Pome Fruits—Chemical Control

Timing of Chemical Applications for Control of *Campylomma verbasci* Meyer on Red Delicious

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Until recently campylomma has been a sporadic pest in Washington State. Now it is relatively widespread. Control of this pest has been rather hit and miss. Some growers who did not notice campylomma until late in the spring would spray and still have unacceptable damage levels. This suggested that timing of chemical applications may be very important. In this experiment we examined the effect of timing on the degree of campylomma control. Lorsban was chosen because it is known to be effective against campylomma and has other potential uses during prebloom (leafrollers).

Two different tests were conducted, each in a different orchard. The test 1 orchard contained 'Red Delicious' >2 m tall; test 2 contained 'Red Delicious' <2.5 m tall. The experimental design was randomized complete block in both orchards. Test 1 had 6 treatments and 4 replications (3 trees per replicate); test 2 had 4 single tree replicates per treatment and 10 treatments. Treatments in both tests were applied to the point of drip with a handgun sprayer operated at 240 psi. Per acre application rates were based on a 400 gal/acre solution. Nymphs were sampled by limb-tap onto a 45 cm x 45 cm (18 inch x 18 inch), black cloth tray. In both tests 1 tap per tree was made (3 taps per replicate in test 1). Fruit evaluation was conducted after hand thinning in test 1, before hand thinning in test 2 and before fruit harvest in both tests. Forty apples per tree (or every apple on trees with fewer than 40 apples) were examined at both evaluation times for both tests. Fruit with one sting or more were considered culls.

In test 1, nymph populations and damage were moderate (Table 1). Post-treatment nymph densities were significantly lower than controls for most sampling dates. All pesticide treated blocks had significantly less damage at preharvest than the untreated control. The full bloom Carzol application was the only treatment, other than the control, to have greater than 1% damage (1.46%) (Table 1). However, damage in the full bloom Carzol treatment was not significantly different from the Lorsban treatments (Table 1). In test 2, nymph populations were high and damage was moderate (Table 2). With the exception of the Sevin XLR Plus treatment, post-treatment nymph densities were significantly lower than controls for most sampling dates (Table 2). Damage levels in the Sevin and M-Pede (two application) treatments were not significantly different than the control. Lorsban and Thiodan applied at pink and Carzol applied at full bloom provided the best control (Table 2). M-Pede (three applications—pink, full bloom and petal fall) and 50% field rate Carzol at pink treatments also provided very good control while the 100% field rate Carzol at pink and Diazinon at pink treatments provided adequate control (Table 2).

Table 1. 1992 campylomma control, Lorsban timing comparison.

Test 1 Treatment	Rate/ acre	Timing* (Date applied)	Campylomma/tap by date								% culled fruit	
			1 Apr	7 Apr	15 Apr	22 Apr	30 Apr	7 May	13 May	20 May	16 Jun	6 Sep
Lorsban 4E + oil	3 pt	HIG (21 Mar)	0.00a	0.00b	0.17b	0.67b	1.67bc	1.67bc	0.42bc	1.00bc	2.08bc	0.83b
Lorsban 50W	3 lb	HIG (21 Mar)	0.00a	0.00b	0.67b	1.33b	3.58ab	2.42b	1.67b	1.83ab	3.13b	0.62b
Lorsban 50W	3 lb	TC (30 Mar)	0.00a	0.00b	0.17b	0.17b	0.92c	1.67bc	0.42bc	0.75c	1.46bc	0.42b
Lorsban 50W	3 lb	PK (3 Apr)	0.17a	0.00b	0.08b	0.33b	0.92c	1.08bc	0.08c	0.25c	1.04c	0.83b
Carzol 92SP	1 lb	FB (13 Apr)	0.17a	0.58a	0.33b	0.25b	0.08c	0.08c	0.08c	0.25c	1.46bc	1.46b
Untreated control			0.08a	0.83a	1.42a	4.29a	4.83a	4.42a	3.33a	2.08a	8.54a	5.62a

Means within columns followed by the same letter are not significantly different (P<0.05; Waller-Duncan *k*-ratio *t*-test, *k*-ratio=100).
*HIG (half inch green), PK (pink), TC (tight cluster) and FB (full bloom).

Table 2. 1992 campylomma control, chemical application comparison.

Test 1 Treatment	Rate/ acre	Timing* (Date applied)	Campylomma/tap by date								% culled fruit	
			3 Apr	8 Apr	15 Apr	22 Apr	30 Apr	7 May	13 May	21 May	17 Jun	4 Sep
Sevin XLR Plus	1 qt	4 Apr	3.75a	0.25b	0.50ab	5.00a	3.50a	5.25ab	3.25b	2.50ab	6.25bc	7.64a
M-Pede	1%	4, 13 Apr	2.50a	1.25b	0.00b	1.25b	2.75ab	2.75bc	3.00b	1.50ab	8.13b	6.45a
M-Pede	1%	4, 13, 23 Apr	2.25a	0.75b	0.50ab	3.25ab	0.25c	0.25c	1.75bc	0.25b	3.13bcd	0.63b
Lorsban 50W	3 lb	5 Apr	2.50a	0.00b	0.00b	0.00b	0.25c	0.00c	0.00c	1.00ab	0.00d	0.00b
Carzol 92SP	1 lb	5 Apr	2.75a	0.50b	0.25b	0.50b	0.50c	0.00c	0.25c	0.75ab	0.63d	1.27b
Carzol 92SP	1 lb	13 Apr	3.00a	7.25a	0.00b	0.00b	0.00c	0.00c	0.00c	0.75ab	5.00bcd	0.00b
Carzol 92SP	0.5 lb	5 Apr	3.75a	1.00b	0.25b	1.00b	0.00c	0.00c	0.00c	1.00ab	3.75bcd	0.63b
Diazinon 50W	4 lb	5 Apr	2.50a	0.00b	0.00b	0.75b	1.25bc	2.00bc	1.00bc	0.75ab	3.13bcd	1.25b
Thiodan 50WP	3 lb	5 Apr	3.25a	0.00b	0.00b	0.00b	0.25c	1.00c	0.25c	0.75ab	1.25cd	0.00b
Untreated control			3.00a	2.00ab	1.75a	5.50a	4.75a	7.50a	8.75a	3.25a	13.75a	6.87a

Means within columns followed by the same letter are not significantly different (P<0.05; Waller-Duncan *k*-ratio *t*-test, *k*-ratio=100).

Trade name	Common name	Chemical name
Carzol 92SP	Carzol	
Diazinon 50W	Diazinon	
Sevin XLR Plus	Sevin	Carbaryl
M-Pede	Insecticidal soap	
Lorsban	Lorsban	Chlorpyrifos
Thiodan 50WP	Thiodan	