

Regional Thrips Trial 2009: Thrips Species Composition

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INTRODUCTION:

A regional cotton project was initiated in 2009, a portion of which was designed to evaluate thrips-preventive seed treatments and to examine the effect of the preventive treatments on thrips species composition. The species of thrips occurring on seedling cotton in the mid-South have been identified in previous studies (Cook et al. 2003, Reed et al. 2006). Numerous pesticide evaluation reports list efficacy but in general do not refer to species composition related to treatments unless a resistant species such as western flower thrips (*Frankliniella occidentalis* (Pergande)) is involved. A broad view of species composition on a regional basis as related to the use of Avicta and Aeris seed treatments was therefore a desired outcome of the project. Trials were established in 17 total locations within Arkansas, Georgia, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Texas, and Virginia.

MATERIALS AND METHODS:

Randomized complete block field studies evaluating Aeris seed treatment (Imidacloprid [insecticide] plus Thiodicarb [nematicide]), Avicta seed treatment (optional) (Thiamethoxam [insecticide] plus Abamectin [nematicide]), Temik (Aldicarb [insecticide and nematicide]) applied in-furrow, and an untreated check, were completed in 17 total locations. Avicta was used in 10 locations. Seed used in the Aeris, Temik and untreated plots were also treated with Trilex¹ and Allegiance² fungicides. Avicta treated seed was treated with the Dynasty CST³ fungicide package. Trials were located within Arkansas, Georgia, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Texas, and Virginia. Thrips were sampled on three sample dates by cutting five plants from each plot beginning at the first-second true leaf stage, placing them in containers, returning them to the lab, and washing the thrips from the plants onto a fine mesh screen (Burriss et al. 1989). Adult thrips were then counted and identified to species.

Data were summarized across sample dates and replicates within locations, and data were analyzed using locations as replicates with all variables fixed. The percentage of individual species relative to treatment was analyzed by using only locations where the species of interest was present based on the arcsin(sqrt(x)) transformation (Marascuilo and McSweeney 1977). The median test (Chi²) was the statistic used to evaluate differences of species percentages among treatments, with supporting analysis by the Kruskal-Wallis rank test to separate means.

RESULTS:

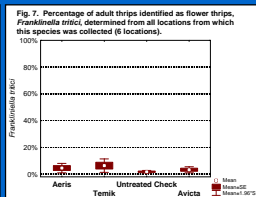
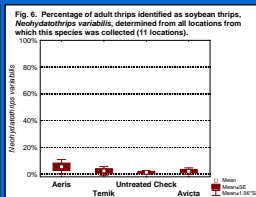
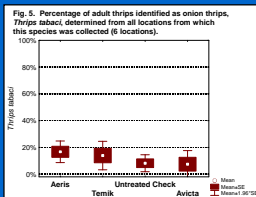
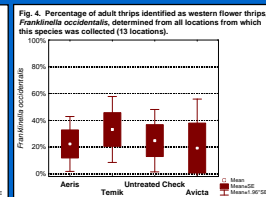
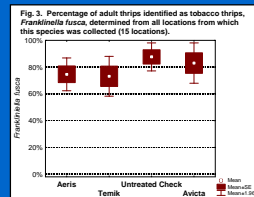
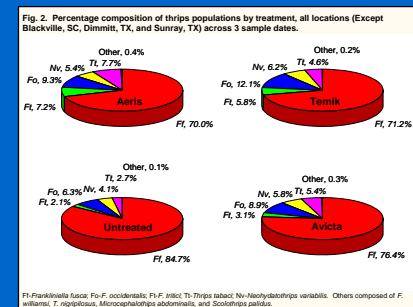
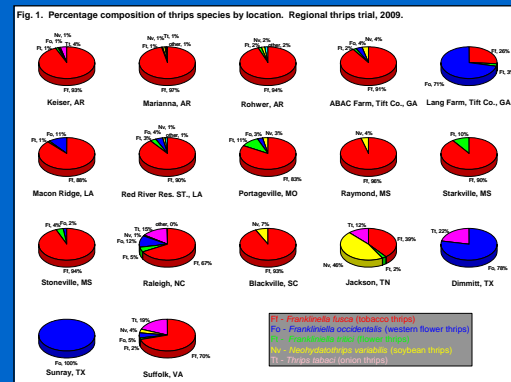
A total of 2,911 adult thrips were identified from the first three sample dates from each location with obvious treatment effects (not analyzed in this report) (Table 1). *Frankliniella fusca* (Hinds) (tobacco thrips) was identified at fifteen locations, *Thrips tabaci* Lindeman (onion thrips) at 6 locations, *F. occidentalis* (Pergande) (western flower thrips) and *Neohydatothrips variabilis* (Beach) (soybean thrips) at 11 locations, and *F. tritici* (Fitch) (flower thrips - sometimes referred to as eastern flower thrips) at 13 locations. Thrips from Sunray and Dimmitt, TX, and the Lang Farm, Tift Co., GA, were predominantly western flower thrips, and tobacco thrips were the most common species in other locations except Jackson, TN, where soybean thrips were most numerous.

Thrips species composition varied considerably among locations (Fig. 1). Overall distribution of thrips species relative to preventive insecticide treatments appears not to differ greatly among treatments, although the percentage of tobacco thrips was 8 -14% higher in untreated check plots than in the insecticide treated plots (Fig. 2), indicating that one or more species may be less susceptible to the systemic insecticides than tobacco thrips. When analyzed by species excluding locations where the species of interest was not found, Chi² analyses for tobacco thrips (Chi²=6.583, df=3, p=0.0864), flower thrips (Chi²=5.086, df=3, p=0.1656), western flower thrips (Chi²=3.084, df=3, p=0.379), soybean thrips (Chi²=3.778, df=3, p=0.286), and onion thrips (Chi²=1.623, df=3, p=0.654), were not significant, indicating that the percentage of thrips of each of these species did not differ between treatments (Chi²; p=0.05).

Figures 3-7 depict the percentage distribution of each common species among treatments based on analyses excluding locations where the species of interest was not found.

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Tobacco thrips



Western flower thrips



Onion thrips



Soybean thrips



Flower thrips

Treatment	Thrips
Aeris	836
Temik	634
Untreated Check	1116
Avicta	325
Total	2911

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