

**EVALUATION OF SEVERAL LABELED AND EXPERIMENTAL  
INSECTICIDES FOR ROOT WEEVIL CONTROL IN SMALL FRUITS, 2012**

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***Clay color weevil bioassay***

Clay colored weevils (CCW), *Otiorhynchus singularis* (L.) were collected with beat trays from the Northwood area of Lynden from a first year, 'Meeker' planting on 14 May 2012. Contact-topical treatments consisted of Actara™ (thiamethoxam at 3 oz/acre), Brigade 2EC (bifenthrin at 6.4 fl oz/acre), Mustang Max (zeta cypermethrin at 4 fl oz/acre) and unlabeled Avaunt (indoxacarb at 6 oz/acre), Leverage 2.7 (imidacloprid/cyfluthrin at 3.75 fl oz/acre), Voliam flexi (thiamethoxam/chlorantraniliprole at 7 oz/acre), non-registered Cyazypyr 10 SE (cyantraniliprole at 20.5 fl oz/acre + MSO) and an untreated check. Treatment arenas consisted of an individual red raspberry leaflet placed top-side up and a moistened 0.5' long cotton dental sick in a 90 x15 mm Petri dish. Each treatment was replicated 3 times with 5 CCW/dish. These arenas were treated with 1 ml of the recommended field rate for each product in the equivalent rate of 100 gal/acre with a Precision Potter Spray Tower at 15 psi. These arenas were held at lab temperature in trays under semi-dark conditions. Poking individuals assessed adult mortality with a dissecting probe to determine dead, moribund or feigning dead weevils at 24 hour intervals to 4 DAT (Table 1).

Table 1. Clay color weevil residue bioassay on red raspberry foliage, 2012

Treatment	Rate/acre	Percent Mortality		
		1 DAT	2 DAT	4 DAT
Brigade 2 EC	6.4 fl oz	100a		
Mustang Max	4 fl oz	100a		
Actara	3 oz	53.3b	93.3a	93.3a
Avaunt	6 oz	0.0d	80a	80a
Cyazypyr	20.5 fl oz	13.3cd	100a	50b
Leverage 2.7	6.4 fl oz	100a		
Voliam flexi	7 oz	33.3bc	93.3a	93.3a
UTC		0.0d	0.0b	0.0b
Mean within columns followed by the same letter are not significantly different				
(Fisher's Protected LSD, $P < 0.05$ ), PRC ANOVA SAS.				

After 1 day posttreatment, all CCW placed on Brigade, Mustang Max and experimental Leverage treated foliage were dead. The results for the two pyrethroids further support our extension recommendations to apply them as early spring basal applications or as

foliar sprays during bud break and the formation of fruiting laterals. These applications would provide topical and contact/stomach modes of entry to adult feeding CCW. Actara is a slower acting product and performed commensurate with the unlabeled package mix Voliam flexi. Some of the Actara exposed adults scored dead or moribund at 2 DAT recovered on 4 DAT. At 4 DAT, Avaunt provided equivalent level of control with Actara and Voliam flexi as well. Cyazypyr showed significantly lower levels of control and variability between replicates because many of the weevils were scored as moribund or dying. Cyazypyr provides faster knockdown when it is ingested compared with a topically applied treatment. However, one must remember that a topically exposed CCW in the field would be re-exposed to residues on the canes or when they feed on contaminated buds and foliage that should be enough to provide complete mortality. The Czazypyr/Rynaxypyr insecticides represent a unique MOA insecticides (Group 28) that will be supported for an IR-4 residue project in caneberry and possibly strawberry. Also because DuPont has indicated that Cyazypyr does not have MRL issues like Avaunt has with Canada.

### **Black vine weevil bioassay**

Black vine weevil (BVW), *Otiorhynchus sulcatus* (F.) adults were collected from a 3 year-old 'Totem' field in Burlington, WA on 17 July 2012. Treatment arenas consisted of an individually treated red raspberry leaflet placed top-side up in a 90x15 mm Petri dish. Each treatment was replicated 3 times with 5 BVW/dish. A moistened 0.5' long cotton dental wick was placed in the arenas that were held at lab temperature in trays under semi-dark conditions. These arenas were treated with 1 ml of the recommended field rate for each product in the equivalent rate of 100 gal/acre with a Precision Potter Spray Tower at 15 psi. Contact-ingestion treatments consisted of non-registered Cyazypyr 10 SE (cyantraniliprole at 13.5 and 20.5 fl oz//acre + MSO) and an untreated check. By 3 days posttreatment, all of the BVW adults were scored as dead, despite evidence of morbidity and recovery evident after 24 hours of exposure. As observed earlier for the CCW, Cyazypyr continued to shown consistent efficacious activity to adult root weevils common to small fruits. This group 28 new MOA chemistry will provide an excellent rotational partner with Mustang Max and other pyrethroids in small fruit crops.