

Pome Fruits—Chemical Control

*Aphis pomi* and *Aphis spiraecola* on Apple

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**Materials and Methods**

The experiment was done in a commercial orchard near Chelan Falls in a block of young 'Golden Delicious' just beginning to bear fruit. Trees were about 2 m tall. At the time the pre-treatment count was taken (15 July), 5 vigorously growing and aphid-infested terminal shoots per tree were tagged. The number of aphid-infested leaves per terminal (one or more aphids per leaf) and the number of aphids per most infested leaf were recorded. All natural enemies encountered on the tagged shoots were also recorded (by individual species). Treatments were applied with a handgun sprayer operated at ca. 150 psi. Trees were sprayed to the point of drip. M-Pede alone (8 gal and 4 gal/acre), M-Pede plus Thiodan (2 and 3lb/acre) and Thiodan alone at 3 lb/acre were applied on 16 July; all other treatments were applied on 21 July due to poor weather.

Fruit evaluations were done on a small-scale commercial packing line (Aweta Co., The Netherlands). All fruit on the tree were picked and were held in refrigerated storage until run over the packing line. The lots of fruit were put through the washer/brusher, dried, and then graded by size and color. A computer-controlled program kept track of the numbers of fruits in each weight and color category. Fruits were then visually inspected for evidence of aphid damage (sooty mold in the stem end). All aphid-damaged fruits were weighed individually and their color class recorded.

**Aphid control.** Essentially, all treatments except Pyrellin (alone) and M-Pede (4 gal/acre) reduced aphid populations in comparison to the check (Table 9310b.1). Pyrellin alone had no appreciable effect, whereas M-Pede reduced aphid populations considerably. Interestingly, the combination of Pyrellin plus M-Pede was not significantly different than the best treatments on 26 July (NTN-33893 and Phosphamidon). Both combinations of M-Pede plus Thiodan gave good results in this trial, although Thiodan alone gave quite adequate control. Thiodan's strong performance is somewhat unexpected, since results from other tests have shown varying degrees of resistance to this compound.

**Natural Enemy Toxicity.** The primary natural enemy found in the plot was *Campylomma verbasci*, a mirid bug. This species comprised from 40-60% of all the predators present. Lacewings (primarily larvae) were the next most abundant species, followed by syrphids. Lady beetles comprised only a small portion of the population. Other predators included cecidomyiid larvae and *Deraeocoris* nymphs. The abundance of natural enemies declined during the course of the experiment, although this was not apparently related to insecticide treatment (data not shown).

**Fruit damage.** The primary type of fruit damage found was russetting (Table 9310b.2). This is a common cause of cullage for this cultivar and may have a number of causes. This makes interpretation of russetting data difficult; however, since no differences occurred between treatment means, it can be inferred that neither the pesticide used nor the aphid honeydew influenced the amount of russetting. Direct evidence of fruit damage (sooty mold in the stem cavity) was very low overall, occurring only in the check (ca. 2%). This occurred despite initially very high aphid numbers and significant honeydew production. Although the circumstances that lend themselves toward low vs. high levels of fruit damage for a given aphid population require further explanation, clearly not all high aphid populations, even on a sensitive cultivar, will produce fruit damage.

**Table 9310b.1.** Treatment means of aphid populations, Beebe orchard, 1993.

Treatment	Rate/acre	Aphids per most infested leaf			
		15 Jul	26 Jul <sup>z</sup>	2 Aug <sup>z</sup>	9 Aug
M-Pede 4EC	8 gal	254.70a	24.40bcde	19.05bc	0a
M-Pede 4EC	4 gal	308.25a	61.70abc	10.03bcde	0a
M-Pede 4EC	4 gal	289.45a	0.25f	0.00e	0a
+ Thiodan 50W	2 lb				
M-Pede	4 gal	311.76a	0.55f	0.05de	0a
+ Thiodan 50W	3 lb				
Thiodan 50W	3 lb	214.63a	6.70ef	2.65cde	0a
Pyrellin 0.112EC	2 pt	308.70a	146.80a	75.00a	0a
Pyrellin 0.112EC	2 pt	281.15a	11.60def	0.45cde	0a
+ M-Pede 4EC	4 gal				
Guthion 35WP	2.86 lb	253.45a	24.05def	19.05bcd	0a
+ M-Pede 4EC	4 gal				
+ Sunspray Oil	4 gal				
Phosphamidon 8E	1 pt	246.55a	0.10f	2.70cde	0a
Untreated check	--	242.78a	138.10ab	64.25ab	0a
NTN 33893 2F	6.4 fl oz	224.85a	0.15f	0.05de	0a
+ Kinetic	4 pt				
CGA 215944 25WP	2.67 lb	334.65a	17.40cde	0.00e	0a
CGA 215944 25WP	4.005 lb	259.50a	28.10bcd	0.20de	0a

<sup>z</sup>Data transformed  $x=\log(x+1)$  prior to analysis due to unequal variances (Levene's Test). Means within columns followed by the same letter are not significantly different (Waller-Duncan *k*-ratio *t*-test, *k*-ratio=100).

**Table 9310b.2.** Fruit damage associated with aphids, Beebe orchard, 1993.

Treatment	Rate/acre	No. reps nonmissing	% fruit russetted	% fruit sooty mold
M-Pede 4EC	8 gal	4	15.91a	0a
M-Pede 4EC	4 gal	3	7.25a	0a
M-Pede 4EC + Thiodan 50W	4 gal 2 lb	4	15.53a	0a
M-Pede 4EC + Thiodan 50W	4 gal 3 lb	4	22.58a	0a
Thiodan 50W	3 lb	4	26.93a	0a
Pyrellin 0.112EC	2 pt	4	14.18a	0a
Pyrellin 0.112EC + M-Pede 4EC	2 pt 4 gal	4	34.18a	0a
Guthion 35WP + M-Pede 4EC + Sunspray Oil	2.86 lb 4 gal 4 gal	4	28.35a	0a
Phosphamidon 8E	1 pt	4	6.75a	0a
Untreated check	--	4	11.67a	2.08a
NTN 33893 2F + Kinetic	6.4 fl oz 4 pt	3	18.17a	0a
CGA 215944 25WP	2.7 lb	3	15.00a	0a
CGA 215944 25WP	4 lb	2	3.45a	0a