

EVALUATION OF DIMILIN FOR GRASSHOPPER CONTROL

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Introduction

Grasshoppers are sporadic pests of seedling cotton in Georgia. During outbreaks, significant damage, including stand loss, occurs due to stem and leaf feeding. Grasshopper infestations of economic importance are most often associated with reduced tillage fields. Grasshoppers emerge during the spring from eggs deposited in the soil the previous fall. It is probable that tillage destroys many eggs and is not conducive for nymphal emergence.

Control of grasshoppers with insecticides can be difficult. Nymphs or immature grasshoppers are easily controlled with low rates of numerous insecticides, however adult grasshoppers are difficult to control and high rates should be used. Grasshopper emergence may occur for several weeks, potentially requiring multiple applications for acceptable control in highly infested fields. Dimilin is an insect growth regulator that has long residual activity and has shown activity on immature grasshoppers. The objective in these trials is to quantify efficacy of Dimilin on grasshoppers.

Methods

Field trials were conducted in Cook and Crisp Counties to evaluate the impact of Dimilin 2L, which is an insect growth regulator, on grasshopper infestations in seedling cotton. At the Cook County location, treatments were established in a reduced tillage field that was heavily infested with grasshoppers. Respective treatments were applied to half of the field on May 12, 2004 and included Up-Cyde at 5 ozs/acre and Up-Cyde at 5 ozs/acre + Dimilin 2L at 2 ozs/acre. Both insecticide treatments were tank-mixed with Glyfos X-TRA at 1 qt/acre and ammonium sulfate at 25 lbs per 160 gallons of spray solution and applied at 20 gpa. Grasshopper counts were made on May 12 (pre-treatment), 19, and 27 by walking 100 feet perpendicular to rows and counting the number of grasshoppers on a six feet wide area for a total sampled area of 600 square feet. Data were collected in 7-12 areas per treatment.

The Crisp County location also consisted of a split field. Treatments were applied on April 27, 2004 in a reduced tillage field and included Dimilin 2L at 2 ozs/acre and an untreated control. Grasshopper counts were made on May 6, 10, and 19 as described above on a total area of 300 square feet. Data were collected in 4-11 areas per treatment. Data at both locations were analyzed using a t-test.

Results

Grasshopper populations were high, exceeding 200 per 600 square feet on May 12, at the Cook County location. Grasshopper damage to the existing crop was severe, resulting in approximately 80 percent stand loss, and the field was replanted following establishment of insecticide treatments. Dimilin is an insect growth regulator that only has activity on immatures and has slow activity. Since both adults and immatures were present, the pyrethroid Up-Cyde was applied at a high rate for control of adults and a quick knockdown of established populations prior to cotton emergence. Excellent control was observed in both treatments, reducing grasshopper populations below economically damaging levels (Table 1). However on May 19, the tank-mix of Dimilin and Up-Cyde had significantly fewer grasshoppers compared with Up-Cyde alone. Although a similar trend occurred on May 27, grasshopper populations were very low.

Table 1. Grasshopper infestations following treatment with Up-Cyde and Up-Cyde plus Dimilin in seedling cotton, Cook County GA 2004.

Treatment	Grasshoppers per 600 Square Feet	
	May 19	May 27
Up-Cyde 5 ozs/acre	7.08	1.14
Up-Cyde 5 ozs/acre + Dimilin 2L 2 ozs/acre	1.83	0.38
<i>Prob t</i>	<i>0.0071</i>	<i>0.1137</i>

* Pretreatment count: 200+ grasshoppers per 600 square feet.

Relatively low grasshopper populations were present at the Crisp County location. Although some plant feeding was observed in the untreated control, little if any stand loss occurred. However adequate populations were present for evaluation. Dimilin at 2 ozs/acre significantly reduced grasshopper populations on May 6 and 10 compared with the untreated (Table 2). Numbers had declined in both treatments on May 19.

Table 2. Grasshopper infestations following treatment with Dimilin in seedling cotton. Crisp County GA 2004.

Treatment	Grasshoppers per 300 Square Feet		
	May 6	May 10	May 19
Untreated	7.67	8.73	1.83
Dimilin 2L 2 ozs/acre	1.00	2.00	0.00
<i>Prob t</i>	<i>0.0073</i>	<i>0.0001</i>	<i>0.0748</i>

Grasshoppers are a sporadic pest and are somewhat unpredictable. These data demonstrate that Dimilin is a potential tool for use in a grasshopper management program. Careful scouting of grasshopper stage of development, adult vs. immature, is needed to assist with insecticide selection.