Reports <http://www.plantmanagementnetwork.org/pub/trial/PDMR/volume3/> and will be published in mid-spring 2010.

Prepared by Austin Hagan, Professor and Extension Plant Pathologist.

**Report to the
Southeastern Peanut Research Initiative
6th Quarter Report (Final), Sept 1, 2010
On Progress on Research Supported by the Grant**

“Integrated Management of Tomato Spotted Wilt, Leaf Spot, Rust, White Mold, and CBR in Peanut”

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Update:

- A. Field tests were conducted (planted in mid-May) in which the effects of cultivars Georgia Green, Georgia-06G, Tifguard, and breeding lines CRSP 983 and CRSP 993 and C724-19-25 on incidence of spotted wilt and leaf spot were investigated. In addition, the test examined the performance of each of these lines under varying levels of fungicide inputs (0, 3, 4, and 6 applications of fungicides that included chlorothalonil, tebuconazole). Leaf spot pressure was intense. Final leaf spot ratings indicate greater final levels of defoliation in Georgia-06G than in Georgia Green or Tifguard in nontreated plots. Earlier ratings showed lower leaf spot severity in Tifguard than in Georgia Green, but by end of the season, these two cultivars were similar. All cultivars and breeding lines responded to fungicide inputs for leaf spot control. Yields of Georgia-06G, C724-19-25, and Tifguard were greater than for Georgia Green across fungicide treatments. All responded to fungicide inputs, but there was little yield response to greater than 4 fungicide applications on Tifguard. Similar trials are in progress in 2010.
- B. A field test was conducted (Planted late-April) at the UGA-CPES Rigdon Farm to determine the effect of seeding rate (3,4,5,and 6 seed/ft of row) on tomato spotted wilt and yield in Georgia Green, Georgia-06G, Florida-07, and Tifguard. Objectives included determining whether seeding rates can be reduced in highly resitant lines, especially those (Florida 07, Georgia-06G, and Tifguard) that have larger seed than Georgia Green. There was a substatal decrease in final incidence of spotted wilt with increased seeding rate in Georgia Green, but the effect was less noticable effect on the other three varieties. Georgia-06G, Florida-07 and Tifguard all have lower incidence of spotted wilt than Georgia Green regardless of seeding rate. Similarly, yields of all three other varieties were greater than those for Georgia Green for all seeding rates. Grade samples have been processed. As in 2008, economic aspects of seed costs, yield, grade, and value/A as well as incidence of tomato spotted wilt are being compared for the seeding rate range for each cultivar. A manuscript is in progress reporting the results of the two years. Additional trials examining reduced seeding rates in new TSWV resistant genotypes are now in progress.

- C. A field experiment was conducted (planted late April) examining the response of a total of 16 cultivars and genotypes to Thimet insecticide for management of tomato spotted wilt. The test included new cultivars Florida 07, Tifguard, AT-3085, Georgia-06G, Georgia Greener, Georgia-07W, and Georgia-08V and Georgia Green as a standard. Several (most) of the cultivars and breeding lines in the test had lower final incidence of spotted wilt than Georgia Green in the untreated plots. Georgia Green showed a strong response to Thimet, based on final incidence ratings. Cultivars Georgia-08V, Florida-07, Tifguard, Georgia Greener, Georgia-06G, Georgia-07W, and Georgia-2C had final spotted wilt ratings much lower than those of Georgia Green across Thimet treatments, and most of these cultivars had no significant response to Thimet for incidence of spotted wilt. However, in spite of low incidence of spotted wilt in event nontreated plots, Georgia-07W had approximately a 400 lb yield response to Thimet. Yield response to Thimet in Georgia Green was over 1000 lbs/A, but few of the other released cultivars had a significant yield response to Thimet. A manuscript is in progress relating the results of similar tests from 2007-2009. A similar trial is already in progress in 2010.
- D. Field experiments were conducted (planted early May) to examine the effects of silicate and plant growth regulator materials on incidence of spotted wilt. Georgia Green cultivar was used for these evaluations. These materials were compared to a nontreated check and in-furrow applications of Thimet insecticide as a standard. There was a significant reduction in incidence of spotted wilt and increase in yield with the use of Thimet, but no other treatment was different from the nontreated control.
- E. Trials were conducted at Citra, FL to examine the Effects of reduced fungicide rate upon early leaf spot, late leaf spot, rust and TSWV. The preliminary data for disease severity indicates that reduced rates of Provost and reduced rates of Topguard showed reduced early leaf spot compared to the untreated check but did not show any significant differences between treatments. Both leaf spot rating using the Florida leaf Spot rating scale and percent defoliation followed the trends observed with fungicide control of early leaf spot. Late leaf spot occurred at such a low level that there were no significant differences between any of the reduced rate fungicide application and the untreated check. The highest rate of Topguard resulted in greatest severity of rust in this test. Yield data has not yet been collected but will be available in the final report. The data for white mold severity indicates that the lowest rate of Abound was not different from the highest rate. The standard fungicides evaluated for disease control were significantly better than the untreated check when evaluating severity of disease.
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Final Report for Southeastern Peanut Research Initiative Project - 2009
Integrated Management of Leaf Spots, Rust, White Mold and *Cylindrocladium* Black Rot in peanut
UF Project Number: 00080887

December 31, 2010

Robert J. McGovern and Charles R. Semer IV
University of Florida-IFAS, Plant Medicine Program and Plant Pathology Department

Early Leaf Spot (*Cercospora arachidicola*) was the predominant disease in the field tests this year. Several of the experimental materials significantly reduced Early Leaf Spot compared to the untreated check. The standard disease control plans of Bravo Weatherstik 1.5 Pt/A (AB) alternated with Abound 2.08 12, oz/A (CE) and Bravo Weatherstik 1.5 Pt/A (DF) or Headline 2.35 oz/A (A) alternated with Abound (2.08SC) 18.2 oz/A(CDE) and Bravo WeatherStik 1.5 pt/A(FG) provided effective disease control for Early Leaf Spot and increased yields. None of the reduced rate fungicide applications produced significant disease control compared to the untreated check.

Late Leaf Spot (*Cercosporidium personatum*) occurred at such a low level that there were no significant differences between any of the fungicide treatments and the untreated check.

Rust (*Puccinia arachidis*) appeared late in the season but caused significant disease in many of the test plots. The standard disease control plan of Bravo Weatherstik 1.5 Pt/A (AB) alternated with Abound 2.08 12 oz/A (CE) and Bravo Weatherstik 1.5 Pt/A (DF) provided the best control of Rust. None of the reduced rate fungicide applications produced significant disease control compared to the untreated check.

White Mold (*Sclerotium rolfsii*) severity data indicated that the standard disease control plans of Echo 720 1.5 pt/A (ABC) alternated with Provost 433 SC 8oz/A (DEF) or Headline 2.35oz/A (A) alternated with Abound 18.2 oz/A (CDE) and Bravo Weatherstik 1.5pt/A (FG) provided effective disease control and increased yields

Cylindrocladium Black Rot (*Cylindrocladium crotalariae*) was not observed in the experiment during this season.

Tomato Spotted Wilt (TSWV) was limited in distribution to a few infection sites at the end of buffer rows and a single portion (10 feet out of 20 feet of row) in one buffer row on the West side of the plot . Therefore neither treatment nor cultivar effects were observed in the experiment.

Preliminary Report for Southeastern Peanut Research Initiative 2009 Project

Integrated management of Tomato Spotted Wilt, Leaf Spot, Rust, White Mold and CBR in peanut

September 15, 2009

To: Those interested in peanut diseases

From: Charles R. Semer IV, Clinical Trials Coordinator, Plant Medicine Program

Effects of reduced fungicide rate upon early leaf spot, late leaf spot, rust and TSWV.

The preliminary data for disease severity indicates that reduced rates of Provost and reduced rates of Topguard showed reduced early leaf spot compared to the untreated check but did not show any significant differences between treatments. Both leaf spot rating using the Florida leaf Spot rating scale and percent defoliation followed the trends observed with fungicide control of early leaf spot.

Late leaf spot occurred at such a low level that there were no significant differences between any of the reduced rate fungicide application and the untreated check. The highest rate of Topguard resulted in greatest severity of rust in this test.

Yield data has not yet been collected but will be available in the final report.

The preliminary data for white mold severity indicates that the lowest rate of Abound was not different from the highest rate. The standard fungicides evaluated for disease control were significantly better than the untreated check when evaluating severity of disease.