

Evaluation of Potential New Insecticide in Carrots for Lygus Control

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Abstract

Lygus bugs feeding on carrots grown for seed during flowering and seed maturation reduce seed viability. Potential new insecticides for control of lygus in carrots were evaluated in alfalfa and carrots plots at the Central Oregon Agricultural Research Center (COARC). Sulfoxaflor (Transform) and flupyradifurone (Sivanto) were compared to the industry standard, naled (Dibrom 8) plus lambda-cyhalothrin (Warrior II) and an untreated check. Although Transform was effective one week after application, Dibrom 8 plus Warrior II was the only effective treatment compared to the untreated check in subsequent evaluations and across the three sampling dates.

Introduction

Lygus bugs (*Lygus* spp.) that feed on carrots during flowering and seed maturation pose a risk to carrot seed viability. Dibrom 8 and Warrior II applied pre-bloom is the standard insecticide used to control and repel lygus bugs on carrots for seed. However, new product choices are needed to prevent insecticide resistance. In addition a product that is less harmful to predator mites would open the door for use of this biological control method to control two-spotted spider mites.

Methods and Materials

An existing alfalfa plot at COARC was used to evaluate product efficacy on lygus, as alfalfa is known to have relatively high populations of lygus. New products chosen for evaluation were Transform and Sivanto. These products were compared to the industry standard Dibrom 8 plus Warrior II and an untreated check. Plots 10 ft x 20 ft were replicated 4 times in a randomized complete block design. Treatments were applied on July 3, 2016 using a CO₂ powered backpack sprayer, hand-held boom, 8002 Teejet nozzles 18 inches apart, 40 psi and a carrier rate of 20 gal/acre.

Plots were evaluated weekly for lygus nymphs and adults using a sweep net on July 11, July 18 and July 25 following insecticide application on July 3, 2016. Ten sweeps were taken on each side of the plots and the number of lygus recorded. Due to crop lodging and trampling from foot traffic in the alfalfa plots, additional sweeps were taken July 26 and August 1 in carrot plots at COARC where Transform had been applied July 11 to evaluate bee repellency. Statistical analysis of the data was provided by Jeremiah Dung using Tukey's comparisons.

Results and Discussion

Results provided in this report are focused on lygus nymphs and do not include lygus adults, as they are much more mobile with the ability to move between plots. One week following insecticide application, Transform provided significantly greater lygus nymph control than

Sivanto compared to the untreated check, but not on subsequent sampling dates (Table 1). Two and three weeks after application, Dibrom 8 plus Warrior II was the only treatment significantly different than the untreated check, and the only treatment significantly different when averaging across the three sampling dates. There were no significant differences from lygus counts between Sivanto and the untreated plots in subsequent counts in the carrot plots.

Table 1. Lygus nymphs per plot based on 10 sweeps from each side of the plot for a total of 20 sweeps in alfalfa and carrot plantings at COARC, Madras, OR.

Treatment*	Rate/A	<u>Lygus Nymphs/Plot</u>						
		Alfalfa Plots					Carrots Plots	
		July 11	July 18	July 25	July 26	Aug 1		
Transform	2.75 oz	0.9 b	9.5 a	45.8 a	3.1	4.3		
Sivanto	14 fl oz	4.9 a	9.1 a	21.3 ab	---	---		
Dibrom 8	24 fl oz	1.9 ab	2.6 b	15.0 b	---	---		
+ WarriorII	1.92 fl oz							
Untreated	---	4.8 a	13.5 a	36.9 a	4.8 NS	4.3 NS		

*Applied July 3, 2016. All treatments included NIS at 1 qt/100 gal

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