INSECT PEST MANAGEMENT IS ALIVE AND WELL IN TENNESSEE

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Abstract

Studies were conducted in 2010, 2014, and 2015 at the West Tennessee Research and Education Center in Jackson, TN. The objective of this research was to demonstrate the value of foliar insecticides as part of an integrated pest management (IPM) approach to reduce the threat of crop loss from several important cotton pests that have thrived after the eradication of the boll weevil. Foliar insecticides successfully controlled damaging insect pests during the flowering period. The use of foliar insecticides as part of an integrated pest management program resulted in significant increase in cotton yield all three years of the study. Additionally, foliar insecticides provided a substantial increase in crop value each year of this trial.

Introduction

Insect control in cotton has come a long way in the past two decades. Varieties with multiple Bt traits have greatly reduced the potential impact of caterpillar pests. Insecticide seed treatments (ISTs) have helped simplify thrips control, and most importantly, boll weevil eradication has eliminated the number one pest of Tennessee cotton. However, other pests, such as plant bugs and stink bugs, remain and have thrived in the current production system.

An integrated pest management (IPM) program integrates control tactics including cultural control, variety selection, biological control, and insecticides to manage insect pest populations at or below the level that causes damage or loss, while minimizing adverse impacts on society and the environment. These tools used together combat insect pests that destroy our crops and rob our yields. Additionally, utilizing these tactics manages the crop for earliness, which is imperative here in the northern Cotton Belt.

Methods and Materials

These tests were done at the West Tennessee Research and Education Center in Jackson, TN in order to demonstrate the value of foliar insecticides as part of an integrated pest management system to reduce the threat of crop loss from several important cotton pests. Phytogen® 375 WRF (WideStrike) cotton was planted no-till May 7, 2010 and May 12, 2014. Phytogen® 333 WRF (WideStrike) cotton was planted no-till May 11, 2015. Individual plots were 8 rows (38 inch centers) x 35 feet. Treatments were replicated in a randomized complete block design. All agronomic practices such as fertilization, seeding rates and control of insect pests followed University of Tennessee recommendations.

Plots were scouted using proven sampling methods throughout the growing season. Pre-bloom foliar insecticides were not used in 2010 but were in 2014 and 2015. Foliar applications for the control of insect pests during the flowering period of cotton were made only when established economic thresholds were met or exceeded. Five applications were made during bloom in 2010, four in 2014, and three in 2015. Insecticides used were local standards such as Acephate, Acephate + Brigade (bifenthrin), Transform WG (sulfoxaflor), or Bidrin XP II (bifenthrin + dicrotophos) depending on the pest spectrum present at the time of application. Yield data were collected on September 20, 2010, October 22 and November 2, 2014 and October 1, 2015 by harvesting the center two rows of each plot. Lint yield was calculated using a 40% gin turn out and a lint value of $0.70 per pound.

Results and Discussion

Plant bug, stink bugs and bollworm were the primary targets of insecticide applications made in these tests. The tarnished plant bug was the most common pest, and populations in non-treated plots greatly exceeded the recommended treatment threshold of six or more insects per 10 row feet (Fig. 1). Foliar insecticides successfully controlled damaging insect pests during the flowering period. The use of foliar insecticides as part of an integrated pest management program resulted in significant increase in cotton yield all three years of the study. Compared to plots not treated with insecticide once blooming began, lint yield was increased 1002, 632, and 515 pounds per acre

in 2010, 2014, and 2015, respectively (Fig. 2). This provided a substantial increase in crop value of $701, $387, and $317 per acre in 2010, 2014, and 2015, respectively. This figures in the cost of insecticide and application and lint value calculated at $0.70/lb.

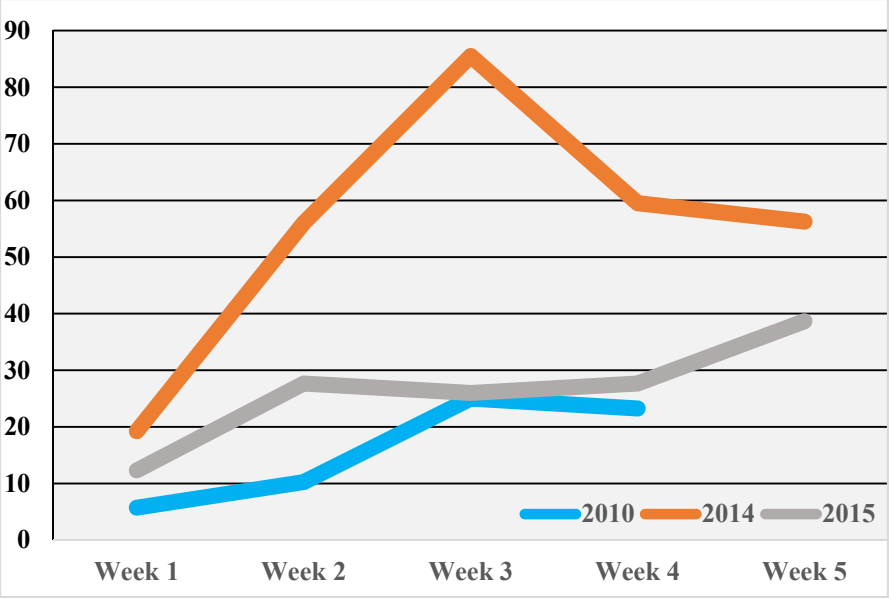

Figure 1. Total plant bugs per 10 row feet in non-treated plots during flowering.

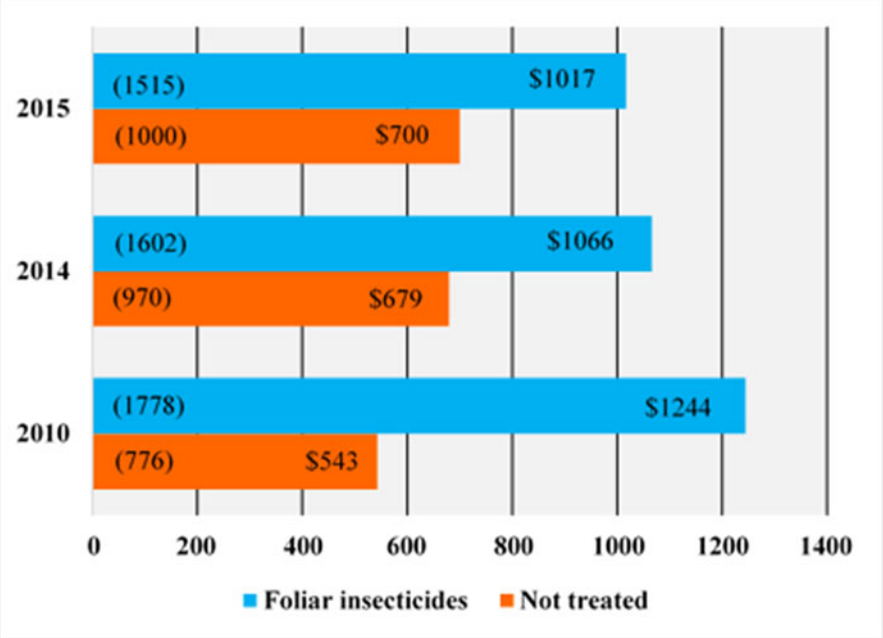

Figure 2. Lint yield (lbs/acre, in parentheses) and gross crop value ($/acre; lint @ $0.70/lb)

Some examples of important IPM tools implemented in this study include choosing a variety of acceptable maturity in this area. This is especially important in the northern Cotton Belt where managing for earliness is imperative. Planting a cotton variety containing Bt traits reduced the threat from caterpillar pests. A timely planting date helped manage for earliness and avoided typically higher late-season infestations from insect pests. The use of an insecticide seed treatment reduced early-season thrips numbers. Recommended nitrogen rates avoided excess growth. Scouting was done regularly and established sampling methods were used. Foliar applications were used only when UT recommended economic thresholds were met or exceeded. This helps preserve beneficial insects also. Recommended insecticides at proper rates were applied for the pests present. Multiple modes of action were used and insecticides classes were rotated to combat insect resistance development.

Summary

Technological advances have simplified pest management in cotton, but insects still have the potential to cause substantial if not catastrophic damage if not properly managed. These data show that foliar insecticides are a vital component on an IPM program in Tennessee cotton.

Acknowledgements

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