Biology and Management of Bark Beetles in Stone and Pome Fruits

Mike Doerr, Jay Brunner, Tim Smith, and Matthew Smith
WSU-Tree Fruit Research and Extension Center
Wenatchee, WA

Species ID and Life History

- Dominant species was Shothole Borer (SHB), Scyltyus nugiliger.
- Ambrosia beetle (AB), Xyleborus dispar, also important.
- Most locations had both.

Orchard Sanitation to Control SHB

- SHB source removed in winter of 03/04
- Controlling SHB in a high pressure orchard primarily by sanitation
  - 95% shoot infestation recorded within border rows in 2003.
  - The first step was to locate and remove the host material. Source was identified as a brush pile and a firewood pile that was replenished each season.
  - SHB reproduce in 6-18 month old cuttings. Removing this source limits reproductive potential.

- In 2004 a total of 4 SHB and 9 AB were trapped in 5 yellow traps and 2 intercept traps over the entire season.
- No specific SHB insecticide applications needed in 2004.
- No SHB damage noted in fall of 2004.

Insecticide Screening


<table>
<thead>
<tr>
<th>Insecticide</th>
<th>1 DAT</th>
<th>7 DAT</th>
<th>14 DAT</th>
<th>21 DAT</th>
<th>29 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asuon</td>
<td>23.8</td>
<td>52.4</td>
<td>43.8</td>
<td>31.8</td>
<td></td>
</tr>
<tr>
<td>Actara</td>
<td>95.2</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Assail</td>
<td>90.5</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Avaunt</td>
<td>95.2</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Malathion</td>
<td>90.5</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Proclaim</td>
<td>90.5</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Success</td>
<td>71.8</td>
<td>47.4</td>
<td>52.8</td>
<td>24.9</td>
<td></td>
</tr>
</tbody>
</table>

- All insecticides tested caused at least a low level of mortality.
- Asuon was highly toxic through 21 days.
- Actara, Assail and Avaunt also highly toxic.
- Guthion and Malathion had shorter residual activity than the best.

Laboratory study to evaluate host suitability of cherry, pear and apple
- SHB introduced to different host woods in arenas similar to Insecticide screening and emergence of 2nd generation adults was recorded.
- First SHB emerged from apple at 50 days. Emergence from a single arena occurred over a 3-4 week period.
- First emergence in cherry and pear was at 64-days.
- Production was equal in apple and pear. Reproduction in cherry limited by high humidity and mold in arenas.
- Cherry, pear and apple all appear to be suitable hosts for SHB reproduction.

Host Suitability

- In 2003 17% of 1st generation and 41% of 2nd generation were captured from cherry, pear, and apple.
- In 2004 a total of 4 SHB and 9 AB were trapped in 5 yellow traps and 2 intercept traps over the entire season.
- No specific SHB insecticide applications needed in 2004.
- In 2004 a total of 4 SHB and 9 AB were trapped in 5 yellow traps and 2 intercept traps over the entire season.
- No SHB damage noted in fall of 2004.

Monitoring

- SHB adults emerging from reproductive hosts move immediately into neighboring orchards.
- Study sites show SHB readily move 10-50m to healthy trees.
- A practical management option might be to monitor emergence at the source and protect orchard borders when trap captures begin to increase.

- CHB adults emerging from reproductive hosts move immediately into neighboring orchards.
- Study sites show CHB readily move 10-50m to healthy trees.
- A practical management option might be to monitor emergence at the source and protect orchard borders when trap captures begin to increase.