

Evaluation of insecticides for control of European asparagus aphid, 2014

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The loss of disulfoton (Di-Syston) and continued pressure from California's Central Valley Regional Water Quality Control Board to reduce the use of chlorpyrifos have given the hunt for new insecticides for asparagus great urgency. In 2014, a replicated field trial was conducted in an asparagus field located on Roberts Island (37° 53' 24" N 121° 23' 14" W) in the Central Delta region of the Sacramento-San Joaquin Delta. Plots measured 30 ft long by a single row and each insecticide treatment was replicated four times in a randomized complete block design.

Insecticides were applied once on August 24th with a CO²-pressurized backpack sprayer and a hand-held boom operated at a pressure of 34 psi at the boom. A single nozzle was directed over the top of the fern and two nozzles were between the rows and directed horizontally; the rows of fern were sprayed on each side. Water volumes were equivalent to 50 gallons per acre. Each treatment included a non-ionic surfactant at a rate of 0.25% v/v. Aphids were counted at various intervals after the insecticide application: 3 days post-treatment (dpt), 9 dpt, and 15 dpt. At each sampling time point, three spots within each plot were beat three times and aphids were caught on a beating sheet. Aphids were counted when feasible, or when populations were extremely high, the count was estimated by counting a portion of the grid and extrapolating the number out to the entire beating sheet. Aphid populations prior to the application were high, averaging about 273 aphids per three beatings. Although counts varied from fern to fern, in general the aphids were spread fairly evenly throughout the four replicate blocks. After treatment, counts continued to be somewhat variable from fern to fern, but nonetheless some clear conclusions can still be drawn from the data.

Lorsban, Warrior, Closer and Sivanto were the most effective with almost complete control observed at only 3 days post-treatment. Fulfill was slower acting and less effective, and it appeared that aphid populations began to rebound by the 2-week mark. Note that Closer (Dow) and Sivanto (Bayer) are not currently registered for use on asparagus. However, if registered they would provide reduced-risk alternatives to chlorpyrifos. They are also in different chemical groups so they would be useful in an insecticide resistance management program.

Table 1. Efficacy of insecticides against European asparagus aphid in asparagus.

Product (rate per acre)	active ingredient	Number of aphids at days post-treatment (dpt)		
		<i>3 dpt</i>	<i>9 dpt</i>	<i>15 dpt</i>
Nontreated control	none	398	282	683
Fulfill (2.75 oz)	pymetrozine	217	26	126
Closer (2 fl oz)	sulfoxaflor	2	0	0
Closer (1.5 fl oz)	sulfoxaflor	1	0	0
Lorsban Advanced (2 pt)	chlorpyrifos	1	0	0
Sivanto (14 oz)	flupyradifurone	0	0	0
Warrior II (1.92 oz)	lambda-cyhalothrin	0	0	0
Sivanto (10.5 fl oz)	flupyradifurone	0	0	0