

IMPACT OF DIMILIN ON GRASSHOPPERS IN SEEDLING COTTON

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Introduction

Grasshoppers are an uncommon insect pest of cotton in Georgia. When present, grasshoppers are most often observed in conservation tillage fields and field margins during May and June and economic damage is possible if high populations are present. Grasshoppers will feed on leaves and stems of seedling cotton. Stem feeding appears to be more damaging in that plant populations are negatively impacted. Stem feeding by grasshoppers is similar in appearance to cutworm injury, but grasshoppers typically do not completely cut plant stems. However, the stem is weakened on damaged plants which will often tip over and eventually die. Decisions to treat grasshoppers should be based on stand counts, percent damaged plants, and the presence of grasshoppers. If the stand is threatened, treatment is recommended. Several insecticides are registered for grasshopper control. Nymph or wingless grasshoppers are relatively easy to control, however winged adults tend to be more difficult to control and higher rates of insecticide will be needed.

Weather is the most important factor influencing grasshopper numbers. Low rainfall produces environmental conditions that increase grasshopper populations by enhanced ovipositional rates along with increased egg and nymph survival. Two or more consecutive years of drought predispose the development of outbreak populations during subsequent years (DeGooyer and Browde, 1994, in ESA Handbook of Soybean Insect Pests). Grasshoppers overwinter as eggs deposited in the soil and emerge in the spring. Perhaps this explains why we tend to see more grasshoppers in reduced tillage situations. Dimilin is an insect growth regulator with residual activity which has demonstrated control of grasshopper nymphs in grasslands. The objective of this trial was to evaluate the insect growth regulator Dimilin for control of grasshoppers in cotton.

Materials and Methods:

Treatments were established in two reduced tillage cotton fields located in Cook County GA which were infested with grasshoppers. Respective treatments were applied to half of each field on May 2 (1-leaf cotton) and included Scout X-TRA at 3 ozs/A and Dimilin at 2 ozs/A. On May 6, Scout X-TRA was also applied in the Dimilin plots since Dimilin has slow activity and grasshoppers were continuing to damage seedlings. Grasshopper populations exceeded 1 per three row feet. Grasshopper counts were made on May 9, 15, and 22 by walking 100 feet perpendicular to rows and counting the number of grasshoppers on a 6 feet wide area for a total 600 square feet. Plant populations and grasshopper damaged plants were quantified per 100 row feet on May 15. Data were collected at five locations in each plot for a total of 10 replications. Data were analyzed using a paired t-test.

Results and Discussion

Although untreated plots were not available for comparison, grasshopper infestations were drastically reduced in both fields (approximately 90 percent when compared with pre-treatment counts) following treatment with Scout X-TRA. Although low populations remained, significantly fewer grasshoppers were observed in Dimilin followed by (fb) Scout X-TRA plots compared with plots treated with Scout X-TRA only at one, two, and three weeks after application (Table 1). The number of grasshopper damaged plants and percent grasshopper damaged plants were not significantly different at two weeks after treatment (Table 2). However, significantly fewer plants per 100 feet were observed in the Dimilin treatment. This reduction in plant population most likely occurred in the four days prior to Scout X-TRA being applied on the Dimilin plot. Perhaps a tank-mix of Scout X-TRA and Dimilin would have been a better treatment than Dimilin alone since stand loss was occurring when the Dimilin was applied. Insecticidal activity of Dimilin is generally not observed for several days following application. An alternative treatment scenario worthy of investigation is the application of Dimilin at or prior to planting so that grasshoppers could be controlled prior to seedling emergence. In this trial, significant residual control was observed where Dimilin was applied.

Table 1. Grasshopper infestations following treatment with Scout X-TRA and Dimilin followed by Scout X-TRA in seedling cotton, Cook County GA, 2003.

Treatment	Grasshoppers per 600 square feet		
	May 9	May 15	May 22
Scout X-TRA 3 ozs/a	10.8	13.1	8.1
Dimilin 2 ozs/a fb Scout X-TRA 3 ozs/a	2.3	1.1	1.5
Prob t	<0.001	<0.001	<0.001

Table 2. Plant population and grasshopper damaged plants following treatment with Scout X-TRA and Dimilin followed by Scout X-TRA in seedling cotton, Cook County GA, 2003.

Treatment	Plants per 100 row feet		Percent Grasshopper Damaged Plants
	Grasshopper Damaged	Total	
Scout X-TRA 3 ozs/a	16.8	135.3	12.38
Dimilin 2 ozs/a fb Scout X-TRA 3 ozs/a	15.6	120.8	12.84
Prob t	0.340	0.019	0.412