

FIELD EFFICACY OF SEVERAL LABELED AND EXPERIMENTAL INSECTICIDES FOR SPOTTED WING DROSOPHILA CONTROL IN BLUEBERRY

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Trials were conducted on the WSU NWREC on 8 year-old 'Duke' blueberries. Four bush, unreplicated plots were randomly selected in four rows. Treatments were applied with a CO₂ backpack sprayer equipped with a 36" boom arranged with 2- 8002VS nozzles centrally spaced 18" apart with 2, 12" drop tubes each equipped with an 8002VS nozzle directed at right angles toward the bush. The boom operated to deliver 100 gal/ac at 40 psi. Seven treatments were SWD insecticides registered for use in WA and three were non-labeled insecticides worthy of IR-4 consideration. All treatments contained methylated seed oil adjuvant at 0.0025 v/v. The treatment was applied to mature leaves on 11 September 2012. Two top canopy leaves were taken from each bush from 1-10 DAT, 13-14 DAT and 28 DAT. The two leaf samples were placed in 100x20 mm Petri dishes with a 0.5" long, moistened cotton dental wick, 5 mm³ of diet media and 5 even-aged SWD adults from our lab colony. Mortality was evaluated after 24 hours. We continue to feel the leaf bioassay is a more accurate technique for assessing commercial efficacy when applying dilute rates of SWD protective sprays by ground equipment to blueberries. Canopy foliage provides larger surface areas for high-pressure sprayer coverage that can mitigate resting and feeding sites for adults between their egg-laying activity. Both field and lab bioassays of treated blueberries reflect the difficulty of achieving good coverage on all surfaces of blueberry fruit clusters that are located within the foliage of a blueberry bush. Contact coverage is critical to the rapid knockdown of egg laying female SWD seeking ripening fruit.

We used a provisional mortality rate of 90% to compare our treatments with each other for daily residual activity that extended to 28 DAT. Field aging residues at 7 DAT showed the pyrethroids Danitol, Mustang Max, Warrior II and combination product Leverage 360 exceeding the threshold, followed by Brigade (87.5%) and Endigo (89.7%) (Tables 1-2). Furthermore, Danitol and Leverage continued high activity levels of 95% and 100% at 14 DAT. When we extended the leaf bioassay to 28 DAT, Leverage, Brigade and Danitol were killing adult SWD above 60% mortality with 24 hour exposures in a Petri dish. Again, we speculate that SWD populations reside for a good portion of a day on foliage and berry surfaces. This observed longevity for pyrethroids on blueberry has been report in the literature for other woody perennial plants such as roses. The incorporation of a MSO surfactant may have provided enhanced residual extension compared with our incorporation of the non-ionic surfactant R-56.

Table 1. Efficacy of SWD insecticides registered for use on blueberry

Treatment	Rate/acre	<u>Percent Mortality</u>			
		1 DAT	3 DAT	7 DAT	14 DAT
Brigade WSB	16 oz	95a	71.7ab	87.5b	74.4bc
Danitol 2.4 EC	16 fl oz	100a	70.4ab	95ab	95a
Mustang Max	4 fl oz	100a	43.8cd	91.4ab	5.6d
Malathion 8	32 fl oz	100a	77.5a	0c	0d
Delegate WG	6 oz	62.5bc	3.6e	0c	0d
Entrust 2 SC	6.4 fl oz	24.1de	5e	0c	0d
Lannate LV	24 fl oz	42.5cd	10e	0c	0d
Untreated check		5e	0e	0c	0d

Mean within columns followed by the same letter are not significantly different (Fisher's Protected LSD, $P < 0.05$), PROC ANOVA SAS.

Table 2. Efficacy of unlabeled insecticides on SWD on blueberry

Treatment	Rate/acre	<u>Percent Mortality</u>			
		1 DAT	3 DAT	7 DAT	14 DAT
Warrior II	1.92 fl oz	95a	50bcd	100a	85ab
Endigo ZC	4.5 fl oz	78.1ab	38.3d	89.7ab	57.1c
Leverage 360	3.2 fl oz	83.9ab	65abc	91.9ab	100a
Untreated check		5e	0e	0c	0d

Mean within columns followed by the same letter are not significantly different (Fisher's Protected LSD, $P < 0.05$), PROC ANOVA SAS.