Whitefly Control with Foliar Insecticides Following Imidacloprid in Cantaloupes

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Abstract

Foliar insecticides for whiteflies (Bemisia sp., WF) were applied as a supplementary control measure at 6 weeks after treatment with imidacloprid (Admire®) at planting time of melons. Beauveria bassiana fungus spores (Mycotrol®), pyriproxyfen (S-71639, Valent), and azadirachtin (Align®) are non-conventional insecticides that could be safer on beneficial parasites and predators. The number of eggs and nymphs counted at all rating dates for all treatments were not significantly different from the foliarly untreated check. Mycotrol treated melons showed higher number of nymphs following the second application. The Align treatment tended to exhibit higher number of nymphs after two applications. The addition of an adjuvant did not appear to enhance pyriproxyfen efficacy.

Introduction

Imidacloprid (Admire®) use in fall cantaloupes provides whitefly (WF) control for as long as 4 to 6 weeks after treatament when applied at planting time. The optimum length of control depends on the rate of Admire used and the proper placement below the seed for optimal uptake by the seedling. In the fall planted melons, if Admire treatments were not of adequate duration with severe WF pressures, supplementary control measures could be necessary. *Beauveria bassiana* fungus spores (Mycotrol®), pyriproxyfen (S-71639, Valent), and azadirachtin (Align®) are non-conventional insecticides that are safer on beneficial parasites and predators. The approach to this field study was to use a half rate of Admire, then follow with "soft" foliar insecticides to minimize the development of immature stages of WF in melons.

Materials and Methods

At the University of Arizona Maricopa Agricultural Center, Maricopa, AZ, on 09 Aug 1995, cantaloupe was direct-seeded in a single row on 40-inch beds spaced 10 feet apart. Imidacloprid at 0.125 lb a.i./A was applied in-furrow with a shank in front of the planter dropping the seed and approximately 1-inch below the seed. Weekly applications of foliar insecticides were initiated when immature stage WF appeared on the plants and were made on 20 and 27 Sep and 04 Oct. Applications were made with a hand-held boom with two TX-10 hollow-come nozzle tips spaced 20-inches apart and delivered 30 gpa water pressurized with a CO2 backpack sprayer at 45 psi. The foliar treatments were replicated four times in a randomized complete block design. WF nymphs and egg counts were made before foliar applications were initiated and 5 days after treatment (DAT) of every application date. WF eggs and nymphs were counted in a 0.625 sq. in. area on the underside of the third terminal leaf of the cantaloupe vines under a microscope.

Results and Discussion

The number of eggs for all treatments were similar to the untreated check on all rating dates. At 5 DAT of the second application, the number nymphs for the Mycotrol treatments were the highest of all treatments. Following the third application, the number of nymphs for Mycotrol treatments were reduced and similar to the untreated check. There was not a difference between the low and high rate of Mycotrol. Pyriproxyfen without an adjuvant showed slightly less nymphs than when spreader-sticker, Kinetic at 0.125% v/v, was added. Align treated cantaloupes showed higher numbers of nymphs following each application compared to the untreated check.

Final observational notes showed that the quality of the foliar-treated melons vines were not acceptable relative to melon vines treated with higher rates of Admire in an adjacent test. However, the foliar-treated melon vines were of better quality than the foliarly untreated check that only had a low rate of Admire applied at planting time.

Table. Whitefly control with foliar insecticides following imidacloprid in cantaloupes. (Umeda and Fredman).

Treatment	Rate	Mean Number Whitefly / Leaf							
		Eggs				Nymphs			
		15 Sep	25 Sep	02 Oct	09 Oct	15 Sep	25 Sep	02 Oct	09 Oct
Untreated check		24.5	48.5	88.7	37.7	1.2	0.7	5.7	1.6
Mycotrol WP +	0.25 lb prod./A	17.8	90.7	88.3	36.4	1.0	1.6	18.8	1.3
R-56	0.04% v/v								
Mycotrol WP +	0.50 lb prod./A	25.8	99.6	70.2	39.3	1.6	1.0	21.5	3.3
R-56	0.04% v/v								
Pyriproxyfen 0.083 EC	20 gm a.i./A	20.2	63.1	99.2	56.8	1.1	2.5	4.7	0.8
Pyriproxyfen 0.083 EC +	20 gm a.i./A	25.0	61.9	64.1	31.5	0.9	2.0	4.6	2.9
Kinetic	0.125% v/v								
Align EC +	21 oz prod./A	28.1	63.1	76.8	36.4	1.2	2.8	7.7	6.1
Kinetic	0.125% v/v								
LSD (P=0.05)		11.8	51.3	56.3	25.7	1.0	2.5	28.3	6.2

Applications made on 20, 27 Sep, and 04 Oct 1995.