Minimizing insect pest damage to poplars.

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Objectives:

- Forest Stewardship Council.
- Pest specific control strategies.
- Clone selection.
- Management practices.
Forest Stewardship Council

- Prohibits use of most broad-spectrum insecticides.
- Prohibits the use of nine of 16 insecticides registered for poplars.
- Remaining insecticides must be species-specific, applied in a novel way, or ‘new.’
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Before FSC</th>
<th>After FSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endosulfan</td>
<td>Yes</td>
<td>☄ No ☄</td>
</tr>
<tr>
<td>Lambda cyhalothrin</td>
<td>Yes</td>
<td>☄ No ☄</td>
</tr>
<tr>
<td>Carbaryl carbamate</td>
<td>Yes</td>
<td>☄ No ☄</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>Yes</td>
<td>☄ No ☄</td>
</tr>
<tr>
<td>Tebufenozide</td>
<td>Yes</td>
<td>☄ No ☄</td>
</tr>
<tr>
<td>Diflubenzuron (2002)</td>
<td>Yes</td>
<td>Derogation</td>
</tr>
<tr>
<td>Imidacloprid (2004)</td>
<td>New</td>
<td>Yes</td>
</tr>
<tr>
<td>Spinosad (2004)</td>
<td>New</td>
<td>Yes</td>
</tr>
<tr>
<td>CheckMate WPCM-F (2006)</td>
<td>New</td>
<td>Yes</td>
</tr>
<tr>
<td>Indoxacarb (2005)</td>
<td>New</td>
<td>Yes</td>
</tr>
<tr>
<td>Chlorantraniliprole (2009)</td>
<td>New</td>
<td>Yes</td>
</tr>
<tr>
<td>Thiamethoxam (2010)</td>
<td>New</td>
<td>Yes</td>
</tr>
<tr>
<td>Emamectin-benzoate (2011)</td>
<td>New</td>
<td>EUP</td>
</tr>
</tbody>
</table>
Pest species under control

- **Western poplar clearwing moth:** *Paranthrene robiniae* (Pheromone: *CheckMate WPCM-F*)
- **Stem and leaf aphids**, *Phylloxerina* sp. and *Cottonwood Leaf Beetle; Chrysomela scripta* (Chemigation: imidaclorpid).
- **Grasshoppers** *Cannula & Melanoplus* (Ground applied: Diflubenzuron)
- **Green Weevil** *Polydrusus impressifrons* (Aerial: Chlorantraniliprole, Indoxacarb).
Western poplar clearwing moth

• (Checkmate-WPCM-F 2006).
Number of WPCM

No Pheromone: 2002

Partial pheromone Use: 2003
% of trees damaged by WPCM

Year 2003: 40%
Year 2004: 15%
Year 2005: 10%
Year 2006: 5%
Year 2007: 10%
Year 2008: 15%
Year 2009: 20%
Year 2010: 25%
Imidacloprid through the drip line
Imidacloprid through drip line system
Cottonwood Leaf Beetle, Aphids & Phylloxerina sp.,
Grasshoppers

- One week
- Second Week
- Four Weeks

Lorsban
Dimilin
Nolo
Control

Grasshoppers/trap

- Lorsban
- Dimilin
- Nolo
- Control
Defoliating pest populations monitored with pheromone baited traps

Speckled Green Fruitworm *Orthosia hibisci*
Common Pebble *Gluphisia septentrionis*
Fall Webworm *Hyphantria cunea*

(Aerial applied: Diflubenzuron, Chlorantraniliprole, Indoxacarb)
Speckled Green Fruitworm

15 April

[Graph showing moth capture per week from February to June with data points for 2010 and 2011]
Common Pebble *Gluphisia septentrionis*
Common Pebble

Gluphisia septentrionis
Notodontidae

Trichogramma

Eulophus orgyiae
Eulophidae
**PEST POPULATIONS**

- **Speckled Green Fruitworm larvae**
- **Speckled Green Fruitworm eggs**
- **Gluphisia larvae**
- **Gluphisia eggs**

**BENEFICIAL POPULATIONS**

- **Trichogramma spp.**
- **Eulophus orgyiae**
- **Tachinid**
- **Pentatomid**
- **Tachinid**
Average moths/trap/week
Green Weevil
*Polydrusus impressifrons*
Challenging pests that need a solution

- Poplar/willow borer (*Cryptorhynuchus lapathi*).
- Carpenterworm (*Prionoxystus robiniae*).
Poplar/willow borer
Systemic insecticides

Acephate

Emamectin-benzoate
Clones

Clone selection
Mean # PWB found as of 25 MAY 2005

Hannon E., et al., 2008 J.Econ. Ent. 101:199
Carpenterworm

Possible solution: Pheromone Strategy
Carpenterworm pheromone strategies.

- Mating disruption is possible, but too expensive.
- Trapping out is labor expensive, but promising.
### Carpenterworm Trap Out

<table>
<thead>
<tr>
<th>Unit</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tr>
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<td>2</td>
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<td>#47</td>
<td>430</td>
<td>35</td>
<td>6</td>
<td>820</td>
<td>573</td>
</tr>
</tbody>
</table>

- **= Trap out efforts**
- **= Unit adjacent to Trap out unit**
Tenthredinoidea: *Pontania* sp. sawfly populations can be controlled by Coragen®

Hayden Lake Idaho 2009