Report for BC Cranberry Marketing Commission

Project Title: Pesticide Evaluations for controlling Cranberry Tipworm and Dearness Scale;

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Project Summary: Our first objective was to test five pest control products for control of cranberry tipworm. Our second objective was to test four products for the control of Dearness Scale. Populations of both Cranberry Tipworm and Dearness Scale were monitored on two farms in the Lower Fraser Valley. The results suggest that the timing of the treatment application is critical for achieving control of these two pests. Both pests have only one developmental stage that appears most susceptible to the pest control products currently available. Previous trials with some of these products have not given adequate control, possibly because of the timing of the treatments with respect to the life stages of the pests.

We tested three new products for controlling cranberry tipworm and two that have tipworm on their label. For Dearness Scale we tested three products against the standard registered product. We identified one new product that has good control potential for cranberry tipworm, as well as confirming the two registered products give equivalent control as per the label. All products were tested as a chemigation equivalent except for the Delegate treatment. For Dearness Scale the product that gave us the best control may not be suitable due to issues with pollinators. We currently have no replacements for diazinon to control Dearness Scale when diazinon is removed from the market in 2016.

Cranberry Tipworm Control

Objective 1 methodology -: All pesticide treatments were used at label rates and applied in an equivalent to chemigation protocol, where an equivalent to a 15 minute wash off volume of water is applied over the chemical application. The Delegate treatment, however, was applied as a ground spray as per the label directions. Four replicates of each treatment were applied using a CO2 pressurized sprayer at 40 psi. All treatments were applied July 2, 2014. Three samples of upright and runner tips were collected from each replicate plot immediately before the treatments were applied and again at 5 days after application. Ten tips from each sample were examined and the number of eggs, larva (three stages) and pupae were recorded using a microscope.

Results:

Delegate is a registered product that was applied as a spray application rather than as a chemigation application. All applications were applied when the egg count was at a peak and first stage larvae (L1) counts were increasing. Delegate, Movento, Closer and Altacor all reduced first and second stage larva counts. Delegate and Movento were the only treatments that reduced the 3rd stage larva (L3) counts. None of the treatments reduced the count of pupae. (The results of the statistical analysis for the cranberry tipworm trial were not available at the time of writing to meet the submission deadline)

		5-DAT COUNTS				
	rate	**Mean eggs**	**Mean L1**	**Mean L2**	**Mean L3**	**Mean Pupa**
UT		9.25	25.75	17.75	6	8.75
DELEGATE	420g/Ha	6.25	7.75	0.5	1.75	9.75
CLOSER	150mL/Ha	5	14.25	4	4.5	5
ALTACOR	285g/Ha	10.25	2 b	3	4	4.25
SIVANTO	378mL/Ha	6.25	16.25	13	9	8
MOVENTO	730mL/Ha	8.75	0.25	0	0.5	2.25

Cranberry tipworm counts at 5 days after treatment

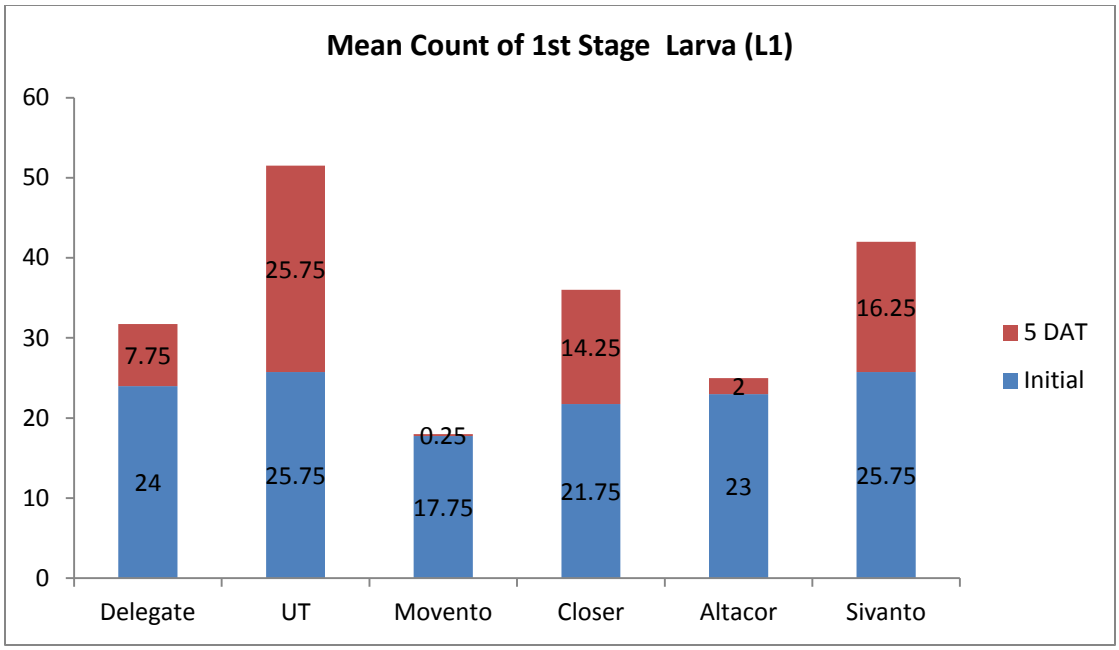

Figure 1. Initial counts for first stage larvae (L1) of cranberry tipworm and counts 5 days after treatments.

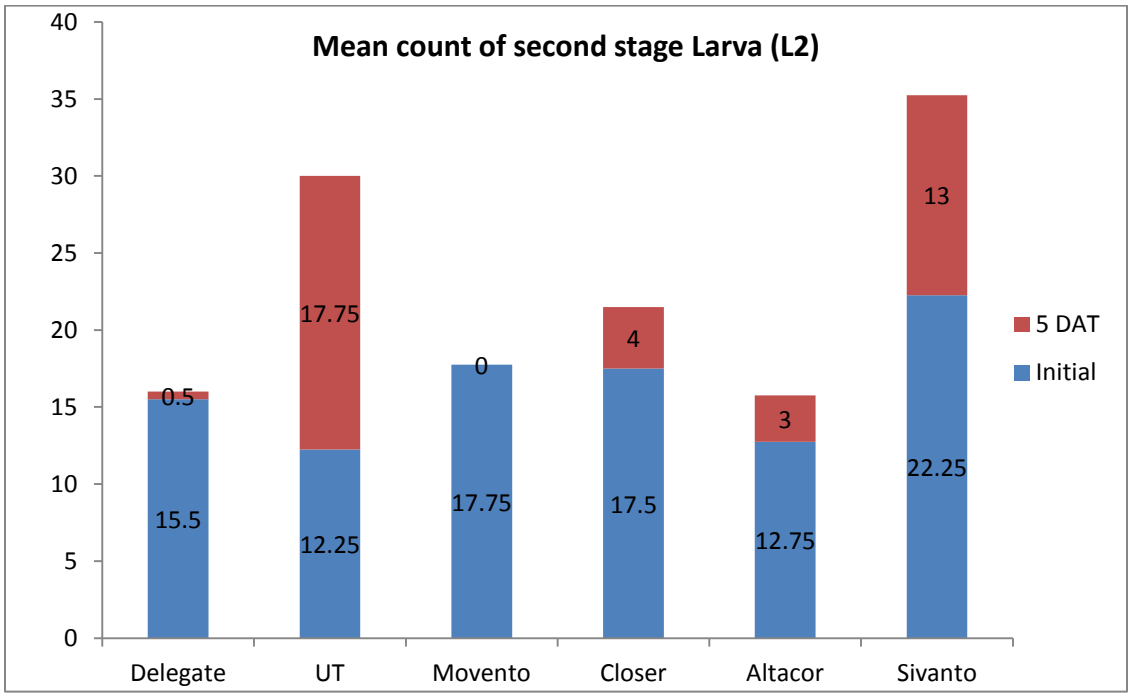

Figure 2. Initial counts of second stage larvae (L2) of cranberry tipworm and counts 5 days after treatments.

Discussion: When applications were timed to coincide with high L1 populations it appears that Altacor can give effective control of a first and second stage cranberry tipworm larvae. The Delegate ground spray and Altacor treatments for cranberry tipworm reduced first and second stage larvae. A label expansion is required before Altacor could be recommended for cranberry tipworm control. Of the two new products Closer gave some control of L2 stage of tipworm, while Sivanto did not give control on any of the life stages counted. Movento continues to be effective for controlling larval stages of cranberry tipworm. One application per growing season of one of these effective treatments would not be adequate to control cranberry tipworm to a level that bud set was not hindered.

Dearness Scale Control

Objective 2 methodologies:

A dry picked bed harvested for fresh fruit with historically high counts of Dearness Scale was monitored twice per week beginning May 13 for emergence of crawlers from the egg sacs. Three products were tested against the standard registered treatment. All pesticide treatments were used at label rates and applied in an equivalent to chemigation protocol, where an equivalent to a 15 minute wash off volume of water is applied over the chemical application. The first application of treatments was timed when the first significant emergence of crawlers occurred. Two applications were applied, the first, two days after a major emergence on May 29 and the second 10 days later. When crawlers had ceased to emerge in untreated areas, 26 days after the first application, uprights were collected and the numbers of new scales present were counted.

Treatment	formulation	Rate per hectare	Rate Unit	Application code	Average New Scales
Untreated					30.38 a
Closer	240g/L	150	milliliters	A+B	23.05 ac
Sivanto	200 g/L	153.8	milliliters	A+B	25.73 ac
Movento	240g/L	730	milliliters	A+B	16.48 bc
Diazinon	500g/L	4.94	liters	A+B	10.47 b

Table 1. New scales counts

(Average new scale counts with the same letter are not significantly different at P<.05, Tukey's Test)

Discussion:

Both Closer and Sivanto had no significant effect on reducing the count of new Dearness Scale scales on cranberry uprights after two applications. The results indicate that Movento and Diazinon reduced the number of new Dearness Scales when applied as a chemigation equivalent. This remains a significant pest for fresh fruit growers. Dearness Scale is widespread in wet pick cranberry beds as well, but only occasionally causes serious problems in those beds. Previous years trials have not identified any other products already registered that would give control of Dearness Scale. Because we have no registered replacement for diazinon this is of concern to cranberry growers. Currently the Movento registration calls for post bloom applications. The crawler stage of Dearness scale is the target stage for control and this stage has completed emergence before the end of cranberry bloom in British Columbia. Until it is acceptable for use during bloom this product may not be available for a minor use label expansion.