RESIDUAL EFFICACY OF AT-PLANTING SOIL APPLIED INSECTICIDES ON SEEDLING THRIPS POPULATIONS IN NORTHEAST LOUISIANA

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Abstract

Field trials were conducted to evaluate the efficacy of selected at-planting insecticides against seedling thrips on cotton and their subsequent effect on seedcotton yield. Trials were conducted on Commerce silt loam, Gigger silt loam and Sharkey clay soils in northeast Louisiana. Combined across soil types, the use of Temik 15G (0.5 lb AI/acre), Orthene 90S (0.9 lb AI/acre) and Orthene 80SP seed protectant (6.4 oz AI/cwt) resulted in significantly greater control of adult thrips than Gaucho 480S (4.0 oz AI/cwt) or Admire 2F (0.2 lb AI/acre). Also, the Temik 15G treatment resulted in significantly ($\underline{P}$>F <0.05) lower population densities of adult thrips than all other treatments. In trials conducted on a Commerce silt loam soil and on a Gigger silt loam soil at the Northeast Research Station, all insecticide treatments reduced immature thrips densities below the level in the untreated control. In the trial conducted on a Sharkey Clay soil, Orthene 90S, Orthene 80SP, Temik 15G and Admire 2F significantly reduced immature thrips populations compared to Gaucho 480S and the untreated control. Also, Temik 15G provided significantly greater control of immature thrips than Orthene 80SP. Combined across soil types, all insecticide treatments significantly increased seedcotton yields compared to the untreated control.

Introduction

Several species of thrips infest cotton fields in Louisiana (Newsom et al. 1953) and have the potential to achieve population densities capable of causing economic injury. Typical injury, due to thrips feeding, is characterized by whitish or silver areas on cotyledons. Also, blackened, malformed leaves or abortion of buds in the plant terminal can be observed. Often, a reduction in leaf area and plant height is associated with excessive feeding by thrips adults and immatures. When terminal bud abortion occurs, excessive branching is prevalent, causing a delay in crop maturity and in some instances, reductions in yield (Burris et al. 1989, Micinski et al. 1990).

Recently, cotton production has expanded to include marginal areas of clay soils in northeast Louisiana that were once considered unsuitable for cotton production. Temik 15G has long been recommended as an at-planting treatment for control of seedling thrips. However, there has been considerable interest expressed in alternative products for thrips control. Producers often prefer liquid in-furrow treatments for use on clay soils for compatibility with herbicide use strategies. Data reported herein expand the data base relative to the performance of Orthene 90S and Admire 2F on clay soils.

Materials and Methods

Trials were conducted at the St. Joseph location of the Northeast Research Station, near St. Joseph, LA and at the Winnsboro location of the Northeast Research Station, near Winnsboro, LA. Recommended cultural practices and integrated pest management strategies were utilized to maintain plots in a consistent manner within each trial.

Treatments were arranged in a randomized complete block design with four replications. Plots were four rows wide (40 inch spacing) x 45 ft. Stoneville 474 cotton seed of the same seed lot were planted on a Commerce silt loam soil at St. Joseph, a Sharkey clay soil at St. Joseph, and Gigger silt loam soil at Winnsboro.

In trials conducted at St. Joseph, cotton seed was planted with a John Deere 7100 series planter equipped with 10 inch seed cones mounted to replace the seed hoppers. The seeding rate was 4 seed/row ft. Granular in-furrow treatments were applied with 8 inch belt cone applicators mounted to replace the standard granular applicators. In-furrow spray treatments were applied with a CO_2 charged spray system through 25015 nozzles (1/row) mounted in front of the press wheels. The spray tips were turned to spray a 2-3 inch band across the furrow and calibrated to deliver 5 GPA finished spray.

In the trial conducted at Winnsboro, cotton seed was planted with a John Deere 7300 series planter equipped with 10 inch seed cones mounted to replace the seed hoppers. The seeding rate was 4 seed/row ft. Granular in-furrow treatments were applied with standard granular applicators. In-furrow spray treatments were applied with a CO_2 charged spray system through 80015 nozzles (1/row) mounted in front of the press wheels. The spray tips were turned to spray a 3-4 inch band across the furrow and calibrated to deliver 5 GPA finished spray.

Control of thrips was measured by randomly selecting 5 plants per plot at 7, 11, 15, 19, 23, and 27 days after emergence (DAE). Plant samples were processed by using whole plant washing procedures to remove insects (Burris et al. 1990).

Plots of the Commerce silt loam trial at St. Joseph were harvested on 23 Sep and on 8 Oct. The Sharkey clay trial at St. Joseph was harvested on 24 Sep and 8 Oct. The Gigger silt loam trial at Winnsboro was harvested on 26 Sep and 10

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Oct. Plots in all trials were harvested using a John Deere spindle-type picker.

Thrips population density data for individual sample dates were pooled to determine mean treatment effects across the entire sampling period. All data were subjected to analysis of variance (ANOVA) to determine significant treatment effects. Fisher's Protected LSD was used to compare treatment means (SAS Institute 1988). Data expressing significant treatment by soil type interactions is presented by soil type.

Results and Discussion

There was no significant treatment by soil type interaction observed for adult thrips. Combined across soil type, plots treated with Orthene 90S (0.9 lb AI/acre), applied as an in-furrow and Orthene 80SP seed protectant (6.4 oz AI/cwt), had significantly lower population densities of adult thrips than plots treated with Gaucho 480S (4.0 oz AI/cwt) or the untreated plots. Also, Temik 15G (0.5 lb AI/acre) resulted in significantly lower population densities of adult thrips than all other treatments (Figure 1).

A significant treatment by soil type interaction was observed for population densities of immature thrips. In the Commerce silt loam trial at St. Joseph and the Gigger silt loam trial at Winnsboro, all insecticide treatments resulted in significantly lower population densities of immature thrips than the untreated control (Figures 2 and 3). However there were no significant difference in the number of immature thrips among the five insecticide treatments.

In the Sharkey clay trial at St. Joseph, Orthene 90S (0.9 lb AI/acre), Orthene 80SP (6.4 oz AI/cwt) seed protectant, Admire 2F (0.2 lb AI/acre) and Temik 15G (0.5 lb AI/acre) resulted in population densities of immature thrips significantly lower than those of Gaucho 480S (4.0 oz AI/cwt) and the untreated control (Figure 4). Also, plots treated with Temik 15G (0.5 lb AI/acre) had numbers of immature thrips significantly lower than plots treated with Orthene 80SP (6.4 oz AI/cwt) seed protectant .

There was no significant treatment by soil type interaction observed for seedcotton yield. Combined across soil types, all insecticide treatments resulted in significantly greater seedcotton yields than the untreated control (Figure 5).

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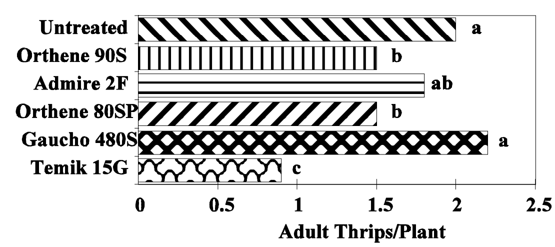

Figure 1. Efficacy of at-planting insecticides against adult thrips combined across soil types.

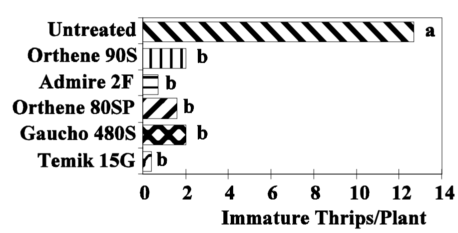

Figure 2. Efficacy of at-planting insecticides against immature thrips; Commerce silt loam, St. Joseph.

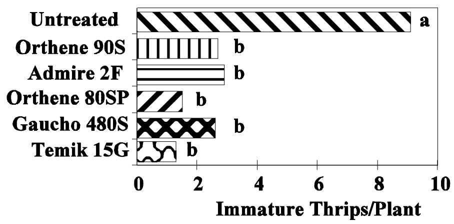

Figure 3. Efficacy of at-planting insecticides against immature thrips; Gigger silt loam soil, Winnsboro.

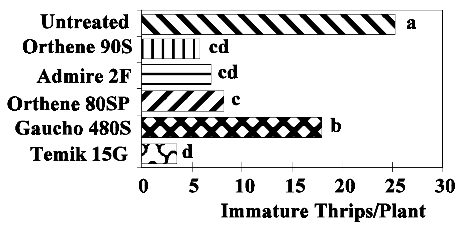

Figure 4. Efficacy of at-planting insecticides against immature thrips; Sharkey clay soil, St. Joseph.

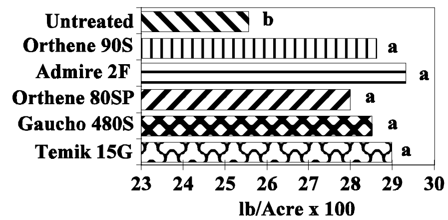

Figure 5. Effect of at-planting insecticides on seedcotton yield combined across soil types.