THRIPS MANAGEMENT: USE OF FOLIAR INSECTICIDE SPRAYS TO SUPPLEMENT PREVENTIVE TREATMENTS BASED ON THRIPS RISK ASSESSMENT

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Introduction

Thrips are consistent and predictable insect pests of seedling cotton in Georgia and the southeastern US. Thrips infest cotton at emergence and initially feed on the lower surface of cotyledons prior to feeding in the terminal bud of developing seedlings. Excessive thrips feeding results in crinkled malformed true leaves, stunted plants, delayed maturity, reduced yield potential, and in severe cases loss of apical dominance and stand loss. Cotton seedlings are most susceptible to thrips during the early stages of development (cotyledon thru 2-leaf). Once seedlings reach the 4-leaf stage and are growing rapidly, thrips are rarely an economic concern.

Preventive insecticide treatments at planting are used by most growers for early season thrips control. The most common preventive treatments include the systemic insecticides imidacloprid or thiamethoxam applied as a commercial seed treatment. Both imidacloprid and thiamethoxam are neonicotinoid insecticides. Performance in Georgia has historically been similar when used as a seed treatment for thrips control; thus we will refer to these insecticides collectively as neonicotinoid seed treatments (NST).

Neonicotinoid seed treatments are active on thrips for about 21 days after planting (DAP); however, supplemental foliar sprays are needed in some environments (high thrips populations and/or extended infestations). There are two cultural practices that have a significant impact on thrips populations: 1) planting date and 2) tillage practice. Thrips infestations are typically higher on cotton planted during April and early May compared with late May and June plantings. Thrips infestations are also significantly greater in conventional tillage systems compared with reduced tillage systems. A risk index of thrips infestations may be predicted for cotton planted based on these two cultural practices, planting date and tillage practice. Cotton planted in April or early May in a conventional tillage system would be considered “high risk” for thrips. Whereas cotton planted after mid-May and/or in a reduced tillage system would be considered “low risk” for thrips. The objective of this study was to quantify the effect of a supplemental foliar insecticide spray when an NST is used in high- and low-risk thrips environments.

Materials and Methods

Data was summarized from small plot trials conducted by the University of Georgia, which included an NST with and without a foliar insecticide spray at the 1-leaf stage. In total 23 trials conducted from 2001 to 2013 were included in the data summary. Individual trials were assembled into “risk groups” based on planting date and tillage practice. Trials that were planted prior to May 10 in a conventional tillage system were placed in the high-thrips-risk group. Whereas trials planted after May 10 and/or in a reduced tillage system were placed in the low-thrips-risk group. Trial yields from the NST alone and the NST+foliar 1-leaf treatment were compared in each risk group using a paired t-test.

Results and Discussion

Sixteen trials were placed in the high-thrips-risk group and seven trials were placed in the low-thrips-risk group. The yield response associated with using an NST compared with no insecticide (NST minus no insecticide) is illustrated in Figure 1. Yields were numerically increased in 22 of 23 trials with an average yield increase of 251 pounds lint per acre when an NST was used compared with no insecticide plots. Yield responses tended to be greater in trials conducted in high-risk environments. On average yields were 308 and 121 pounds lint per acre higher when compared with no insecticide plots in high- and low-risk environments, respectively. This consistent yield response to NSTs is why most growers use preventive insecticides at planting for thrips control.

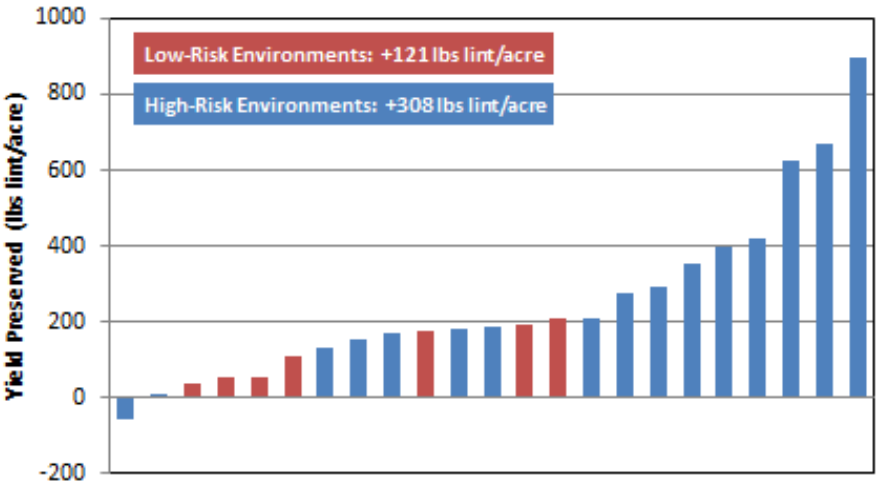

Figure 1. Yield Response to Thrips Control

Neonic Seed Treatments, 23 Trials (2001-2013)

Foliar insecticide (generally acephate at 0.18 lb ai/acre) was applied at the 1-leaf stage. On average the foliar insecticide was applied at 16 DAP with a range of 13-20 DAP. Figure 2 illustrates mean yield for no insecticide, NST, and NST+foliar 1-leaf in the low-risk and high-risk groups. Yields were not statistically different (prob (t) = 0.6043) for NSTs with and without a supplemental foliar spray in the low-risk environment, 1,335 pounds lint and 1,348 pounds lint per acre, respectively. Whereas, the NST+foliar 1-leaf treatment had significantly higher yields (prob (t) = 0.0122) compared with the NST alone in the high-risk environment, 1,526 pounds lint and 1,457 pounds lint per acre, respectively.

In summary, commercial seed treatments including imidacloprid or thiamethoxam provide similar levels of thrips control and are active on thrips for about three weeks after planting. Neonicotinoid seed treatments provide a consistent yield response in both low- and high-thrips-risk environments. However, research and observation have shown that a supplemental foliar insecticide spray is often needed in addition to an NST when thrips infestations are high, i.e. a

high-thrips-risk environment. All cotton should be scouted on a regular basis for thrips and other insect pests, but we should expect higher thrips populations on cotton planted prior to May 10 in a conventionally tilled system compared with cotton planted after May 10 and/or in a reduced tillage system. Unless frequent and thorough scouting reveals thrips populations are below the threshold of two to three thrips per plant with immatures present, a foliar thrips systemic insecticide should be applied at the 1-leaf stage in conventional tilled fields planted prior to May 10 when an NST is used.

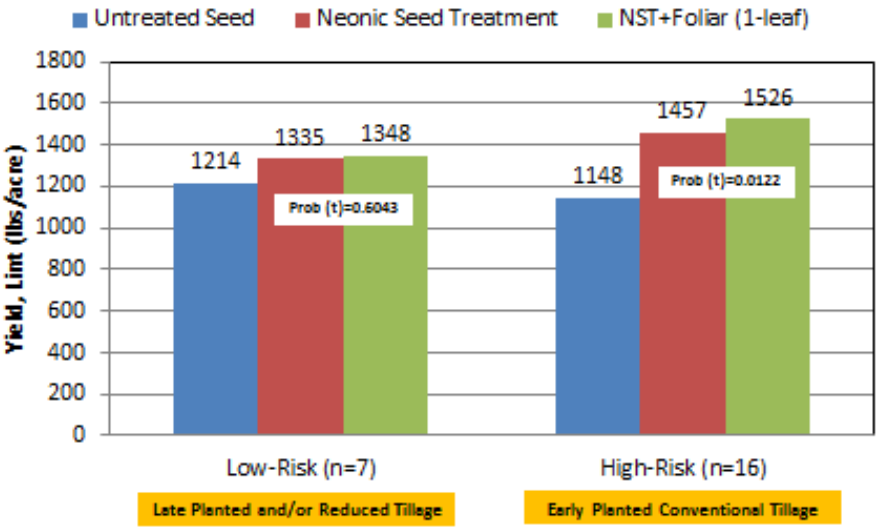

Figure 2. Yield Response to Thrips Management in Low Risk and High Risk Environments

In most situations an NST plus a foliar insecticide at the 1-leaf stage provides good thrips control, but fields should be scouted regularly for thrips and injury following the foliar spray until seedlings reach the 4-leaf stage and are growing rapidly. In fields planted after May 10 or where reduced tillage is used, the risk of damaging thrips infestations is lower, and an automatic foliar spray should not be applied when an NST is used. Fields in this low-thrips-risk environment should be scouted and treated in a timely manner when thresholds are exceeded.

Acknowledgement

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