PRECISION PLACEMENT OF IN-FURROW INSECTICIDE FOR EARLY SEASON THRIPS CONTROL

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Abstract

A significant acreage of Georgia cotton is planted in hills spaced 9 to 15 inches apart. However, preventive insecticides for thrips control are evenly distributed between hills. Two field trials were conducted to evaluate the potential of precisely placing systemic insecticide granules with seed for thrips control. Results from these trials suggest precision placement of insecticide near the seed may provide acceptable thrips control; possibly at reduced rates compared with conventional granule application methods. Additional studies verifying efficacy and refinement of insecticide rates are needed in the future.

Introduction

Early season thrips are an annual pest of cotton in Georgia. Thrips damage tender leaves and the terminal bud by rasping plant tissue with their mouthparts and feeding on the escaping juices. High populations of thrips move from alternate hosts into newly emerged cotton fields. If populations are not controlled, thrips can cause considerable stunting of plants which complicates post directed herbicide applications due to poor seedling growth. Thrips injury may also cause reduced yields, delays in maturity, and in severe cases cause stand loss.

Application of a preventive insecticide at planting is a recommended practice in Georgia to reduce thrips injury. The use of a systemic insecticide applied in-furrow at planting is a standard practice for most growers. Often these treatments will reduce thrips numbers to acceptable levels when seedlings are most susceptible. Once seedlings attain the 5-leaf stage and are growing rapidly, the likelihood of thrips injury is reduced. However, supplemental foliar sprays may be needed if high populations persist or environmental conditions are not conducive for plant uptake of the preventive insecticide.

A significant acreage of cotton in Georgia is hill planted. In contrast to evenly spacing seeds in the furrow, hill-drop planting places 2-4 seeds in a group every 9 to 15 inches. Number of seed planted per hill and spacing between hills varies by grower preference. However, when hill-drop planting is used, in-furrow insecticides are evenly distributed in the seed furrow. This poses the question; Is the insecticide placed between the hills being utilized by the plants when most vulnerable to thrips injury (less than the 4-leaf stage)? Our objective was to evaluate the potential efficacy of hill dropping insecticide granules with cotton seed for early season thrips control. It is theorized that by precisely placing the insecticide near the seedlings that plants can better utilize available insecticide or take up the insecticide more efficiently when they are most vulnerable to thrips injury.

Methods

Field plots were established at the University of Georgia Plant Science Farm (PSF) in Oconee County GA and the Coastal Plain Experiment Station (CPES) in Tift County GA. Treatments were replicated four times and arranged in a randomized complete block design. Four row plots 25 feet in length were used at the PSF and treatments included an untreated check, Temik 15G at 3.5 and 7 lbs. product per acre, and Temik placed near the seed in a hill-dropped plot. Plots were planted with DP 90 cottonseed on May 16, 1997. A V-belt push planter was used to incorporate Temik granules in the furrow after planting approximately 5 seed evenly spaced per row foot. A jab-planter was used to hill drop three seed and 0.08 g Temik 15G per hill every 12 inches; both seed and insecticide were placed in a localized area using this hand planting method. The actual rate of Temik 15G utilized in the hill planted treatment was 2.5 lbs. per acre. Two row plots 10 feet in length were used at the CPES location. Plots were planted with PM 1220 BG/RR on May 20, 1997. Three seed were hill-dropped every 12 inches with a jab-planter. Treatments included and untreated check, and Temik 15G at 0.04 g and 0.08 g precisely placed per hill (actual rate 1.25 and 2.5 lbs Temik 15G per acre).

Thrips populations were sampled by immersing four or ten seedlings randomly selected in containers with 70 percent alcohol. Immature and total thrips were counted in the lab using a dissecting microscope. Average height in each plot was attained by measuring 10 or 20 consecutive plants. The center two rows of plots at the PSF were machine harvested on December 1, 1997 and plots were hand harvested at the CPES location on October 6, 1997.

Results

Plant Science Farm, Oconee County GA

Thrips populations were moderate to high in the PSF experiment. The untreated plot exceeded the recommended threshold of 2-3 thrips per plant on all sample dates. Immature thrips counts are generally considered a better indicator of treatment performance when evaluating thrips insecticides. On all three sample dates immature thrips counts were significantly less than the untreated (Table 1). The hill dropped plot had numerically fewer thrips than Temik at 3.5 and 7.0 lbs per acre, but were not statistically different. Untreated plots were significantly shorter; greater

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than two inches shorter than Temik treatments. Yields in Temik treatments were also significantly greater than the untreated.

Coastal Plain Experiment Station, Tift County GA

Thrips pressure was light in the CPES trial. Total thrips per plant never exceeded threshold levels. No significant differences between treatments were observed in immature thrips counts, plant height, or yield (Table 2). However, hill dropped plots were numerically better than the untreated for all ratings.

Discussion

Early season thrips will continue to be an important pest of Georgia cotton. If left uncontrolled, damage can be significant. These preliminary studies suggest that there is potential to precisely place systemic insecticides when hill planting cotton and achieve acceptable thrips control. Reduction in insecticide rates applied per acre may be possible. At this point in time there is not an applicator to apply granules in this fashion, but it does appear feasible. There are many unanswered questions concerning this application method such as application rates, efficacy, and application feasibility which need to be addressed.

References

Herzog, G.A. and R.J. Ottens. 1997. Evaluation of insecticides for control of thrips in seedling cotton, in 1996 Georgia Cotton Research - Extension Report, UGA/CPES Research Extension Publication No. 4.

Roberts, P.R. 1996. Insect Control, in 1997 Cotton Production Guide, The University of Georgia Cooperative Extension Service CSS97-02.

Table 1. Immature thrips populations at 17, 24, and 31 days after planting, plant height at 52 days after planting, and lint yield per acre. University of Georgia Plant Science Farm, Oconee County GA.

	Immature Thrips per Plant				
Treatment	6/2	6/9	6/16	Height (inches)	Yield (lb lint/a)
Untreated	4.5a[1]	7.8a	7.1a	6.7a	343a
Temik 15G 3.5 lb/a IF	0.4b	1.8b	2.4b	9.2b	589b
Temik 15G 7.0 lb/a IF	1.0b	0.9b	1.7b	10.0b	528b
Temik 15G 0.08 g/hill	0.1b	0.1b	0.1b	9.1b	520b

[1] Means followed by the same letter within a column are not significantly different (Tukey's Studentized Range (HSD) p=0.05)

Table 2. Immature thrips populations at 14, 22, 28, and 35 days after planting, plant height at 35 days after planting, and lint yield per acre. University of Georgia Coastal Plain Experiment Station, Tift County GA.

	Immature Thrips per Plant					
Treatment	6/3	6/11	6/17	6/24	Height (inches)	Yield (lb lint/a)
Untreated	0.19	1.13	0.31	1.19	6.2	846
Temik 15G 0.08 g/hill	0.06	0.25	0.13	0.25	6.6	989
Temik 15G 0.04 g/hill	0.13	0.25	0.13	0.13	6.7	989