225
1299
2014

Southeastern Peanut Research Initiative 2014
FINAL REPORT

UF Project Number: 00115754

Project Title: Integrated Management of Tomato Spotted Wilt, Fungal Diseases, and Insect Pests of Peanut

Reporting Period: 1/1/14-6/30/15

Prepared by:
Nicholas S. Dufault, Extension Plant Pathologist, University of Florida
352-273-4623
nsdufault@ufl.edu

1. Abstract

Foliar and soilborne fungal disease are significant profit-limiting constraints for peanut production in Florida and the southeastern U.S. Current management strategies are effective for most diseases, but improved strategies and continued disease monitoring are needed for optimal peanut production. The integration of cultural and chemical disease management strategies is critical for determining optimal management system for producers. Disease resistant cultivars and fungicide spray frequencies have been found to affect losses from early leaf spot (*Cercospora arachidicola*), late leaf spot (*Cercosporidium personatum*) and stem rot/white mold (*Sclerotium rolfsii*). Results from this study indicate the importance of cultivar selection in determining chemical management strategies. The data also indicates that in certain situations increased spray numbers do not consistently lead to increased profits.

2. Objectives

The objectives of this study were to determine the effects that cultivar and fungicide frequency have on the development of the diseases early leaf spot, late leaf spot and white mold/stem rot. It is hypothesized that varieties with more tolerance to leaf spot diseases and white mold will require lower fungicide inputs to attain optimal yields.

3. Methods

Peanut experimental plots were planted at the University of Florida's Plant Science Research and Education Unit in Citra, FL on 30 April 2014 and the 5 June 2014 in a Myakka fine sand soil that had been planted with a winter cover crop of Bahiagrass (*Paspalum notatum*). The varieties tested in both planting were Georgia-06G, Florida-07, FloRun107, TUFRunner 511 and TUFRunner 727. 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 (0.77 A). Fungicide applications were made throughout the season 30, 40, 48, 62, 76, 91, 105, and 112 days after planting (DAP), and reduced sprays were based on removal of the selected dates as described in table 1 below. Foliar treatments were applied with a CO_2 backpack sprayer calibrated to deliver 25 gal/A at 30 psi with TeeJetXR 8004VF nozzles at 36-in. spacing. Each peanut variety was treated with a fungicide program of 4, 5 or 7 following the schedule outlined in table 1. An untreated check (0 spray program) was also provided for each variety tested in the trial.

Table 1. Spray schedule for fungicide treatments consisting of 4, 5 and 7 sprays. Numbers in the top row indicate the day after planting (DAP) when the product below was applied.

Total Spray #	31	40	48	62	76	91	105	112	118
4		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		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	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

Leaf spot diseases were estimated on a biweekly schedule starting on July 7th using the Florida 1 to 10 scale. White mold/stem disease presence was estimated on a biweekly basis after July 7th by counting the number of 1 ft sections in a row that had the disease present, and at the end of the season through a severity rating of the pods and roots after digging. Yields were obtained by weighing harvested peanuts from the two treatment rows on a digital balance. All data was analyzed with ANOVA using SAS version 9.2 and differences were determined using the multiple comparison test Fisher's least significant difference (LSD; $P < 0.05$).

4. Results

Peanut Fungicide Rate by Variety Planting Date 1:

During the 2014 season, the maximum amount of white mold observed within in a single plot was 5 hits and for a maximum average of 2.5 hits per treatment. Due to these low numbers, disease pressure related to this disease was not analyzed in this study.

Analysis of variance indicated that there was a significant ($p < 0.05$) interaction between variety and fungicide spray number in relation to yield and final leaf spot intensity. Both Georgia-06G and FloRun 107 had average Florida 1 to 10 values of greater than 5 in their untreated plots. This value indicates that the untreated plants have lesions in the upper canopy with noticeable but non-quantifiable defoliation (Figure 1). Yield data in the untreated Georgia-06G plot averaged about 6400 lb/A (Figure 2), with increasing spray numbers increasing yields numerically, but no significant ($p < 0.05$) differences between the 5 and 7 sprays for all the varieties tested.

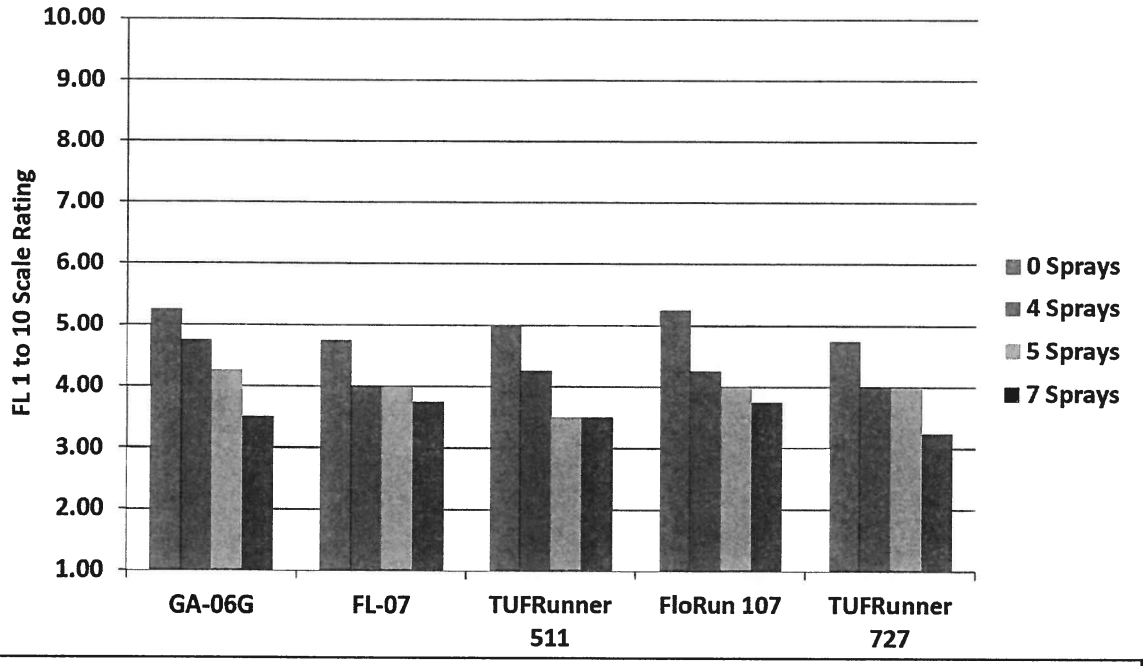

Figure 1: Leaf spot disease rating recorded using the Florida 1 to 10 scale for peanuts planted on April 30th 2014. The bars represent the 0, 4, 5 and 7 fungicide spray programs tested in this trial (Table 1). The varieties tested in this trial were Georgia-06G (GA-06G), Florida-07 (FL-07), TUFRunner 511, FloRun 107 and TUFRunner 727.

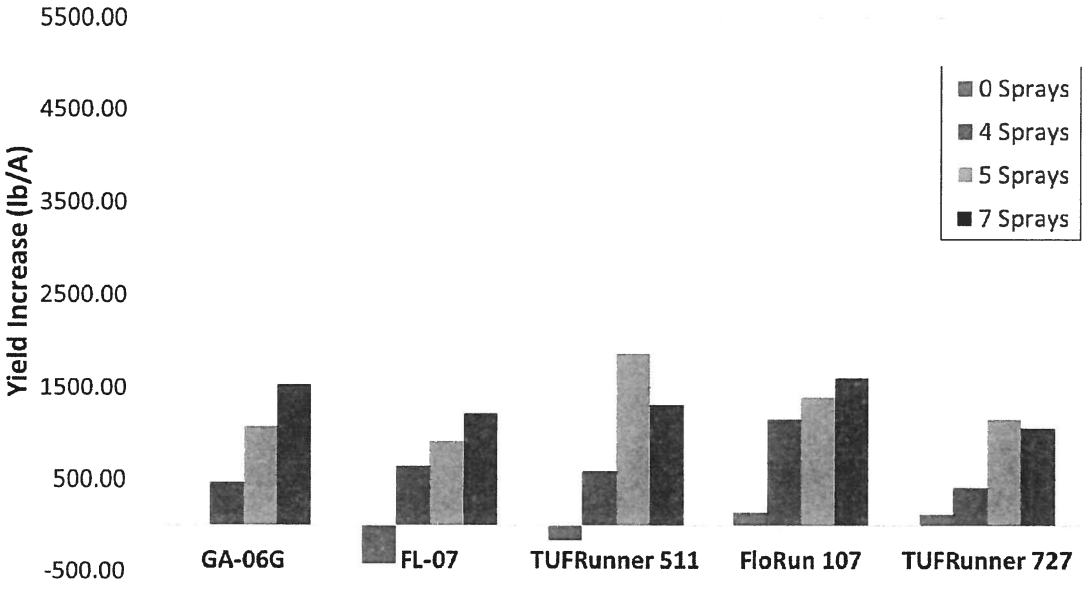

Figure 2: Estimated yield increases for the different treatments compared to the 0 spray Georgia-06G treatment which yielded roughly 6,400 lb/A for peanuts planted on April 30th 2014. The bars represent the 0, 4, 5 and 7 fungicide spray programs tested in this trial (Table 1). The varieties tested in this trial were Georgia-06G (GA-06G), Florida-07 (FL-07), TUFRunner 511, FloRun 107 and TUFRunner 727.

Peanut Fungicide Rate by Variety Planting Date 2:
During the 2014 season, the maximum amount of white mold observed within in a single plot was the slightly less than that reported for planting date 1. Due to these low numbers, disease pressure related to this disease was not analyzed in this study.

Analysis of variance indicated that there was a significant ($p < 0.05$) interaction between variety and fungicide spray number in relation to yield and final leaf spot intensity. Both Georgia-06G, FloRun107, and TUFRunner 511 had average Florida 1 to 10 values of greater than 7.5 in their untreated plots (Figure 1). This value indicates that the untreated plants have lesions in the upper canopy with defoliation greater than 75%. Yield data in the untreated Georgia-06G plot averaged about 800 lb/A (Figure 2), with increasing spray numbers increasing yields numerically. No significant ($p < 0.05$, LSD = 834) yield differences were observed between the 5 and 7 sprays for the variety Florida-07, but differences were observed for the rest of the treatments. The 0-spray program for TUFRunner 727 produce yields that were significantly greater or not different from 4 and 5 spray programs for Georgia-06G, FloRun107 and TUFRunner 511.

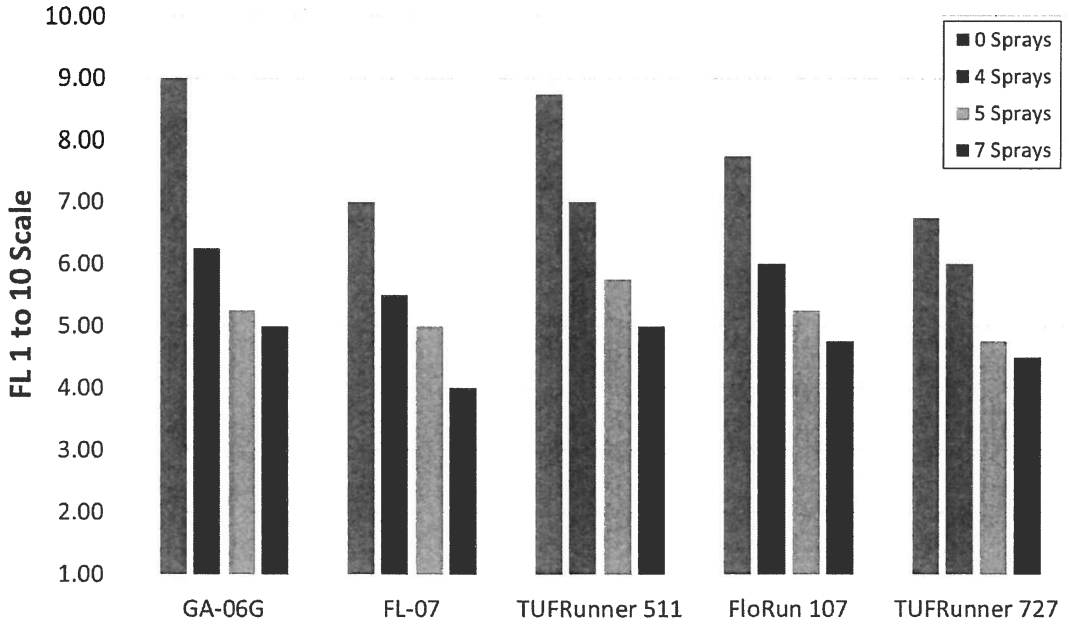

Figure 3: Leaf spot disease rating recorded using the Florida 1 to 10 scale for peanuts planted on June 5th 2014. The bars represent the 0, 4, 5 and 7 fungicide spray programs tested in this trial (Table 1). The varieties tested in this trial were Georgia-06G (GA-06G), Florida-07 (FL-07), TUFRunner 511, FloRun 107 and TUFRunner 727.

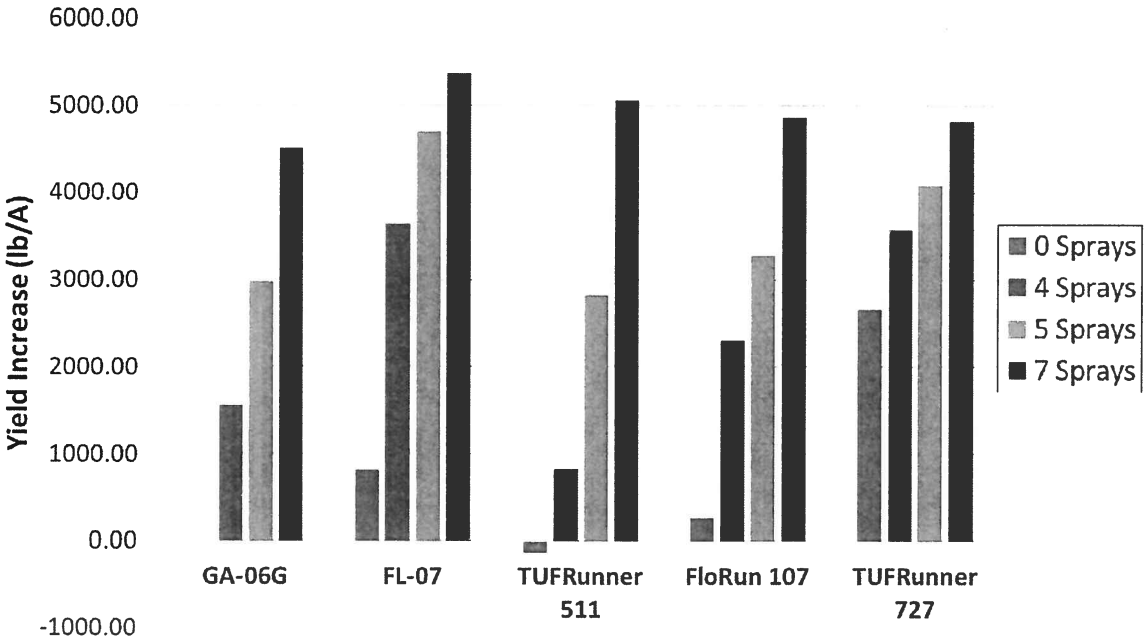

Figure 4: Estimated yield increases for the different treatments compared to the 0 spray Georgia-06G treatment which yielded roughly 800 lb/A for peanuts planted on June 5th 2014. The bars represent the 0, 4, 5 and 7 fungicide spray programs tested in this trial (Table 1). The varieties tested in this trial were Georgia-06G (GA-06G), Florida-07 (FL-07), TUFRunner 511, FloRun 107 and TUFRunner 727.

5. Summary

Overall, the results indicate the importance of varietal selection in determining foliar disease management programs. Both Florida-07 and TUFRunner 727 performed better than Georgia-06G in reduced spray programs with TUFRunner 727 still producing a high yield with 0 sprays. Thus, the mixing of these more tolerant varieties into planting programs should be considered, especially in areas that are prone to leaf spots. This type of mixing could all producers to prioritize their spray based on the susceptibility of the variety.

Many factors can affect disease intensity, and continued research to understand these affects is critical to obtaining optimal peanut yields. As new resistant and tolerant varieties are developed, researchers will need to determine disease inputs carefully and over multiple seasons. This study is part of a continuing study looking at the effects of variety and fungicide spray frequency on peanut disease management.