Chemical Control/New Products

WOOLLY APPLE APHID CONTROL

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Abstract: The efficacy of Actara and several other widely used insecticides against woolly apple aphid was tested in a 'Pink Lady' apple block near West Richland, WA. Four replicates consisting of 20 trees each were sprayed using an airblast sprayer at 100 gpa on 25 July. Counts of live aphids per colony were done both before application as well as at 6 and 21 d post-treatment. The evaluation done 1 wk after treatment showed a marked mortality in those colonies treated with Thiodan and Diazinon. The other materials (Actara, Dimethoate, Provado and Aza-Direct) all showed a significant decrease in populations when compared to the control, but not to the extent of the Thiodan and Diazinon treated trees. Two weeks later, all above-ground colony size was greatly reduced and not significantly different from the control.

Introduction

The removal of several organophosphate insecticides from the market has greatly decreased the number of insecticides available for woolly apple aphid control. Both Penncap-M and Lorsban were considered the best materials; the former has been removed from the tree fruit market entirely, and the latter may only be used prebloom, an unsuitable timing for woolly aphid control (typically midsummer). For this reason, we re-tested the other materials that were recommended in EB 0419 (Thiodan, Diazinon, and Dimethoate), because confidence in these materials was not high. Provado is now considered the standard material for green aphids, but its efficacy against woolly apple aphid is uncertain. In addition, we tested two new materials, Actara (a chloronicotinyl with activity against other aphid species) and Aza-Direct, a neem (azadirachtin) insecticide.

Materials and Methods

This experiment was conducted in a 'Pink Lady' apple block (Block 6) of Badger Mountain Orchards, near West Richland, WA. The experimental design was a randomized complete block with 8 treatments and 4 replicates. Each replicate was the linear row distance between two trellis poles and consisted of approximately 20 trees. Five well-developed shoot colonies of woolly apple aphid were tagged in each plot. Each colony was examined with a 10× OptiVisor (Donegan Optical Co.) and the number of live aphids (mature and immature) was counted. The treatments were applied on 24 Jul using a multiple tank airblast sprayer (Rears Pak-Blast, Rears Sprayers, Eugene, OR) calibrated to deliver 100 gpa. Treatments were randomized on the basis of the pre-treatment count of 13 July 2001.

Data were analyzed using the Statistical Analysis System (SAS 1988). Data were tested prior to analysis for homogeneity of variance using Levene's (1960) test. Variances found to be non-homogeneous were transformed [ln(y+0.5)] before analysis. PROC GLM was used to conduct an analysis of variance, and treatment means were separated using the Waller-Duncan *k*-ratio *t*-test.

Results and Discussion

The block had a long-term root infestation which provided inoculum for aerial colonies annually. Woolly apple aphid populations in this block had been growing over the summer in terms of both colony size and frequency. The best indication of the activity of the materials applied against woolly apple aphid can be seen in the sample of 31 July. At this time, the population in the check was still rising and whatever the factor eventually causing the decline in numbers noted two weeks later had not yet become operative. The highest rates of mortality in this sample were caused by Thiodan and Diazinon. The other materials caused a significant decrease in populations when compared to the control, but not to the extent of the first two materials. Two weeks later, all shoot colony counts were distinctly smaller and not significantly different from the control (Table 0118.1, Figure 0118.1). The reason for the decline is not known, and although no substantial natural enemy populations were noted, this cannot be ruled out.

References Cited

Levene, H. 1960. Robust tests for equality of variances. Chap. 25. *In* Olkin, I., S. G. Ghurye, W. Hoeffding, W. G. Madow and H. B. Mann (Eds.), Contributions to probability and statistics. Stanford University Press, Stanford, CA.

Statistical Analysis Institute. 1988. SAS/Stat User's Guide, Release 6.03 Edition. SAS Institute, Inc., Cary, NC.

Table 0118.1. Woolly apple aphid shoot colonies, Badger Mountain Blk. 6, West Richland, 2001

Treatment	Rate fm/ acre	Live aphids/colony 13-Jul	31-Jul	14-Aug
Actara 25WGD	2.75 oz	46.9 a	27.6 b	4.8 a
Actara 25WGD	5.50 oz	36.0 a	21.1 bc	4.1 a
Thiodan 50WP	4 lbs	48.3 a	3.1 c	4.8 a
Diazinon 50WP	4 lbs	31.9 a	1.4 c	0.0 a
Dimethoate 4E + Sylgard	16 fl oz 1 pt/100	51.4 a	9.2 bc	12.3 a
Provado 1.6F + Orchex 796	8 fl oz 1%	49.0 a	12.0 bc	3.2 a
Aza-Direct 1.2%	32 fl oz	33.8 a	16.9 bc	2.5 a
Check	. .	47.8 a	67.5 a	8.6 a

Means within columns not followed by the same letter are significantly different (Waller-Duncan *k*-ratio *t*-test, *k*-ratio=100).
Treatments applied 25 Jul 2001.

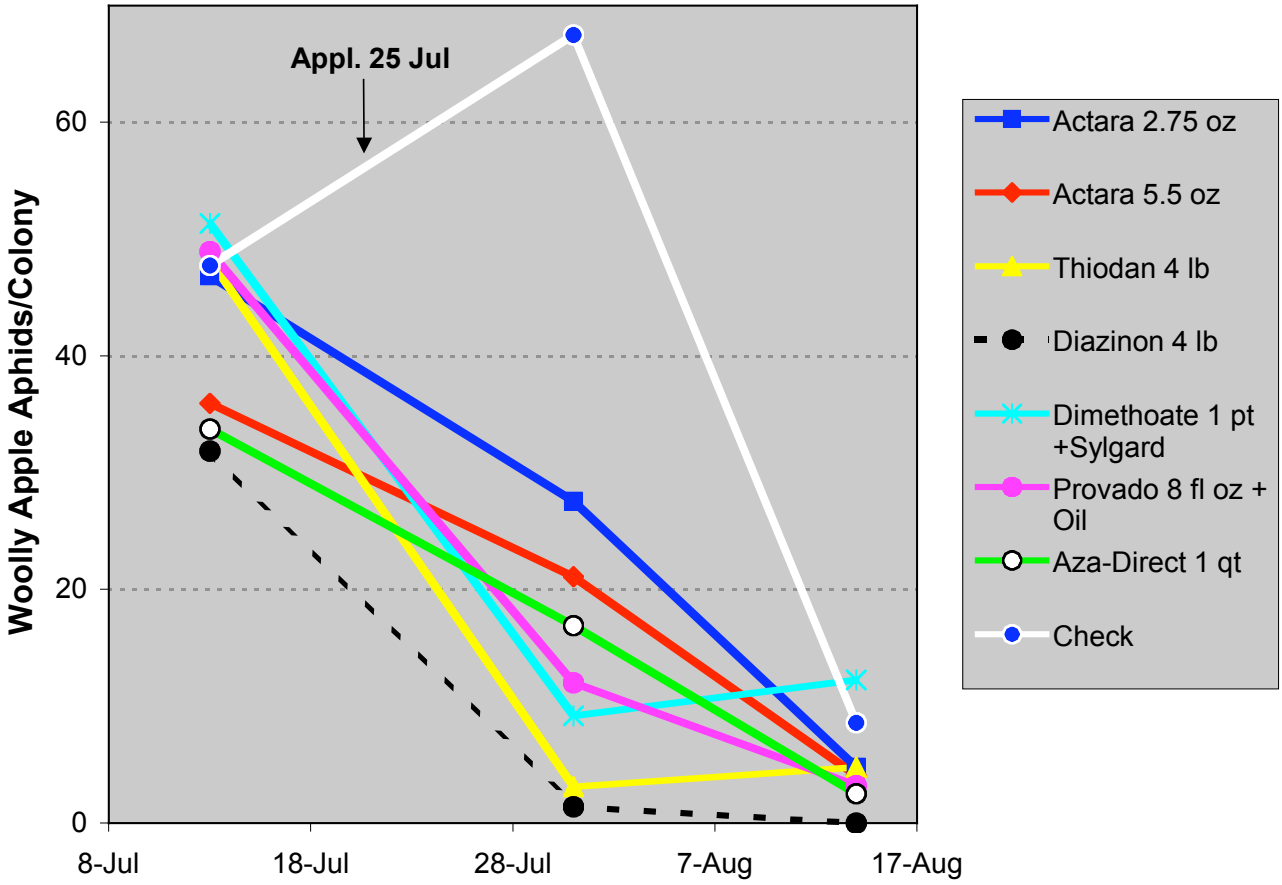

Figure 0118.1. Woolly apple aphids per colony.