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Southeastern Peanut Research Initiative 2017
FINAL REPORT

UF Project #: P0047359

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

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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 16 May 2017 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, 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 high with Florida 1 to 10 ratings varying between 7 and 9 in the untreated plots 125 days after planting (Figures 2). In general, all the varieties performed better as fungicide application numbers increased from 4 to 7(Figure 1). A significant yield difference ($p < 0.01$) were observed between the 5 and 7 application programs for Georgia 06G only. Even though they had not significant differences, the varieties TUFRunner511, FloRun157 and FloRun331 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, and TUFRunner297 producing similar yields (Figure 1).

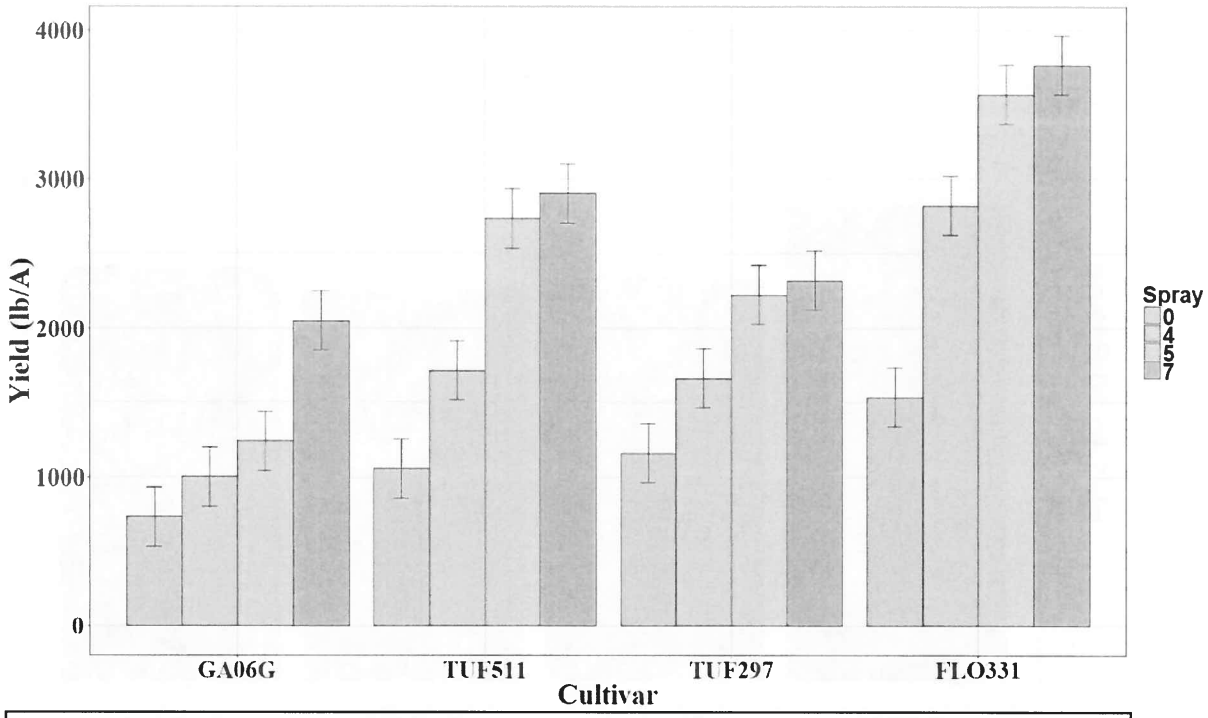

Figure 1: Yield data (pounds per acre) from plots harvested on 10/3/17, 140 days after planting. Data was based on 4 replications of 2 row plots that were 25 feet long. The bar graph shows the mean yields with the error bars showing the standard error from the ANOVA (LSD = 559). The varieties tested in this trial were Georgia-06G (GA06G), FloRun 331 (FLO331), TUFRunner511 (TUF511) and TUFRunner297 (TUF297) with the colors of the bars representing the spray programs in Table 1.

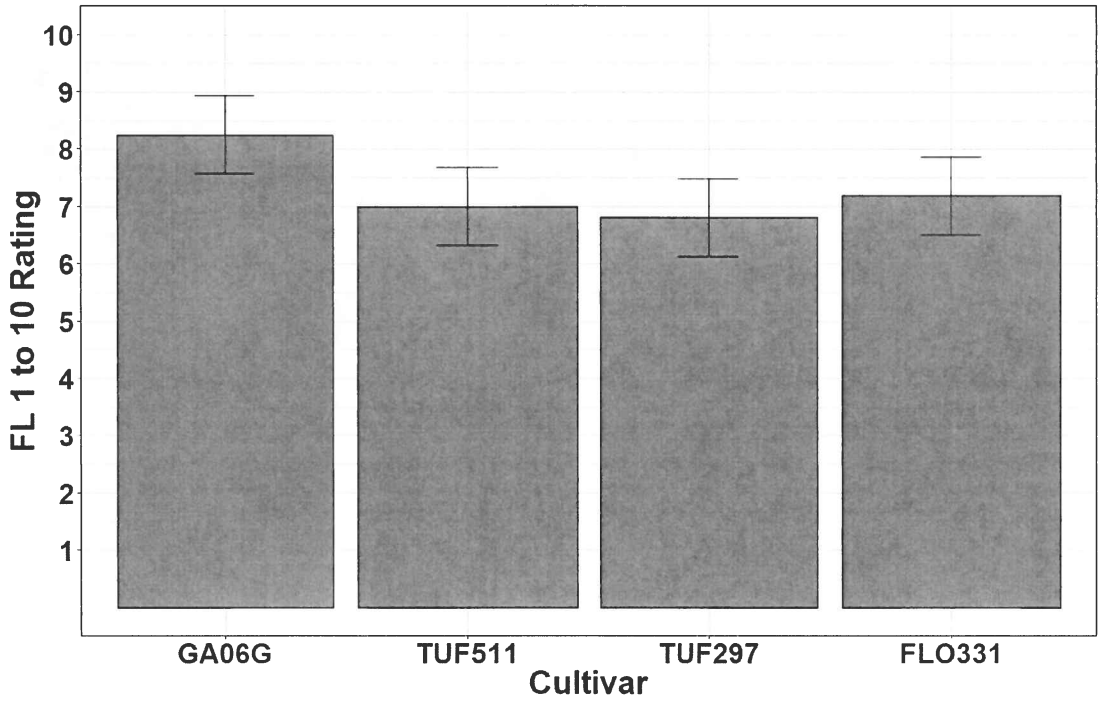

Figure 2: A bar graph of the Florida 1 to 10 scale ratings recorded 134 days after planting for the different varieties. Data was collected from the 2 treatment rows. The error bars represent standard error from the ANOVA. varieties tested in this trial were Georgia-06G (GA06G), FloRun 331 (FLO331), TUFRunner511 (TUF511) and TUFRunner297 (TUF297).

Summary

Overall, these results indicate that on average 5 applications of fungicide provided adequate disease control for all the Florida varieties tested in 2017, with FloRun331 performing best in a low soil borne and high foliar disease scenario. This is consistent with previous studies, which indicated that yields for the various 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), but that was not the case with the FL varieties. It is possible the predominate leaf spot pathogen (early leaf spot in this case) can account for these differences. These results continue to support the concept of planting multiple cultivars to handle the variation associated with each growing season.