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Final Report Summary
Southeastern Peanut Research Initiative
January 1, 2011-June 30, 2012
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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Field tests were conducted in which the effects of cultivars Georgia-06G, Georgia-07W, Tifguard, Georgia Greener, Georgia-09B, and the USDA germplasm C724-19-25 on incidence of spotted wilt and leaf spot were evaluated. Final leaf spot severity ratings were higher for Georgia-09B than for any other line, but yields were still excellent for that line. Little yield or value response was observed for any entry with 7 applications based on yield and grades.

A field test was conducted to determine the effect of in-furrow Thimet applications on tomato spotted wilt severity and yield in several new peanut cultivars. There was a small decrease in average incidence of spotted wilt with Thimet in most cultivars. Yield response was variable across cultivars, and ranged from ~400 lb increase in yield with Thimet on Georgia-06G, to neutral or negative effects on some genotypes. A trial was conducted to determine the effect of seeding rate on the new cultivar Georgia-10T. Previous results indicate that Georgia-10T would go in the lowest risk (5 points) category in the spotted wilt index. The only other released cultivar in that class is Georganic. Results indicate that Georgia 10T should be in the lowest current risk category and that it has potential for use with reduced seeding rates.

Field trials were conducted in multiple locations to examine the relationship between defoliation caused by leaf spot diseases and yield in Georgia-06G, Tifguard, Florida-07, and Georgia-07W. In each trial, cultivars were combined with varying numbers of fungicide applications to allow development of different levels of leaf spot. At Attapulgus and Tifton, yields decreased with increasing leaf spot severity for Florida-07, Georgia-06G and Georgia-07W, but reduction in yield was much less than what would have been expected for cultivars such as Georgia Green. Little reduction in yield was observed with Tifguard in any trial. Although grades were affected by cultivar, there was no relation detected between leaf spot severity and grade within cultivars.

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Report to the
Southeastern Peanut Research Initiative
Final Report, Sept 27, 2012
On Progress on Research Supported by the Grant

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Update:

A. Field tests were conducted in which the effects of cultivars Georgia-06G, Georgia-07W, Tifguard, Georgia Greener, Georgia-09B, and the USDA breeding line C724-19-25 on incidence of spotted wilt and leaf spot were evaluated. All of these genotypes have shown excellent resistance to TSWV in previous trials, and Tifguard and C724-19-25 has some resistance to leaf spot fungi. However, other new cultivars appear to have some leaf spot tolerance as well, with good yields in spite of significant defoliation from leaf spot. In addition, one trial test will examined the performance of multiple lines under varying levels of fungicide inputs (0, 4, and 7 applications of fungicides that included chlorothalonil, and tebuconazole). Final leaf spot severity ratings were higher for Georgia-09B than for any other line, but yields were still excellent for that line. Little yield response was observed for any entry with 7 applications compared to 4 and there was little if any economic reponse based on yield and grade for the 7 vv 4 applications of fungicides considering the cost of fungicides and applications is being examined.

B. A field test was conducted at the UGA-CPES Rigdon Farm to determine the effect of in-furrow Thimet applications on tomato spotted wilt severity and yield in peanut cultivars Georgia-06G, Georgia-07W, Georgia-09B, Georgia-10T, Florida-07, Florun-107, and Tifguard. Objectives include comparing effects of the various genotypes on tomato spotted wilt, whether Thimet is needed for spotted wilt management, and if there are yield benefits to Thimet applications. Tomato spotted wilt pressure was light, but disease increased in the final portion of the season, with highest final incidence of 18.6% in nontreated plots of Florun 107. There was a small decrease in average incidence of spotted wilt with use of Thimet insecticide in most cultivars. Yield response to Thime was variable across cultivars, and ranged from ~400 lb increase in yield with Thimet on Georgia-06G, to neutral or negative effects on some genotypes. Final incidence of spotted wilt ranked lowest in the new cultivar Georgia-10T, and results corroborate previous results which indicate this variety should be in the lowest (5 point) risk category in the TSWV index, along with "Georganic".

C. One trial was conducted at the UGA-CPES Rigdon farm to determine the effect of seeding rate on the new cultivar Georgia-10T. Previous work indicates that resistance in Georgia-10T is sufficient to allow planting with seeding rates as low as 3 seed/ft of row. Georgia-10T, Tifguard, Georgia-06G, and highly resistant standards Georganic, and NC 94022 were planted at 3 and 6 seed/ft of row. Previous results indicate that Georgia-10T would go in the lowest risk (5 points) category in the spotted wilt index. The only other released cultivar in that class is Georganic. Spotted wilt pressure was light, with final incidence averaging ~9% in Georgia-06G. Final incidence in Georgia-10T was 1.1 and 0.4% for the 3 and 6 seed/ft of row treatments, respectively. Yields were similar for Georgia-10T, Tifguard, and Georgia-06G. Results from this trial also indicate that Georgia 10T should be in the lowest current risk category and that it has potential for use with reduced seeding rates without increased losses to tomato spotted wilt.

D. Three field trials were conducted to determine whether any of several non carbamate or ogranophosphorus insecticides can provide adequate control of tobacco thrips, without increasing the risk of losses to TSWV on Georgia-06G. Thrips pressure was light, but thrips feeding injury was suppressed by several insecticides. Terminal samples for thrips counts have been made and counting is in progress. Tomato spotted wilt pressure was light, but there was no indication that use of any of these insecticides increased incidence of TSWV as was observed on more susceptible genotypes with imidicloprid in previous years.

E. Field trials were conducted in Tifton, Plains, and Attapulgus, GA to examine the relationship between defoliation caused by leaf spot diseases and yield in Georgia-06G, Tifguard, Florida-07, and Georgia-07W. In each trial, cultivars will be combined with 0, 3, 4, and 7 applications of chlorothalonil to establish different levels of leaf spot, and all will be cover sprayed with flutolanil, to control white mold without affecting leaf spot. At Attapulgus and Tifton, wide ranges of final leaf spot severity were observed. Leaf spot severity was much lower at Plains. At Attapulgus and Tifton, yields decreased with increasing leaf spot severity for Florida-07, Georgia-06G and Georgia-07W, but reduction in yield was much less than what would have been expected for cultivars such as Georgia Green. Little reduction in yield was observed with Tifguard in any trial. Grade samples will also be processed from each plot in effort to determine the value for each plot and determine potential economic impact of leaf spot in the various cultivars. Across trials in 2010 and 2011, it appears that these new cultivars are more forgiving with regard to maintaining yield in the presence of leaf spot than previous cultivars, if white mold is controlled. Grade samples have been processed from each of the trials, and a preliminary yield response model for fungicides has been developed. Based on these findings, if white mold is not a factor, optimum number of fungicide applications in new cultivars Tifguard, Florida-07 and Georgia-06G may be less than 7 if yield value and cost of fungicides and application are considered.

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NATIONAL PEANUT BOARD / SOUTHEAST PEANUT RESEARCH INITIATIVE

FINAL REPORT for 2011 work done under project agreement entitled:
"Integrated Management of Tomato Spotted Wilt, Leaf Spot, Rust, White Mold, and CBR in Peanut".

NPB Project # 22
GPC Budget # 4-951
UGA Sub-Account #25-21-RF332-594

INSTITUTION:	University of Georgia (UGA)
Co-Principle Investigator:	Dr. R. Scott Tubbs
EXPIRATION DATE:	30 June 2012
SPRI CONTACT:	Emory Murphy
NPB CONTACT:	Marie Fenn

FINAL REPORT:

Seeding Rate x Seed Treatment – a two factor factorial experiment in a randomized complete block design with 5 replications was conducted in 2011 using 'Tifguard' peanut either untreated or treated with Dynasty fugnicide (azoxystrobin + fludioxonil + mefenoxam) at 4 oz per 100 lb of seed, then planted at two seeding rates (3.8 seed per foot of row vs. 5.7 seed per foot of row). Plots were planted on May 10, 2011. Standard crop management based on UGA Extension recommendations were followed for routine maintenance.

An evaluation of the actual seeding rate placed in the ground by the planter was conducted to determine if the planter was calibrated correctly and truly delivering the listed seeding rate. This was done by digging seed from the ground immediately after planting in 2 foot increments in 4 locations in each plot and counting the seed. Error was less than 6% in 15 out of 20 plots (75%), and the average true seeding rate was very close to the target seeding rate (3.8 seed/ft rate delivered 3.8 seed/ft on average; 5.7 seed/ft rate delivered 5.5 seed/ft on average).

Data collected included emergence stand counts (24 days after planting) and harvest stand counts, plant heights at approximately maximum vegetative growth (105 days after planting), incidence of Tomato spotted wilt virus, yield, and grade. These values were analyzed for differences using ANOVA through PROC GLIMMIX in SAS, and results are presented in Table 1.

Table 1. Yield, grade, canopy height, emergence and harvest plant stands, and Tomato spotted wilt virus (TSWV) incidence for two seeding rates and two seed treatments, Plains, GA, 2011.

Seeding Rate	Pod Yield (Lb/Ac)	Grade (% TSMK)	Height (Inches)	Emerged Stand (plants/ft)	Harvest Stand (plants/ft)	TSWV (%)
3.8 seed/ft	4814 a	73.6 a	16.1 b	2.4 b	2.2 b	7.5 a
5.7 seed/ft	4846 a	74.3 a	17.0 a	2.8 a	3.1 a	8.8 a
Seed Treat.						
Dynasty	5010 A	74.2 A	17.7 A	2.9 A	3.2 A	7.3 A
Untreated	4650 B	73.6 A	15.4 B	2.3 B	2.1 B	9.0 A

Seeding rate did have an effect on plant stand, and this likewise caused a difference in plant height, as the plant tends to grow more upright when bunched closer together. However, there were no resulting differences in yield, grade, or TSWV incidence despite the variation in plant stand when averaged over seed treatment. As for the seed treatment, the inclusion of Dynasty likewise caused better plant stands and taller plants similar to the higher seeding rate. However, a yield improvement was observed with the seed treatment compared to untreated seed. This is an indication that the treated seed was better protected from disease and environmental conditions that likely caused greater plant mortality. There was an interaction of seeding rate x seed treatment for final stand (not shown), in which the treated seed at the high seeding rate was close to the target plant population (3.8 plants/ft of row), whereas the untreated seed at the low seeding rate was less than half of that (1.8 plants/ft of row).

These results demonstrate the effectiveness of a fungicidal seed treatment and the impact of seeding rate on plant stand. The relatively low cost of a fungicidal seed treatment coupled with results like these continue to make that a "no-brainer" input for all peanut production that do not have restrictions against use of such products. In the case of organic production, these results were still favorable for producing a decent plant stand without use of a seed treatment, although a higher seeding rate would be recommended to improve plant stands even further without the protection against seedling diseases.