APPLE: Malus domestica Borkhausen, ‘Red Delicious’

CONTROL OF SAN JOSE SCALE, 2008

John C. Wise
Department of Entomology
Michigan State University
East Lansing, MI 48824-1115
(517) 432-2668 tel
(517) 353-5598 fax
E-mail: wisejohn@msu.edu

Ryan Vander Poppen
E-mail: vanderp6@msu.edu

Larry J. Gut
E-mail: gut@msu.edu

Potato leafhopper (PLH): Empoasca fabae (Harris)
Rosy apple aphid (RAA): Dysaphis plantaginea (Passerini)
San Jose scale (SJS): Quadraspidiotus pericicous (Comstock)

The purpose of this trial was to compare the performance of various insecticides for control of San Jose scale. Insecticides were applied to 35-yr-old ‘Red Delicious’ apple trees at the Trevor Nichols Research Complex in Fennville, MI (Red Block) with an FMC 1029 tractor-mounted airblast sprayer calibrated to deliver 100 gpa at 2.5 mph. Two-tree plots were arranged in a RCB design with four replications. Tree spacing was 14 × 20 ft, with a minimum of one buffer tree and one buffer row separating all plots. Regular maintenance foliar applications were applied to all treatments and included the fungicides Vangard, Manzate, and Flint. Sevin XLR was sprayed as an apple thinning agent. Solicam, Gramoxone, Weedar and Princep were banded below the trees for weed control. Treatments were applied on 4 May (Pink), 21 May (PF), 4 Jun (1C), 20 Jun (2C) and 16 Jul (Late). On 13 Jun a 2-min search was conducted to determine percentage terminal infestation of RAA. An evaluation of PLH nymphs was done on 24 Jun by counting nymphs on 25 actively growing terminals. SJS were evaluated on 18 Sep by recording damage on 50 fruits/replicate near harvest. Data were analyzed using ANOVA and means separation by LSD at $P = 0.05$. While actual counts are presented, ANOVA was run on transformed data.

All treatments except Diazinon and the late timing of Movento (applied without an adjuvant), significantly reduced the incidence of SJS on fruit at harvest. Only Movento/Calyypo and the early timed Movento treatments resulted in zero SJS infestation of fruit. At the SJS timing Esteem, Movento/Syltac and Movento/Calyypo additionally controlled RAA. At the SJS timing all treatments significantly reduced the incidence of PLH nymphs, with Diazinon providing the best control.
<table>
<thead>
<tr>
<th>Treatment/formulation</th>
<th>Rate</th>
<th>Application</th>
<th>13 Jun</th>
<th>24 Jun</th>
<th>18 Sep</th>
<th>Harvest Eval.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>formulation</td>
<td>amount product/acre</td>
<td>timing</td>
<td>% RAA Infested</td>
<td># PLH Nymphs/shoot</td>
<td>SJS % infest.</td>
</tr>
<tr>
<td>Untreated</td>
<td>---</td>
<td>---</td>
<td>2.4abc</td>
<td>3.4a</td>
<td>14.0a</td>
<td></td>
</tr>
<tr>
<td>Movento 240SC</td>
<td>9 fl oz</td>
<td>BC</td>
<td>1.9abc</td>
<td>1.2bcd</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>+ Damoil</td>
<td>+ 1 % v/v</td>
<td>BC</td>
<td>1.6abc</td>
<td>1.8bc</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>Movento 240SC</td>
<td>9 fl oz</td>
<td>BC</td>
<td>0.4bc</td>
<td>2.1b</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>+ R-11</td>
<td>+ 0.25 % v/v</td>
<td>BC</td>
<td>1.9abc</td>
<td>1.2bcd</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>Movento 240SC</td>
<td>9 fl oz</td>
<td>BC</td>
<td>0.0c</td>
<td>1.9b</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>+ Syltac</td>
<td>+ 0.25 % v/v</td>
<td>BC</td>
<td>0.0c</td>
<td>1.9b</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>Calypso 480SC</td>
<td>4 fl oz</td>
<td>A</td>
<td>0.0c</td>
<td>1.9b</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>Movento 240SC</td>
<td>9 fl oz</td>
<td>B</td>
<td>0.0c</td>
<td>1.9b</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>+ Damoil</td>
<td>+ 1 % v/v</td>
<td>B</td>
<td>0.0c</td>
<td>1.9b</td>
<td>0.0c</td>
<td></td>
</tr>
<tr>
<td>Diazinon 50W</td>
<td>1 lb</td>
<td>D</td>
<td>2.0abc</td>
<td>0.2e</td>
<td>7.0ab</td>
<td></td>
</tr>
<tr>
<td>+ B-1956</td>
<td>+ 0.25 % v/v</td>
<td>D</td>
<td>2.0abc</td>
<td>0.2e</td>
<td>7.0ab</td>
<td></td>
</tr>
<tr>
<td>NNI-0101 20SC</td>
<td>6.36 fl oz</td>
<td>D</td>
<td>3.0ab</td>
<td>0.6de</td>
<td>3.0bc</td>
<td></td>
</tr>
<tr>
<td>+ B-1956</td>
<td>+ 0.25 % v/v</td>
<td>D</td>
<td>3.0ab</td>
<td>0.6de</td>
<td>3.0bc</td>
<td></td>
</tr>
<tr>
<td>Centaur 70WDG</td>
<td>2.14 lb</td>
<td>D</td>
<td>7.4a</td>
<td>1.1cd</td>
<td>2.0bc</td>
<td></td>
</tr>
<tr>
<td>+ B-1956</td>
<td>+ 0.25 % v/v</td>
<td>D</td>
<td>7.4a</td>
<td>1.1cd</td>
<td>2.0bc</td>
<td></td>
</tr>
<tr>
<td>Esteem 35WP</td>
<td>5 oz</td>
<td>A</td>
<td>0.8bc</td>
<td>1.8bc</td>
<td>4.0bc</td>
<td></td>
</tr>
<tr>
<td>Movento 240SC</td>
<td>9 fl oz</td>
<td>E</td>
<td>0.8bc</td>
<td>1.8bc</td>
<td>4.0bc</td>
<td></td>
</tr>
</tbody>
</table>

Means followed by same letter do not significantly differ (P=0.05, LSD).
Statistical analysis performed on arcsine square-root transformed data, data presented are actual counts.

*A, 4 May (Pink); B, 21 May (Petal Fall); C, 4 Jun (1C); D, 20 Jun (2C); E, 16 Jul (Late).