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NATIONAL PEANUT BOARD/SOUTHEAST PEANUT
RESEARCH INITIATIVE
FINAL PROGRESS REPORT FOR WORK
DONE UNDER RESEARCH AGREEMENT

Final
~~Quarter ending~~

March 31, 2007

INSTITUTION: University of Georgia

PROJECT TITLE: Tropical Spiderwort Biology and Management

RES. AGR. NO.: 26-31-RE671-365

PROJECT LEADER: Barry Brecke (FL
Eric Prostko (GA
PI)

GACCP Control NO.: 4-861-653-5

EXPIRATION DATE: June 30, 2007

NPB CONTACT: Dee Houston
NPB Control NO.: 197

REPORT OF PROGRESS:

The field project for 2006 was completed. A copy of the results were sent to Dr, Barry Brecke to include in the final report for the project. Additional studies are being conducted in 2007. A copy of the results is attached to this report.

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National Peanut Board
Southeastern Peanut Research Initiative
Project Annual Report
January 1 - December 31, 2006

Project Leader: Barry J. Brecke
Expiration Date: December 31, 2006

Title: Tropical Spiderwort Biology and Management
Investigators:

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Funding Period: January 1, 2006 to December 31, 2006

Objectives:

1. Determine the impact of tillage on tropical spiderwort infestation level.
2. Determine the effectiveness and economic return of selected herbicides for control of tropical spiderwort and compare effectiveness and economic return under conventional and strip-tillage regimes.
3. Determine the seed dynamics of tropical spiderwort.
 - a. Determine depth of emergence of tropical spiderwort seed in the greenhouse
 - b. Measure the distribution of tropical spiderwort seed in the soil profile in the field under both conventional and strip-tillage regimes

Progress Report

Studies were conducted in Florida and Georgia during 2006 to study the biology and

management of tropical spiderwort. At Jay, FL two studies were established in areas that were heavily infested in the past with tropical spiderwort to evaluate the impact of tillage on tropical spiderwort management. In the first study several herbicide programs were studied in both strip-tillage and conventional tillage. Due to the extremely dry conditions, there was a very low level of spiderwort infestation and most of the herbicide programs performed well. However, there were differences in tropical spiderwort control between conventional and strip-tillage (Table 1) with better control observed in the conventional tillage system.

Table 1. Herbicide Programs in Conventional vs Strip-Tillage for Control of Tropical Spiderwort.

Treatment	% Tropical Spiderwort Control	
	Conv. Tillage	Strip-Tillage
Prowl PRE + Dual + Gramoxone AC	95	85
Prowl + Valor PRE	80	70
Prowl PRE + Dual + Gramoxone AC + Dual + Cadre POST	100	85

In a separate, long-term study where plots have been under continuous strip-tillage or continuous conventional tillage for 4 years, tropical spiderwort control averaged 85% in the conventional tillage plots but only 25% in the strip-tillage area. Weed counts made late in the season indicated much higher tropical spiderwort density in the strip tillage compared to the conventional tillage (5 per yd² in conventional tillage vs 35 per yd² in strip-tillage) These results are similar to those observed in previous years in this study.

Soil cores were collected from various depths in both strip-tillage and conventional tillage plots and were then placed in the greenhouse to determine seed distribution within the soil profile. More seedlings emerged from samples collected from 0-4" in the strip-tillage plots than conventional tillage and more seedlings emerged from samples collected from deeper in the profile under conventional tillage. These results indicate that seed are found deeper in the soil under conventional tillage than where strip-tillage is used.

In Gainesville, a study was conducted comparing several herbicide treatments under either conventional tillage or strip-tillage into **bahiagrass sod**. No tropical spiderwort emerged in the killed bahiagrass plots while there were significant populations in the conventional tillage area. Apparently strip-tillage into a killed bahiagrass sod greatly reduces the potential for tropical spiderwort to infest an area. Even at the end of the season no tropical spiderwort plants were found in the killed bahiagrass sod.

A study was conducted in 2006 in Grady County, Georgia in grower's fields to evaluate the effect of tillage on the distribution of tropical spiderwort seed in the soil profile. The study was compromised due to inadvertent application of Strongarm to the study area. Prior to learning of this misapplication, both conventional and strip-tillage areas were sampled. Eighteen cores were collected from each tillage system in each of four replications. Cores were then sub-divided into three different depths: 0 to 4 inches, 4 to 8 inches, and 8 to 12 inches. Soil was placed in shallow flats and watered daily to encourage seed emergence. The idea was that seed distribution would be different between the tillage systems at the different soil depths. Flats were maintained in the greenhouse for six weeks without any tropical spiderwort emergence, probably due to the Strongarm applied prior to collecting the soil samples. Flats were allowed to dry for 10 days and then rewetted, but no subsequent tropical spiderwort emergence occurred.

Another study was conducted in Grady County, Georgia in 2006 in a grower's field to evaluate the depth of emergence of tropical spiderwort seedlings. Soil cores were collected using a golf-cup cutter and placed in pots to transfer back to Tifton for analysis. At each sampling date, 100 seedlings without any true leaves were used to evaluate the depth of emergence, based on the position of the seed relative to the soil surface. Samples were collected on 21 June 2006 and 11 August 2006. Due to dry weather, tropical spiderwort emergence was relatively low, compared to previous years where emerged populations summed 1,700 plants/m². Seedlings emerged from depths ranging from 0.1 to 6.5 cm (0.04 to 2.6 inches) and averaging 2.02 cm (0.80 inches) on 21 June. In August, the range of emergence depth was 0 to 6.0 cm (0 to 2.4 inches), with an average emergence depth of 1.65 cm (0.65 inches).

A 14 treatment herbicide test was established in Grady County, GA this summer. Unfortunately, due to dry conditions the tropical spiderwort population was low and no meaningful data could be collected.

Two 17-treatment studies were established in Grady County, GA after corn harvest to evaluate tropical spiderwort control post-harvest of corn. Selected treatments are listed in Table 2. Single applications provided no greater than 75% control of the tropical spiderwort while two sequential applications of 2,4-D or 2,4-D + Aim provided 90% control. The 2,4-D alone treatment is the least expensive of those tested and should provide economical control of spiderwort after corn harvest. By controlling tropical spiderwort late-season, additional seed production is prevented.

Table 2. Tropical Spiderwort Control Following Corn Harvest.

Treatment	% Tropical Spiderwort Control	
	One Application	Two Applications
Aim	50	71
Gramoxone	55	85
2,4-D	75	90
2,4-D + Aim	75	90