EVALUATION OF AUTOMATIC INSECTICIDE APPLICATIONS FOLLOWING PREVENTATIVE INSECTICIDES FOR THRIPS: PRELIMINARY RESULTS FROM A REGIONAL PROJECT

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Abstract

Small-plot experiments were conducted across the cotton belt to determine if automatic foliar applications made to cotton that had received a preventative insecticide would be economically viable, and if so, which timing these applications would most contribute to yield. Many locations received excessive rainfall in 2009, which confounded data from these areas. Therefore, only two locations are briefly summarized here. These trials will be conducted at least one more season across all (20+) locations from Texas to Virginia to determine the value of automatic insecticide applications for thrips following preventative insecticides.

Introduction

There are several economically important species of thrips in upland cotton across the Mid-south and Southeast (Greene et al. 2003). To minimize losses due to this pest, growers in these regions treat a significant percentage of the cotton acreage with preventative insecticides applied either onto the seed or into the seed furrow at planting. Although these preventative treatments are generally effective, supplemental foliar applications are sometimes required when high populations of thrips are present, or when at-plant treatments are ineffective due to extreme weather conditions (e.g., rainfall). While a certain percentage of foliar applications for thrips are warranted, some cotton acreage receives automatic foliar applications regardless of thrips numbers or associated damage, whereas treatment decisions are often based on plant stage, or even for the sake of convenience when insecticides are tank-mixed with post-emergence herbicide applications (e.g., glyphosate). The value or economic benefit of these applications is not well documented. Experiments were be performed at multiple locations across the Mid-South and Southeast to determine (1) whether these supplemental foliar applications made following preventative treatments for thrips are economically viable, and if so, (2) to determine the most effective number and timing of those applications.

Materials and Methods

Trials were conducted at >20 locations throughout the cotton belt from Texas to Virginia. Plot size was 4 rows x 50 feet and arranged in a randomized complete block design with factorial arrangement of treatments (3 x 4, 4 replications). Treatments consisted of two factors including 'Factor A' (at-plant insecticide) and 'Factor B' (automatic application timing of foliar insecticide). 'Factor A' consisted of no seed preventative insecticide, Aeris® seed treatment, or Temik® 15G (5.0 lbs/A) applied in-furrow. 'Factor B' consisted of no foliar application, an automatic application at 1-2 true leaves, an automatic application at 3-4 true leaves, or automatic applications and 1-2 and 3-4 true leaves. Varieties were chosen based on optimal agronomics/insect protection (e.g., Bollgard II or WideStrike) for each location. Seed-cotton yield was recorded from the middle two rows and analyzed with various secondary data such as thrips numbers, weather data, nematode samples, days to emergence, plant stage at each sampling, and a maturity rating of the approximate date when the plots reached NAWF5. Yield data in this report were analyzed using SAS.

Results and Discussion

Due to excessive rainfall at many Mid-south locations, only two were selected to be summarized. At Stoneville, MS, there was a significant interaction between at-plant insecticide x foliar timing (P [AB]=0.0137, Table 1). Differences in yield were variable, but there appeared to be a trend indicating that the automatic application at the 3-4 leaf stage may have contributed to yield at this particular location. This suggests that an economically significant population of thrips may have occurred during this stage of plant growth.

Table 1. Stoneville, MS seed cotton yield

	Application Timing			
Preventative	UTC	1-2 leaf	3-4 leaf	1-2 & 3-4 leaf
UTC	736 cd	744 cd	710 d	827 ab
Aeris	767 bcd	779 bcd	853 a	800 abc
Temik 5 lb/A	759 bcd	802 abc	770 bcd	778 bcd

Means across all columns/rows followed by the same letter are not significantly different (Duncan's New MRT P=0.0054, P[AB]=0.0137).

At Suffolk, VA, there was no interaction between at-plant insecticide and foliar timing (P[AB]=0.2002). Across all foliar application timing treatments, plots receiving at-plant insecticide yielded higher than those containing no preventative insecticide (P<0.0001). Additionally, Aeris as the at-plant insecticide significantly improved yield over that of Temik (Table 2).

Table 2. Effect of at-plant insecticide on yield across all automatic foliar insecticide timings.

Preventative	Seed cotton Yield
UTC	1180 c
Aeris	1494 a
Temik 5 lbs/A	1333 b

Means in the same column followed by the same letter are not significantly different (Duncan's New MRT P<0.0001, P[AB] = 0.2002).

Across all at-plant insecticides, treatments containing an automatic foliar insecticide application at the 1-2 leaf stage significantly improved yield over the 3-4 leaf application alone and the untreated check (P<0.0001, Table 3).

Table 3. Effect of automatic foliar insecticide timing on yield across all at-plant treatments.

Foliar Timing	Seed cotton yield
UTC	1210 c
1-2 leaf	1409 a
3-4 leaf	1312 b
1-2 & 3-4 leaf	1413 a

Means in the same column followed by the same letter are not significantly different (Duncan's New MRT P<0.0001, P[AB] = 0.2002).

Results from Virginia, one of the few locations that were not hampered by excessive rainfall, suggest that the automatic application at 1-2 leaves yielded higher than the automatic application at the 3-4 leaf stage. This was likely due to an economically significant infestation of thrips during the earlier (i.e., more susceptible) stage of cotton growth at this location.

Overall, rainfall affected most locations throughout the Mid-south, resulting in low thrips numbers and confounding yield data. Since observations may be markedly different under normal rainfall conditions and temperatures conducive for optimum cotton production, this research will be repeated in 2010 and perhaps 2011 to evaluate these automatic applications.

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References

Greene, J., C. Allen, D. Johnson, G. Lorenz, G. Studebaker, E. Burris, R. Bagwell, D. Cook, B. Freeman, G. Herzog, G. Lentz, R. Leonard, and J. Reed. 2003. Thrips (Thysanoptera: Thripidae) A Multi-State Survey: Summary of Observations for Arkansas, Alabama, Georgia, Louisiana, Mississippi, and Tennessee. University of Arkansas Division of Agriculture Extension Publication AG-754.