Alternative Control Methods for Japanese Beetles on Grapes

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Japanese Beetle Life Cycle
Japanese Beetle DON’TS

• **Don’t** use Japanese beetle traps
  – Just say no!

• **Don’t** wait to spray
  – Control low numbers early in the season
  – Damaged leaves bring in more beetles
Why do we need alternative methods for Japanese beetles?

“I still can use Sevin, can’t I?”
Reasons to consider alternatives

• Residual activity
• Days to harvest
• Application method
• Organic alternatives
• Other Pests
• New invasive pests of grapes
  – Brown marmorated stink bug
  – Spotted winged Drosophila
Insecticides for Japanese Beetle in ID-94 at shatter stage

- Actara
- Assail
- Avaunt
- Aza-Direct
- Belay (foliar only)
- Brigade (10WP/2 EC)
- Brigadier
- Danitol
- Imidan
- Mustang Max

- Neemix
- Platinum (soil only)
- Pyganic
- Sevin
- Voliam Flexi
Effectiveness of Recommended Insecticides (ID-94, page 30)

- Highly Effective (++++)
  - Baythroid (3 – 3 days)
  - Danitol (3 – 21 days)
  - Mustang Max (3 – 1 day)
  - Renounce (3 – 3 days)
  - Sevin (1A – 7 days)

Blue = Restricted Use Pesticide (RUP)
Effectiveness of Recommended Insecticides (ID-94, page 30)

- Moderately Effective (++)
  - Assail (4 – 7 days)
  - Brigade (30 – 21 days)
  - Imidan (1B – 7/14 days)
  - Malathion (1B – 3 days)

Blue = Restricted Use Pesticide (RUP)
Effectiveness of Recommended Insecticides (ID-94, page 30)

- Slightly Effective (+)
  - Belay (4 – 0/30 days)
  - Provado (4 – 0 day)
  - Venom/Scorpion (3 – 1/28 day)
What Hasn’t Been Proven

- Adult control through grub control
  - Adults are excellent fliers

- Milky Spore to control grubs
  - Milky disease occurs naturally
Residual Activity

• Formulation matters!
  – Sevin XLR $>>$ other carbaryl formulations

• Systemics provide longer control
  – Platinum 2F
**Pre-Harvest Intervals (days to harvest) for grapes**

<table>
<thead>
<tr>
<th>Product</th>
<th>PHI (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aza-Direct <em>(OMRI)</em></td>
<td>0</td>
</tr>
<tr>
<td>Neemix <em>(OMRI)</em></td>
<td>0</td>
</tr>
<tr>
<td>Provado</td>
<td>0</td>
</tr>
<tr>
<td>Belay (foliar only)</td>
<td>0 (30)</td>
</tr>
<tr>
<td>Mustang Max</td>
<td>1</td>
</tr>
<tr>
<td>Venom (foliar only)</td>
<td>1 (28)</td>
</tr>
<tr>
<td>Malathion</td>
<td>3</td>
</tr>
<tr>
<td>Baythroid</td>
<td>3</td>
</tr>
<tr>
<td>Actara</td>
<td>5</td>
</tr>
<tr>
<td>Assail</td>
<td>7</td>
</tr>
<tr>
<td>Avaunt</td>
<td>7</td>
</tr>
<tr>
<td>Sevin</td>
<td>7</td>
</tr>
<tr>
<td>Imidan</td>
<td>7/14</td>
</tr>
<tr>
<td>Voliam Flexi</td>
<td>14</td>
</tr>
<tr>
<td>Danitol</td>
<td>21</td>
</tr>
<tr>
<td>Brigade</td>
<td>30</td>
</tr>
<tr>
<td>Brigadier</td>
<td>30</td>
</tr>
<tr>
<td>Platinum (soil only)</td>
<td>60</td>
</tr>
</tbody>
</table>
Application Methods

• Most products used as foliar sprays
  – Used as needed with scouting

• Platinum used as a soil application in advance of Japanese beetle arrival
Organic Control Methods

- Fine netting to exclude them during peak flight
  - Shade cloth materials (1/6”)

- Neem oil sprays (2-3 days)
  - Aza-Direct
  - Neemix

- Pyganic (1 day)
Other Pests to Control While Spraying for Japanese Beetle

- Green June beetle
- Leafhoppers
- Grape berry moth
- Asian lady beetle
- Grape rootworm
- Wasps at harvest
New Invasive Pests
Brown Marmorated Stink Bug

• 2010 found in KY
• In at least 12 counties
• Pest of grapes and other fruits
• Builds to high levels June- Aug
• Will taint juice (>9/lug), but not wine
Established Single Specimen Indoor stink bug complaints

Brown Marmorated Stink Bug

First report: Early October 2010
Look alikes that we have in KY
# Crops attacked

## Vegetables
- Beans
- Tomato
- Pepper
- Squash
- Leafy vegetables
- Melons
- Sweet corn
- Eggplant
- Pumpkin
- Cucumber
- Okra

## Fruit
- Peaches & nectarines
- Apples & pears
- Grapes (tainted juice)
- Cherry
- Persimmon
- Black & raspberries
- Blueberries
- Mulberry
- Strawberry
- Figs
- Citrus

## Field Crops
- Corn
- Soybeans
- Tobacco ?
- Cotton ?

## Nut Crops
- Pecans
- Hazelnuts
BMSB as a Household Issue

Aggregate in high numbers in small confined spaces such as:
• behind bookshelves
• beneath mattresses
• inside window AC units

Enter buildings over an 8 to 10 week period high on structure

Stink when disturbed (like cilantro)!

Can feed on houseplants inside (orchids)
# Brown marmorated stink bug

<table>
<thead>
<tr>
<th>BMSB insecticides (T. Leskey: USDA)</th>
<th>Japanese beetle insecticides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malathion 92.5</td>
<td>Malathion ++</td>
</tr>
<tr>
<td>Brigade 91.5</td>
<td>Brigade ++</td>
</tr>
<tr>
<td>Venom 67.3</td>
<td>Venom +</td>
</tr>
<tr>
<td>Danitol (Hi) 66.7</td>
<td>Danitol +++</td>
</tr>
<tr>
<td>Actara 56.3</td>
<td>Actara -</td>
</tr>
<tr>
<td>Belay 55.6</td>
<td>Belay +</td>
</tr>
<tr>
<td>Mustang Max 49.6</td>
<td>Mustang Max +++</td>
</tr>
<tr>
<td>Baythroid 49.1</td>
<td>Baythroid +++</td>
</tr>
<tr>
<td>Provado 40.0</td>
<td>Provado +</td>
</tr>
<tr>
<td>Assail 23.7</td>
<td>Assail ++</td>
</tr>
<tr>
<td>Imidan 20.0</td>
<td>Imidan ++</td>
</tr>
<tr>
<td>Avaunt 11.3</td>
<td>Avaunt ++</td>
</tr>
<tr>
<td>Sevin 9.2</td>
<td>Sevin +++</td>
</tr>
</tbody>
</table>
What we expect next

- Continue to spread to new counties in 2012
- Increased reports of household invasion in Oct/Nov 2012
- 2012 Reports of BMSB as a backyard pest
- 2013 Reports of BMSB becoming a field crop pest
- 2013 or 2014? USDA APHIS approval to release Chinese wasps to help with BMSB
Spotted winged Drosophila

Pest of small fruit including grapes

Found in North Carolina, Virginia, Ohio, Michigan and other states

Can attacks sound fruit before they fully ripen
What makes this fruit fly different is the females ovipositor (egg layer), it has teeth to penetrate the skin of fruit.

Can vector yeasts and bacteria to the berries.
Spotted winged Drosophila

- Attack as fruit turn color
  - Cherry
  - Strawberry
  - Grape
  - Blackberry
  - Raspberry
  - Blueberry
  - Peach
# Spotted winged Drosophila

**SWD insecticides**

(R. Van Steenwyk: 2011)

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>PHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malathion</td>
<td>7 - 14 d</td>
</tr>
<tr>
<td>Danitol</td>
<td>7 - 14 d</td>
</tr>
<tr>
<td>Actara</td>
<td>&lt; 1 day</td>
</tr>
<tr>
<td>Mustang Max</td>
<td>3 - 7 day</td>
</tr>
<tr>
<td>Baythroid</td>
<td>3 - 7 day</td>
</tr>
<tr>
<td>Provado</td>
<td>3 - 7 day</td>
</tr>
<tr>
<td>Assail</td>
<td>1 - 3 day</td>
</tr>
<tr>
<td>Sevin</td>
<td>&lt; 1 day</td>
</tr>
<tr>
<td>Delegate</td>
<td>3 - 7 day</td>
</tr>
<tr>
<td>Entrust</td>
<td>3 - 7 day</td>
</tr>
</tbody>
</table>

**Japanese beetle insecticides**

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malathion</td>
<td>++</td>
</tr>
<tr>
<td>Danitol</td>
<td>+++</td>
</tr>
<tr>
<td>Actara</td>
<td>-</td>
</tr>
<tr>
<td>Mustang Max</td>
<td>+++</td>
</tr>
<tr>
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<td>+++</td>
</tr>
<tr>
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<td>+</td>
</tr>
<tr>
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<td>-</td>
</tr>
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</tr>
</tbody>
</table>

Watch Pre-harvest intervals (PHIs) carefully when spraying close to harvest