RESULTS OF INSECTICIDE TREATMENTS ON EARLY SEASON THRIPS POPULATION AND DAMAGE

C. D. Capps and L. Earnest
Arkansas Agricultural Experiment Station
Rohwer, AR
C. Allen and M. Kharboutli
Arkansas Cooperative Extension Service
Monticello, AR

Abstract

Four tests were conducted over the two year period of 1998-1999 to determine what treatments would control thrips populations and damage. Most treated plots did not show a significant difference in yield, but numerical trends consistently favored Temik, Admire, and Gaucho. Also, few significant differences in thrips counts existed, but trends in thrips counts favored Temik. The least amount of damage generally showed up in the Admire, Temik, and Gaucho treatments. Adage also looked good in the trial in which it was used.

Introduction

Thrips are a major pest in cotton causing yield loses, extensive foliage damage, and delay maturity of the crop. These tiny insects are difficult to scout for and to control with foliar insecticides. Foliar insecticides normally provide only short intervals of thrips control, leaving the crop vulnerable to damage for extended periods of time. Taking a preventative approach with systematic, in-furrow insecticides has provided consistently higher yields and economic returns. To determine the severity of loses associated with thrips, one trial was conducted in 1998 and three in 1999. The trials were very useful in showing the better treatments, including some newer products that are available to control thrips.

Objective

Determine the efficacy of selected in-furrow and foliar applied insecticides for thrips control in cotton for 1998 and 1999.

Methods and Materials

1998

Cotton was planted on 5-6-1998 on a loam soil on the Southeast Branch Experiment Station near Rohwer, Arkansas. Plots were four rows wide by 40 feet long and arranged in a Randomized Complete Block Design. All insecticides were applied at planting in 1998 as in-furrow treatments. The granular insecticides were dropped in-furrow using the granular applicator on a John Deere 7300 Maxemerge planter. Treatments were randomly assigned to plots and replicated four times. Standard field preparations and practices were used.

At planting, standard herbicide and fungicide practices were used on all treatments. Standard irrigation practices included four irrigations applied as need according to the irrigation schedular model. Stand count was made by counting all plants in six row feet per plot on June3 and 9.

Damage due to thrips injury was visually evaluated on May 25 and June 6 by rating each plot by indexing plant height, vigor, and foliage distortion. Thrips samples were taken on May 19, 26, and June 3. Ten plants were cut about an inch above the soil line and placed in Ziplock plastic bags. Thrips were washed from the plastic bag using soapy water and isopropyl alcohol. Thrips were then collected onto 7cm filter paper using Buchner funnels. A vacuum pump was used to facilitate rapid filtration of the thrips from the wash solution. Thrips were then counted under 10 and 20x magnification in the laboratory. Cotton was harvested on 9-30-98.

Data were processed using the Agriculture Research Manager (ARM) and CoStat. An ANOVA was run and LSD was used to separate the means.

1999

Three tests were conducted at three different locations in 1999. Test I was planted on May 13 with the variety NuCotn 33b. Tests II and III were planted on May 10 with the variety Paymaster 1560 BG. Plots were four rows wide by 40 feet long and arranged in a Randomized Complete Block Design. Treatments were applied either as foliar sprays May 24, June 1, and 6 or as in-furrow treatment followed by side dress treatment either 26 days after planting or at pin head square. Treatments were randomly assigned to plots and were replicated four times. Standard field preparations and practices were used.

At planting, standard herbicide and fungicide practices were used on all treatments. Standard irrigation practices included six irrigations applied as needed according to the irrigation schedular model. Stand count was made by counting all plants in six row feet per plot on.

Damage due to thrips injury was visually evaluated on May 25 and June 6 by rating each plot indexing plant height, vigor, and foliage distortion. Thrips samples were taken on May 27, June 4, and 9 for Test I. For Test II, thrips samples were taken on May 24, June 1, and 7. And for Test III, thrips samples were taken on May 28, June2, and 8. Plants were sampled and thrip collected from them using the methods

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described above. Test I was harvested on 10-10, Test II on 10-5, and Test III on 10-26.

Data were processed using the Agriculture Research Manager (ARM) and CoStat. An ANOVA was run and LSD was used to separate the means.

Results

Effects on Thrips Population

Generalizing across tests, treated plots had fewer thrips in both years than the untreated plots. Temik 15G at .75 lb ai/ac, Orthene seed treatment, and in-furrow Admire 2F plus Orthene 90S were very effective in controlling thrips in the 1998 test. Admire 2F at both rates and Thimet 20G,however, had numerically higher thrips counts than other treatments in the 5-19-98 sampling.

In 1999, all treatments controlled thrips in Test I, but Temik Admire, and Adage were the most effective on the first two sampling dates while a trend existed toward higher thrips populations in the Gaucho seed-treatment and Orthene foliar plots.

In Test II, all treatments controlled thrips on all sampling dates but only the biological treatment consistently produced thrips counts that were similar to those in the check plots.

In Test II, all treatments did well with the biological treatment again proving ineffective against thrips while Orthene (0.25 lb/ac) was effective on 6-2-99 but not on 5-28-99. On the 6-8-99 sampling, only Temik treatments, DiSyston, Admire + Nemacur, and Orthene 90S (0.25 lb/ac) significantly reduced thrips counts compared to the check treatments.

Thrips Damage

All treatments significantly reduced thrips damage compared to the check plots in 1998 and 1999 with the exception of Test III where damage in plots treated with Orthene or the biological treatment was similar to that of the untreated check.

Phytotoxicity Ratings

Phytotoxicity ratings (1998) were high in plots treated with Thimet and the high rate of Temik. Increasing the rate of Temik resulted in higher phytotoxicity effect on cotton seedlings (non-significant, positive correlation). Stand counts reflected the phytotoxic effects of chemicals on plants. Stand counts in 1998 were significantly lower in plots treated with Temik 15g at 1.05 lb ai/ac than in any other treatment. A strong negative correlation existed in plots treated with high rates of Temik in 1998 between phtotoxicity rating and stand count. Gaucho ST, Admire 2F (at the two rates used), and Orthene ST tended to have the least level of phytotoxicity and highest plant stand count. No significant differences existed among treatments in 1999.

Yields

No significant differences in lint yields among the treatments existed in 1998. Admire 2F (0.05lb ai/ac) produced numerically the highest yield while Thimet 20G produced the least.

In Test I (1999), there were no significant differences in yields, but a numerical trend supported Admire and Temik as the strongest treatments. In Teat II (1999), Admire (0.05 lb ai/ac), DiSyston (0.98 lb/ac), and Guacho + Nemacur produced significantly more cotton than the untreated check. In Test III (1999), all treatments except for the biological treatment produced more lint than the untreated check.

Conclusions

In both years, there were no significant differences in yields. Even though no significant differences existed, numerical trends consistently favored Temik, Admire, and Gaucho.

Temik treatments had consistently low thrips counts, but Temik shares the lowest damage ratings with Admire and Gaucho. This is probably due to the neo-nicotinoid chemistry of Admire and Gaucho (along with the new product Adage). These products are generally slow to kill the insects but quickly stop their feeding.

Admire, Temik, and Gaucho were the treatments that showed the least amount of damage. Adage was also good at preventing feeding damage in the one test in which it was used.

References

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