Pest Control Techniques for the Backyard Orchard

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March 4th, Home Orchard IPM
Commercial vs. Backyard
Good Resources

- www.extension.usu.edu/ipm
- www.extension.usu.edu/insectpath
- www.ipm.ucdavis.edu/default.html

- Common Sense Pest Control (Olkowski et al)
- USU Home Orchard Pest Management Guide
- Pests of the Garden and Small Farm

Fundamentals for any garden or backyard orchard:

1. Identify and Suppress the pest(s)
   - Learn how to find and identify pests
   - Understand that rarely can you eradicate them
   - Use inexpensive, non-disruptive approaches

2. Prevent pest problems in the first place
   - Intercept the pest in fall, winter, spring
   - Plant resistant varieties
Monitoring tools and techniques

- Yellow sticky traps
- Two-sided Scotch tape
- Tanglefoot
- Pheromone traps
- Flashlight/headlamp for nighttime scouting
- Slice a pear, peach, or apple and re-visit
- Max/min thermometers
Dealing with common infestations

- Aphids within curled leaves
- Codling moths within fruit
- Armyworms and cutworms underground
- Wood borers in apples, pears, willows, aspens
**Arthropod Pest Suppression**

- **Hand-pick** the eggs, caterpillars, aphids, earwigs
- **Trim off shoots** that are totally infested
- **Water**—briskly applied to leaf tops and undersides
- **Recognize the good guys**
  - Aphid mummies
  - Spider mite predators
Non-OP Pest Suppression

• **If a chemical spray is necessary:**
  – Insecticidal soap
  – Rubbing alcohol as a spreader
  – *Bacillus thuringiensis* (Bt)
  – Horticultural oil
  – Neem oil
  – Imidacloprid (watered in) for apples, pears, crabs, roses, and ornamental tree or shrubs
  – Pyrethroids (esfenvalerate, permethrin, lambda-cyhalothrin)
  – Beware of alkaline, hard water issue.
An Ounce of Prevention

- Row-covers for fruiting vegetables or leafy vegetables (using organdy/screen materials)
- Banding trees with cardboard strips
- Bag the fruit
- BugBarrier (for spider mite, root weevil, plum curculio, cutworms)
Tree Fruit Particulars

- Dormant applications for tree fruit are critical
- For peaches, Bt at bloomtime
- Viral formulations for CM
- For pear psylla and aphids: kaolin clay.
- Lime-sulfur repellent to many leafroller moths.
- Cut out dead/diseased wood
Anarsia lineatella

Peach Twig Borer
Twig Borer Life Cycle
Typical Fruit Damage
2003 Peach Twig Borer Flight Pattern

Nightly Moths Trap-catch/Date

Date

Trapping Results: 2003

- **Total PTB: 4,863**
- **Average per trap: 413**
  - Duration: April-October
- **Ave. per block: 608**
  - Boxelder County: 1,976
  - Utah County: 131

<table>
<thead>
<tr>
<th>Site</th>
<th>Total PTB</th>
<th>Per-Trap</th>
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</thead>
<tbody>
<tr>
<td>Perry</td>
<td>3388</td>
<td>1694</td>
</tr>
<tr>
<td>Willard</td>
<td>564</td>
<td>282</td>
</tr>
<tr>
<td>Kaysville</td>
<td>256</td>
<td>128</td>
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<tr>
<td>Payson</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td>Santaquin</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>N. Santaquin</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>Genola</td>
<td>83</td>
<td>41.5</td>
</tr>
<tr>
<td>Lincoln Pt.</td>
<td>402</td>
<td>201</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>4863</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>608</strong></td>
<td><strong>413</strong></td>
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</tbody>
</table>
# 2003 Shoot Strike Counts

<table>
<thead>
<tr>
<th>Orchard Site</th>
<th>Mean Strikes/tree</th>
<th>Harvest Damage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payson Peaches</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Lincoln Pt. Nectarines</td>
<td>0.06</td>
<td>0.50</td>
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<tr>
<td>Perry Peaches</td>
<td>2.30</td>
<td>26.80</td>
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<tr>
<td>Willard Peaches</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Kaysville Peaches</td>
<td>0.04</td>
<td>0.12</td>
</tr>
<tr>
<td>Santaquin Peaches</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Genola Peaches</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Key Elements for Management

- Overwinters as a larva in hibernacula
- 3-4 generations/year
- First generation targets succulent shoots.
- 2nd and 3rd generations target fruit.
Degree-Days (DDs) for Each Stage

- Total required for a generation: **1,092.6** DDs
  - Pre-ovipositing Adult: **50.4**
  - Ovipositing Adult: **124.2**
  - Egg: **165.6**
  - Larva: **464.4**
  - Pupa: **288.0**
Translate DDs into Biology

• PTB larvae require **3-5** shoots to complete their development.

• Residence time per shoot:
  - **464 DDs / # shoots**
  - between 155 and 93 DDs per shoot.

• Assuming warm temperatures (~22 DDs per day), the residence time is:
  - **4-7 days per shoot**
  - larva will likely be “re-surfacing” every 4-7 days.
2003 PTB Flight and DD Accumulations

![Graph showing Degree-Day Totals and Moths/night over time]

- **Degree-Day Totals**
  - Ranges from 0 to 3500

- **Moths/night**
  - Ranges from 0 to 18

- **Dates**
  - 13 May, 28 May, 10 Jun, 23 Jun, 9 Jul, 22 Jul, 5 Aug, 21 Aug, 3 Sep, 9 Oct

The graph illustrates the accumulation of degree-days and moths/night over the specified dates.
Egg-hatch Relative to Date
(based on DD model projections)
Strategies for 2004

- Accurate trapping is key to precision in management.

- Average DDs for first moth emergence in 2003:
  - $367 \pm 53$ DDs
  - get traps out ~ 250 DDs to ensure reliable biofix.

- 340-640 is likely peak egg-hatch window for 1st generation.

- First generation sprays may need to be initiated at 300-400 DD.
On the Horizon in 2004

• As more and more orchards are abandoned or neglected, beware of:
  – Greater Peachtree Borer
  – Giant CA Prionus Beetle
  – Shothole Borers

• For more information on tree borers, see recent talks by Dr. Alston at: www.extension.usu.edu/SlideShowIndex.htm
Tree Borer Management
(courtesy Diane Alston, March 3rd, 2004)

• Trunk Protection
  – Timing is critical (northern Utah)
    • Ash/Lilac borer – May 1 - late June
    • Bronze birch borer – late May – June
    • Aspen borer – May-July
    • Peachtree (Crown) borer – late June – August
    • Locust borer – August – Sept.
    • Shothole borer – June and late Sept.
• Insecticides: carbaryl, endosulfan, pyrethroids (permethrin, bifenthrin)
Thank you

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  - www.extension.usu.edu/SlideShowIndex.htm