APPLE: *Malus domestica* Borkhausen, 'Empire', 'Delicious'

CONTROL OF WOOLLY APPLE APHID, 2002

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Woolly apple aphid (WAA): *Eriosoma lanigerum* (Hausmann)

Two trials were conducted in 2002 to determine the efficacy of various insecticides for control of WAA. The first trial was a laboratory bioassay conducted on WAA infested shoots, and the second trial was an 'on-farm' test conducted in a commercial apple orchard.

**Laboratory Bioassay.**  
'Empire' apple shoots infested with WAA colonies were collected from a commercial orchard on 25 Jul and the cut end of the shoots inserted into floral foam to maintain freshness. A single application of the test materials was made on 26 Jul with a hand-held mist applicator to the point of run-off, as indicated in the tables. The test was replicated 10 times, and shoots were maintained at ambient temperatures for the duration of the trial. Percent mortality was assessed 6 DAT on 1 Aug by visually estimating the percentage of dead aphids per shoot.

**On-Farm Efficacy Trial.**  
Insecticides were applied to mature 'Empire' and 'Red Delicious' apple trees at the Joe Rasch Farm located in Sparta, MI with an airblast sprayer calibrated to deliver 100 gpa. Ten-acre plots were arranged in a non-randomized block design with one replication, and tree spacing was 14 x 18 ft. A regular pesticide maintenance program was applied separately to all treatments. A single application of test materials was made on 27 Jul after WAA populations had become well established. A pre-application count of infested shoots was conducted on 23 Jul by inspecting 200 shoots per treatment. Four subsamples per treatment were inspected post-application on 6 Aug (10 DAT) by inspecting 25 infested shoots per subsample, for a total of 100 shoots per treatment. The percentage of mortality was rated using the following scale: 1 = 0-25%; 2 = 26-50%; 3 = 51-75%; and 4 = 76-100%. Data are presented as the mean percentage of mortality per treatment, and were analyzed using ANOVA and mean separation by LSD at \( P < 0.05 \).

All treatments in the laboratory bioassay (Table 1) provided significant levels of WAA control compared to the untreated check. The data clearly show that Provado, Actara, and Thiodan are all highly lethal to WAA, and Sevin and AzaDirect are moderately lethal. The moderate level of mortality given by Provado in the on-farm trial (Table 2) suggests that 100 gpa may not have given sufficient canopy penetration to provide the highest levels of control. Thiodan, on the other hand, performed very well even with less than dilute spray coverage. Sevin and AzaDirect also appeared to maintain their moderate performance levels under these field conditions.
Table 1.

<table>
<thead>
<tr>
<th>Treatment/formulation</th>
<th>Amt form/acre</th>
<th>08 Aug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated check</td>
<td>---</td>
<td>3.34c</td>
</tr>
<tr>
<td>Sevin 80S</td>
<td>1.25 lb</td>
<td>47.8b</td>
</tr>
<tr>
<td>Provado 1.6F</td>
<td>8 oz</td>
<td>100a</td>
</tr>
<tr>
<td>AzaDirect</td>
<td>32 oz</td>
<td>48.63b</td>
</tr>
<tr>
<td>Thiodan 50WP</td>
<td>5 lb</td>
<td>100a</td>
</tr>
<tr>
<td>Actara 25WG</td>
<td>4.5 oz</td>
<td>100a</td>
</tr>
</tbody>
</table>

Means followed by same letter do not significantly differ ($P < 0.05$, LSD).

Table 2.

<table>
<thead>
<tr>
<th>Treatment/formulation</th>
<th>Amt form/acre</th>
<th>Application timing</th>
<th>06 Aug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sevin 80S</td>
<td>1.25 lb</td>
<td>27 Jul</td>
<td>41.5b</td>
</tr>
<tr>
<td>Provado 1.6F</td>
<td>8 oz</td>
<td>27 Jul</td>
<td>58.5ab</td>
</tr>
<tr>
<td>AzaDirect</td>
<td>32 oz</td>
<td>27 Jul</td>
<td>53.5ab</td>
</tr>
<tr>
<td>Thiodan 50WP</td>
<td>5 lb</td>
<td>27 Jul</td>
<td>82a</td>
</tr>
</tbody>
</table>

Means followed by same letter do not significantly differ ($P < 0.05$, LSD).