Evolving on-farm SWD management programs in tart cherries

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D.S. Jones, M. Haas, L. Gut

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Traverse City, MI
Background and Methods

• Reviewed 2013-2017 spray records from 5-10 farms/yr
  • To gain a better understanding of the impact of SWD and effective on-farm SWD management programs
  • Observed # of full cover equivalent sprays, AIs, rates, spray intervals and strategies (ARM vs. Full cover)
• 2015 – compared spray programs with grower reports of clean or infested fruit prior to or at harvest
• 2016 – compared spray programs with on-farm trapping (5 traps/farm) and fruit sampling for SWD (3 gal per wk per 3 wks)
  • To further observe the relationship of trap counts and when fruit become infested
• 2017 – expanded 2016 methods to WC and SW MI
## Summary of SWD Programs in Tart Cherry

<table>
<thead>
<tr>
<th>Year</th>
<th>Date of 1st SWD adult catch</th>
<th>Avg. # SWD Sprays</th>
<th>Range of SWD Sprays</th>
<th>Harvest timings</th>
<th># of Farms w/ Detectable SWD Larvae at Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 NW</td>
<td>7/29</td>
<td>0-1</td>
<td>7/17 – 8/1</td>
<td>No reports</td>
<td></td>
</tr>
<tr>
<td>2014 NW</td>
<td>6/30</td>
<td>1.8</td>
<td>1.5-2</td>
<td>7/25 – 8/7</td>
<td>No reports</td>
</tr>
<tr>
<td>2015 NW</td>
<td>6/29</td>
<td>2</td>
<td>1-4</td>
<td>7/17 – 8/5</td>
<td>5 of 10</td>
</tr>
<tr>
<td>2016 NW</td>
<td>5/30</td>
<td>3.6</td>
<td>2-6</td>
<td>7/15 – 8/6</td>
<td>6 of 10</td>
</tr>
<tr>
<td><strong>2017 NW</strong></td>
<td><strong>5/22</strong></td>
<td><strong>4.4</strong></td>
<td><strong>2.5-7</strong></td>
<td><strong>7/12 – 8/6</strong></td>
<td><strong>8 of 10</strong></td>
</tr>
<tr>
<td>2017 WC</td>
<td>5/22</td>
<td>3.2</td>
<td>1-5</td>
<td>7/11 – 7/21</td>
<td>3 of 10</td>
</tr>
<tr>
<td>2017 SW</td>
<td>5/24</td>
<td>3.3</td>
<td>2-4</td>
<td>7/3 – 7/5</td>
<td>2 of 5</td>
</tr>
</tbody>
</table>
2013-17 NW MI SWD Trap Line

Avg. SWD trap catch vs. Growing Degree Days Base 42 F

- 2013
- 2014
- 2015
- 2016
- 2017
Percentages of Insecticides Used for SWD in NW

- **2015**
  - 17.5%
  - 7.5%
  - 62.5%

- **2016**
  - 6%
  - 1%
  - 11%
  - 13%
  - 3%
  - 49%

- **2017**
  - 9%
  - 22%
  - 24%
  - 28%
  - 7%
  - 10%

Legend:
- **Lambda-cy** (Warrior, generics)
- **Zeta-cypermethrin** (Mustang Max)
- **Fenpropatrin** (Danitol)
- **Cyfluthrin** (Baythroid, Tombstone)
- **Permethrin**
- **Phosmet** (Imidan)
- **Spinetoram** (Delegate)
- **Cyantraniliprole** (Exirel)
- **Malathion**
Summary of observations for NW MI

• Increasing number of sprays targeting SWD
  • Mainly due to harvest timing; but also earlier pest detection, crop susceptibility, and shortened spray intervals
  • Product selection: the need to control SWD is driving mgmt programs
    • i.e. Late PC mgmt overlap w/ SWD, less imidacloprid (CFF) & Delegate (OBLR)
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- Decreasing insecticide class diversity
  - More pyrethroids used likely due to availability (i.e. they are abundant), efficacy, affordability, processor restrictions

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<tr>
<th>Material</th>
<th>Cost /A est., 2017 data</th>
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<tbody>
<tr>
<td>Mustang Max (e)</td>
<td>$4.06</td>
</tr>
<tr>
<td>Baythroid (g)</td>
<td>$5.03</td>
</tr>
<tr>
<td>Warrior II (e)</td>
<td>$6.25</td>
</tr>
<tr>
<td>Imidan (e)</td>
<td>$22.19</td>
</tr>
<tr>
<td>Danitol (e)</td>
<td>$30.05</td>
</tr>
<tr>
<td>Delegate, 6 oz (g)</td>
<td>$52.90</td>
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<tr>
<td>Exirel, 13.5 oz (e)</td>
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  - Product selection: the need to control SWD is driving mgmt programs
    - i.e. Late PC mgmt overlap w/ SWD, less imidacloprid (CFF) & Delegate (OBLR)
- Decreasing insecticide class diversity
  - More pyrethroids used likely due to availability (i.e. they are abundant), efficacy, affordability, processor restrictions
- Based on MSU’s recommendations, growers are using best management practices *when possible*
  - Limitations are time, labor, cost, equipment, etc.

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2017 Spray Program Observations from WC MI

Dave Jones, Michigan State University Extension
West Central Michigan SWD adult population, 2017
(Sum of 10 sites)
Successful program:

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Day 2</td>
<td>Day 3</td>
<td>Day 4</td>
<td>Day 5</td>
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</tr>
<tr>
<td>Mustang Maxx (full)</td>
<td>Imidan (full)</td>
<td>Imidan (full)</td>
<td>Harvest</td>
<td></td>
</tr>
</tbody>
</table>
### Unsuccessful program:

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Warrior II (full)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Week 2    |       |       |       |       |       |       |       |
|           |       |       |       |       |       |       |       |

| Week 3    |       |       |       |       |       |       |       |
|           |       |       |       |       |       |       |       |

| Week 4    |       |       |       |       |       |       |       |
|           |       |       |       |       |       |       |       |

| Week 5    |       |       |       |       |       |       |       |
|           |       |       |       | Harvest |      |       |       |

- **Warrior II (full)**
- **Imidan (full)**
- **7 Days**
- **10 Days**

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Percentages of Insecticides Used for SWD in WC and SW (2017)

WC 2017
- 51% Lambda-cy (Warrior, generics)
- 22% Zeta-cypermethrin (Mustang Max)
- 8% Fenpropatrin (Danitol)
- 14% Cyfluthrin (Baythroid, Tombstone)
- 6% Permethrin
- 6% Phosmet (Imidan)
- 6% Spinetoram (Delegate)
- 6% Cyantraniliprole (Exirel)
- 6% Malathion
- 6% Lorsban
- 6% Assail

SW 2017
- 58% Lambda-cy (Warrior, generics)
- 12% Zeta-cypermethrin (Mustang Max)
- 6% Fenpropatrin (Danitol)
- 6% Cyfluthrin (Baythroid, Tombstone)
- 6% Permethrin
- 6% Phosmet (Imidan)
- 6% Spinetoram (Delegate)
- 6% Cyantraniliprole (Exirel)
- 6% Malathion
- 6% Lorsban
- 6% Assail
Summary of Observations in WC & SW MI

- WC growers are generally still getting acceptable management.
- The increase in sprays observed in southwest and west central in 2017 represented a major regional shift in SWD management.
- Growers further south are generally applying fewer sprays on average than northwest.
- Programs in northwest and southwest were generally more diverse in products (not necessarily class) than west central.
- Areas that had not previously struggled with this pest are now experiencing difficulty.
- Is this the new norm in the south?
Thank you!

Grower Cooperators

MSU Technicians:

Erin Lauwers, Abby Lalonde, Christie Kandel