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Southeastern Peanut Research Initiative 2016
FINAL REPORT + Summary

UF Project Number: 00126660

Project Title: Integrated Management of Tomato Spotted Wilt, Leaf Spot Disease, Rust, White Mold and CBR in Peanuts

Reporting Period: 1/01/16-6/30/17

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1. Abstract

Fungal diseases as well as viral (Tomato Spotted Wilt) are significant profit-limiting components for peanut production in Florida and the southeastern U.S. Current management strategies can be effective for most diseases, but continued information about strategy efficacy and utility is needed for optimal peanut production. The integration of cultural and chemical disease management strategies is critical for determining optimal pathogen management system for producers. Disease resistant cultivars and fungicide spray frequencies have been found to affect losses from early leaf spot, late leaf spot and stem rot/white mold (*Sclerotium rolfsii*). Results from this study indicate the importance of cultivar selection in determining chemical management strategies. The data from this research will be combined with previous years to examine the effects cultivar and fungicide timing have on disease development and yield and used to evaluate Peanut Rx indices.

2. Introduction

The objectives of this study were to determine the effects that cultivar and fungicide frequency have on the development of the diseases tomato spotted wilt, early leaf spot, late leaf spot and white mold/stem rot. This is a continuing study examining these effects for producers in Florida.

3. Methods

Peanut experimental plots were planted at the University of Florida's Plant Science Research and Education Unit in Citra, FL on 11 May 2016 in a Myakka fine sand soil that had been planted with a winter cover crop of Bahiagrass (*Paspalum notatum*). The varieties were planted at a density of six seeds per foot of row on 36-in. row centers. Plots consisted of paired 25-ft long treatment rows with untreated buffer rows between each treatment arranged in a split-plot design with 4 replications. Fungicide applications were made throughout the season with a CO_2 backpack sprayer calibrated to deliver 25 gal/A at 30 psi with TeeJetXR 8004VF nozzles at 36-in. spacing.

Foliar disease was recorded on a bi-weekly basis using the Florida 1 to 10 scale and white mold incidence was recorded as hits and % necrosis after the peanuts were dug. Yields were obtained by weighing harvested peanuts from the two treatment rows on a scale. All data was analyzed using the statistical program R with the ANOVA function.

The varieties tested in this study were Georgia-06G, FloRun 331 (UF1532), TUFRunner511, FloRun157 and TUFRunner297. Each peanut variety was treated with a fungicide application program consisting of 0, 4, 5 or 7 sprays listed in the table below.

	Days After Planting								
	29	42	47	61	77	92	105	112	120
4 Sprays		Echo 720 @ 1.5 pt/a		TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a		Abound 2.08SC @ 18 fl oz/a + Echo 720 1 pt/a		TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a	
5 Sprays		Echo 720 @ 1.5 pt/a		TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a	Echo 720 @ 1.5 pt/a	Abound 2.08SC @ 18 fl oz/a + Echo 720 1 pt/a		TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a	
7 Sprays	Echo 720 @ 1.5 pt/a		Echo 720 @ 1.5 pt/a	TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a	TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a	Abound 2.08SC @ 18 fl oz/a + Echo 720 1 pt/a	TebuStar @ 7.2 fl oz/a + Echo 720 1 pt/a		Echo 720 @ 1.5 pt/a

4. Results

Analysis of variance indicated that the number of fungicides sprays applied and variety significantly affected ($p<0.01$) the yield and disease, but no interaction was present ($p > 0.10$) between variety and fungicide spray number. Soil borne disease pressure was low in the plots with less than 1 hit per plot (50 ft of row) of white mold noticed in this study. Foliar disease pressure was moderate with Florida 1 to 10 ratings varying between 5 and 7 in the untreated plots 125 days after planting (Figures 3 and 4). In general, all the varieties performed better as fungicide application numbers increased from 4 to 7(Figure 2). No significant yield differences ($p > 0.10$) were observed between the 5 and 7 application programs, with numeric decreases between these application programs noticed for varieties Georgia 06G and TUFRunner297. However the cultivars TUFRunner511, FloRun157 and FloRun331 (UF15302) did see numeric increases in yield between 5 and 7 sprays. FloRun331 was consistently the highest yielding variety for all treatments followed by TUFRunner511 with Georgia 06G, FloRun157 and TUFRunner297 producing similar yields across the spray treatments (Figure 1).

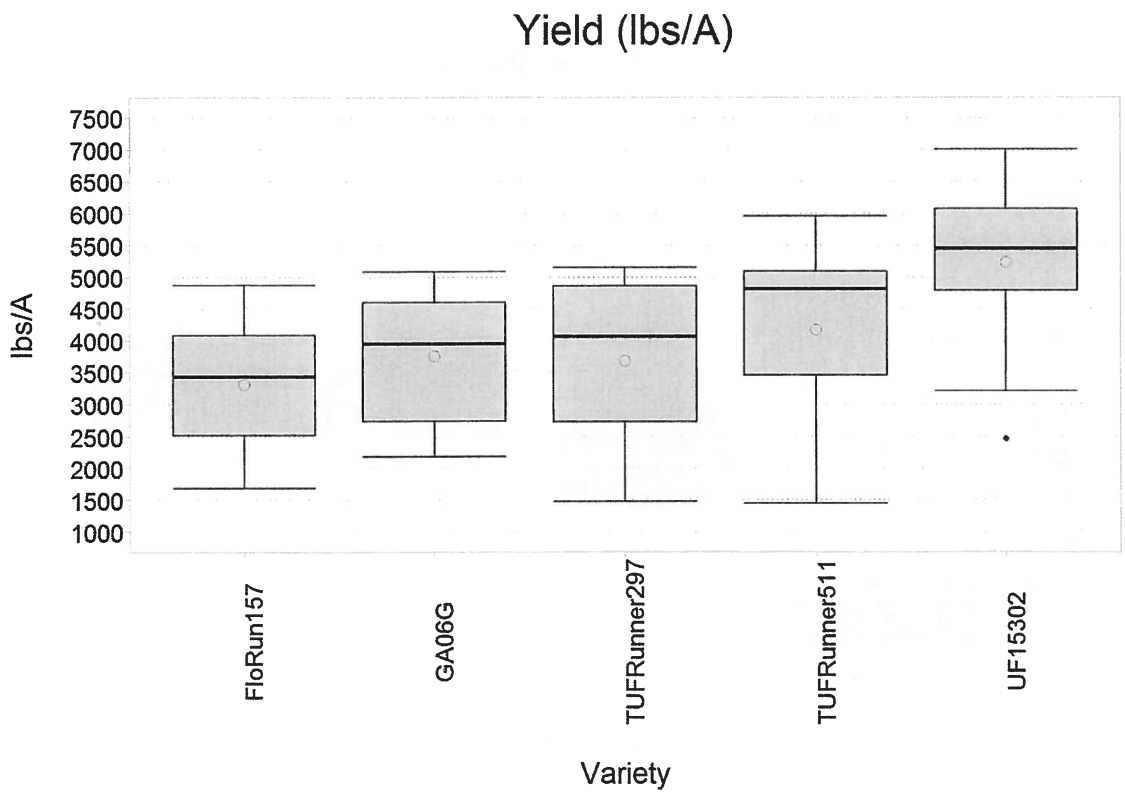

Figure 1: Yield data (pounds per acre) from plots harvested on 9/30/16, 147 days after planting. Data was based on 4 replications of 2 row plots that were 25 feet long. The boxplots show the distribution of the yields with the solid black line indicating the median and the open circle the mean. The varieties tested in this trial were Georgia-06G (GA-06G), FloRun 331 (UF15302), TUFRunner511, FloRun157 and TUFRunner297.

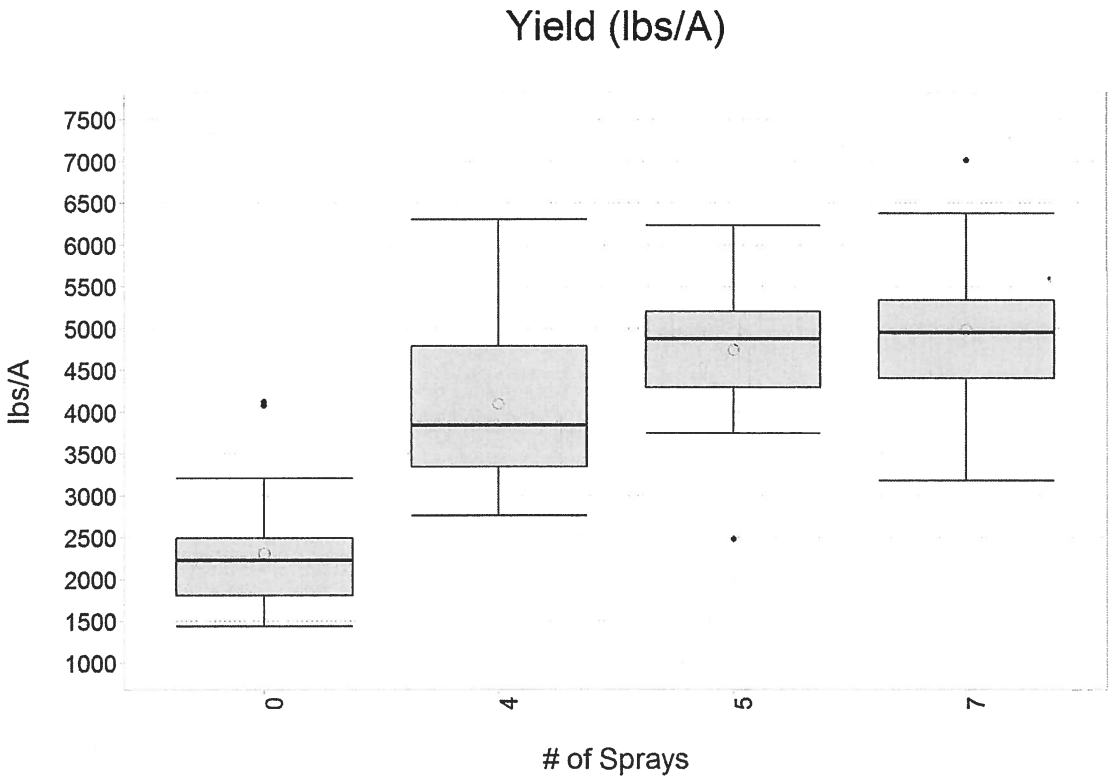

Figure 2: Yield data (pounds per acre) from plots harvested on 9/30/16, 147 days after planting. Data was based on 4 replications of 2 row plots that were 25 feet long. The boxplots show the distribution of the yields with the solid black line indicating the median and the open circle the mean. The spray applications tested in this trial were no sprays (0), 4, 5 and 7 all containing the fungicides chlorothalonil, tebuconazole and azoxystrobin.

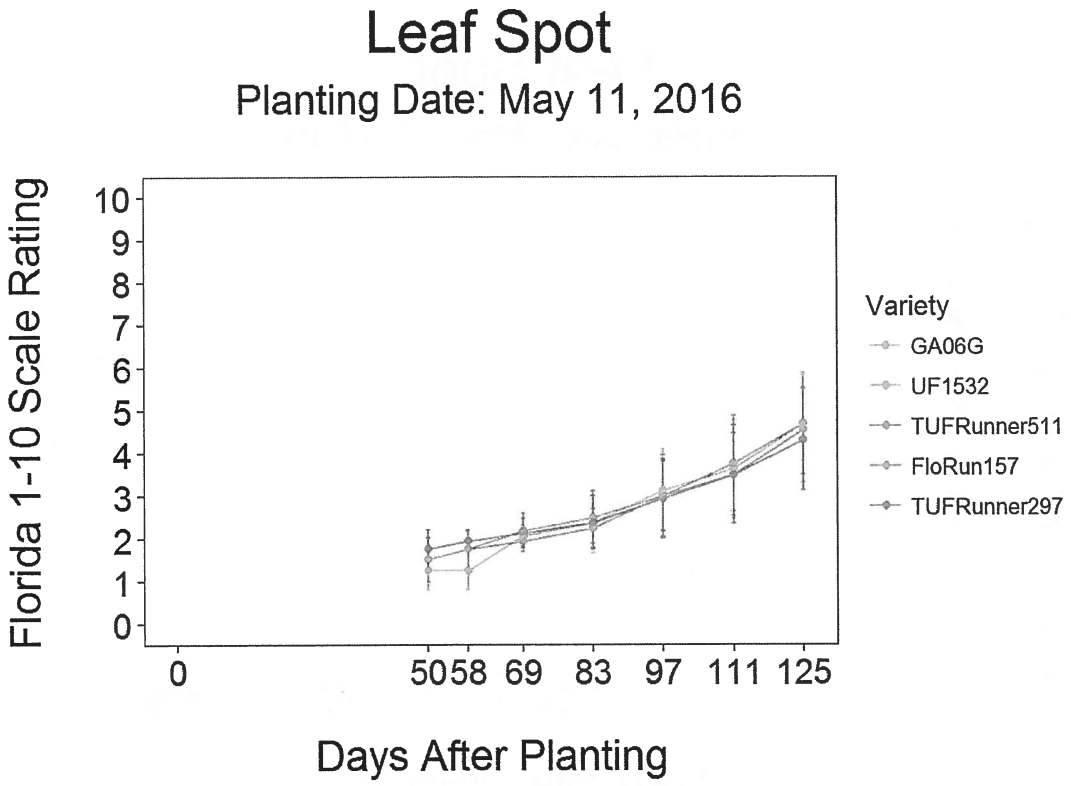

Figure 3: A line graph of the Florida 1 to 10 scale ratings recorded throughout the season for the different varieties. Data was collected from the 2 treatment rows. The bars represent mean variance. The varieties tested in this trial were Georgia-06G (GA-06G), FloRun 331 (UF15302), TUFRunner511, FloRun157 and TUFRunner297.

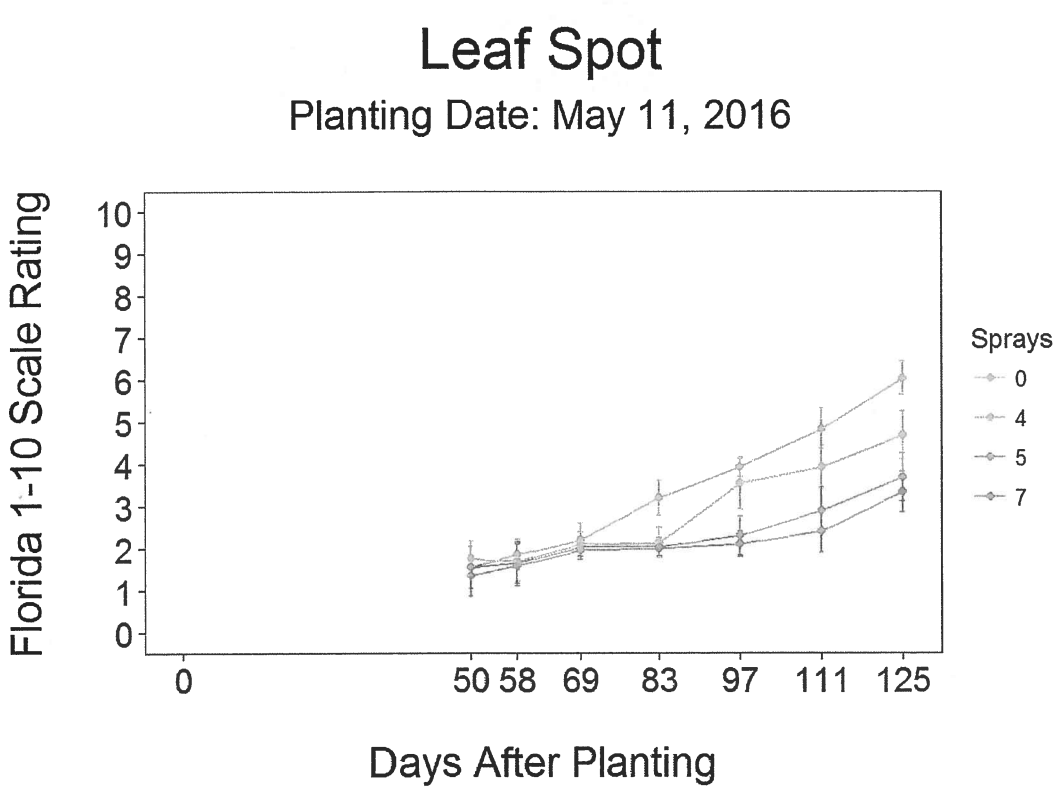

Figure 4: A line graph of the Florida 1 to 10 scale ratings recorded throughout the season for the different spray application programs. Data was collected from the 2 treatment rows. The bars represent mean variance. The spray applications tested in this trial were no sprays (0), 4, 5 and 7 all containing the fungicides chlorothalonil, tebuconazole and azoxystrobin.

5. Summary

Overall, these results indicate that on average 5 applications of fungicide provided adequate disease control for all varieties tested in 2016, with FloRun331 performing best in a low soil borne and moderate foliar disease scenario. This is consistent with previous studies, which indicated that in moderate to low disease pressure years, yields for all varieties were similar in the 5 and 7 spray program. However, previous research has indicated that 7 spray applications can significantly save yields when disease pressure is high (FL 1 to 10 scale ratings of 8 to 10 ratings). Also, it is seen that in these high pressure disease scenarios that varietal selection is critical to obtaining quality yields. These results supports the concept of planting multiple cultivars to handle the variation associated with each growing season.