Pome Fruits—Chemical Control

Aphis pomi and *Aphis spiraecola* on Apple, Test of Registered Aphicides, 1993

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Interest in aphid management has increased considerably in the past few years. *Aphis pomi* and *Aphis spiraecola* are chronic pests of apple in Washington. Up until a few years ago, management was relatively straightforward: an aphicide was added to a cover spray 1-2 times/season whenever aphids became numerous. According to a survey of bearing apples during the 1989 growing season, aphids were targeted in 2.4 sprays/season on 84% of the acreage. This makes aphids the second most sprayed-for insect after codling moth.

Materials and Methods

The experiment was done in a commercial orchard near Chelan (Chelan Co.), Washington. The block was composed of standard 'Delicious' trees over 4 m tall. At least one buffer tree (within rows) was kept between trees used in the experiment to prevent contamination from drift. At the time the pre-treatment count was taken (24 June), 10 vigorously growing and aphid-infested terminal shoots per tree were tagged (4 replicate trees/treatment). 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). The exception to this was the pre-treatment count, where a rating scale (0 to 3) was used instead of counting the aphids per most infested leaf. Treatments were applied with a handgun sprayer operated at ca. 360 psi. Trees were sprayed to the point of drip on 28 June. The second and third applications of the triple application of M-Pede were applied 9 and 16 July.

Fruit evaluations were done on a small-scale commercial packing line (Aweta Co., The Netherlands). The fruit were picked loose into a cardboard packing box, with a sample size of up to 1 box/tree. Fruit were held in refrigerated storage until run over the packing line. The 1-box 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 fruit were weighed individually and their color class recorded.

Aphid control. Phosphamidon gave results inconsistent with past trials. M-Pede + Thiodan 3 lb, dimethoate, and Asana performed fairly well, although means in the dimethoate treatments were higher than the checks late in the season. M-Pede plus 2 lb of Thiodan and M-Pede alone (8 gal/acre) allowed overall higher aphid populations (Table 9310a.1).

Natural enemy toxicity. Initial species composition of natural enemies was about 40% each syrphids and lacewings and 15% campylomma. The former two declined over time, and by

the end of the experiment campylomma comprised ca. 93% of the natural enemies present. There were no clear trends in toxicity of materials to natural enemies (data not shown). There appeared to be survival of many species regardless of the material sprayed.

Fruit damage. No russet was found on the apples (Table 9310a.2), which was expected of this non-russet susceptible cultivar. However, some sooty mold occurred in several of the treatments. Only the damage occurring in the Phosphamidon treatment was significantly higher than the other treatments, in this case, including the check. This is the opposite of what might be expected, since Phosphamidon did a reasonable job of aphid control. It is likely that this difference is due to random error rather than any failure of the material. Overall, fruit damage from sooty mold was very low.

Table 9310a.1. Treatment means of aphid populations, Naumes office block, 1993.

		No. aphids/most infested leaf						
Treatment	Rate/ acre	24 Jun[x]	2 Jul	9 Jul	19 Jul	23 Jul	30 Jul	9 Aug
M-Pede 4EC	8 gal	1.58a	31.79ab	55.88a	40.90a	21.15a	6.10a	0.00a
M-Pede 4EC	4 gal	1.68a	51.20bc	27.86abc	25.58a	10.95a	1.84a	0.03a
M-Pede 4EC + Thiodan 50W	4 gal 2 lb	1.90a	20.00cd	32.13abc	46.05a	30.85a	20.48a	0.00a
M-Pede 4EC + Thiodan 50W	4 gal 3 lb	1.63a	6.40e	9.58c	24.93a	21.60a	1.63a	0.00a
Thiodan 50W	3 lb	1.63a	12.13de	13.85bc	23.38a	11.58a	2.28a	0.00a
M-Pede 4EC (triple)	2 gal	1.55a	28.25bc	41.36ab	26.06a	11.09a	9.97a	0.00a
Asana XL 0.66EC	2 fl oz	1.95a	12.55de	20.88bc	25.58a	10.83a	1.95a	0.00a
Dimethoate 2.67EC	4 pt	1.68a	11.78de	15.35bc	29.29a	31.04a	25.39a	0.00a
Phosphamidon 8E	1 pt	1.75a	0.75f	7.95c	28.73a	11.10a	4.80a	0.00a
Untreated check	--	1.78a	69.33a	49.65a	37.98a	16.93a	3.93a	0.03a

Table 9310a.2. Treatment means of fruit damage, Naumes orchard, 1993.

Treatment/acre	Rate/acre	No. replications	% russet	% sooty mold[z]
M-Pede 4EC	8 gal	4	0a	0.26b
M-Pede 4EC	4 gal	4	0a	1.02b
M-Pede 4EC + Thiodan 50W	4 gal 2 lb	4	0a	0.00b
M-Pede + Thiodan 50W	4 gal 3 lb	4	0a	0.00b
Thiodan 50W	3 lb	4	0a	0.00b
M-Pede 4EC (triple)	2 gal	4	0a	0.00b
Asana XL 0.66EC	2 fl oz	4	0a	0.27b
Dimethoate 2.67EC	4 pt	4	0a	0.00b
Phosphamidon 8E	1 pt	4	0a	3.44a
Untreated check	--	4	0a	0.84b

[z]Data transformed arcsine √(y/100) due to non-homogenous variances as determined by Levene's test. Means within columns followed by the same letter are not significantly different (Waller-Duncan *k*-ratio *t*-test, *k*-ratio=100).