Spotted-Wing Drosophila: A new pest in Ohio’s fruit crops

Celeste Welty, Extension Entomologist, Ohio State University, e-mail welty.1@osu.edu, phone 614-292-2803

Introduction
• Looks like common vinegar flies on overripe, fallen, decaying fruit
• But the new species attacks healthy ripening fruit

Detected locations
• In Hawaii since 1980
• California in 2008
• Florida, Washington, Oregon in 2009
• Michigan, Carolinas, Utah in 2010
• Ohio & many States since 2011
• Ohio:
  – First detection in raspberries, September 2011, VanWert County in Northwest Ohio
  – As of September 2018: confirmed in 35 of Ohio’s 88 counties

Hosts
• Early: cherries
• Mid: raspberries, blackberries, blueberries
• Late: grapes
• Also: peaches, plums, strawberries

Damage
• Egg laying & larval feeding
• Starts as tiny scar on skin of fruit
• Skin collapses in 2-3 days; molds

Life cycle
• Larvae feed inside fruit for 5-7 days
• Pupa inside or outside fruit
• 350 eggs per female fly
• One generation in 8-16 days
• Many generations per year
• Overwinters as adult in protected places

Identification
• Adult male:
  – Spots on wings (visible with naked eye)
  – Two dark bands on front leg (need magnifier)
• Adult female:
  – Saw-like, hard ovipositor (need magnifier)

Current Status
• Please alert us if this pest is found or suspected
  – Celeste Welty, at OSU, Columbus
  – Your local county extension educator
Monitoring adult SWD adults with bait traps
• Option #1: commercial trap & lure made by Scentry Biologicals Inc.
  - hang lure from hook in lid of trap
  - make drowning solution: 25% apple cider vinegar, 75% water
  - put solution in trap, 1 inch depth, add drop of detergent (to prevent floating)
  - change lure every 4 weeks
• Option #2: make-your-own traps
  - clear plastic container (1 quart) with lid
  - drill 1/8" holes across top, along one side
  - bait option #1: commercial lure (see above)
  - bait option #2: apple cider vinegar, full strength, 1 inch deep + drop soap
  - bait option #3: yeast + sugar + flour + water in small cup with net lid, float on vinegar
• Use strainer and fine brush to remove trapped insects once per week
• Threshold: capture of a single confirmed SWD adult
• Beware, many non-target insects likely to be caught

Monitoring fruit for SWD larvae using salt tests
• In cup or bag: 2 tablespoons salt + 2 cups warm water + fruit
• After 20 minutes, look for larvae floating to top

Management
• Do not delay harvesting; pick as soon as fruit first ripen.
• Keep harvested fruit cooled as soon as picked.
• Sanitation is critical: collect & destroy damaged fruit every 2 days; put culls in clear plastic bag in sun for 1 week.
• Fine netting is a mechanical control option, especially for organic growers.
• If any SWD found in trap, then fruit need protection by insecticide sprays, starting when fruit begin to ripen (berries start to turn color), until final harvest.
• Spray every 3 - 7 days with insecticides, frequency based on residual activity shown in table below.
• Do a salt test weekly to see if control program working well; if control not good, shorten the spray interval.
• Insecticides for home gardens: see separate document; spinosad is one good choice for most crops.
• For resistance management, rotate among different mode-of-action groups: spinosyns (yellow in chart), diamides (light gray), pyrethroids (pink), organophosphates (blue), carbamates (green), and neonicotinoids (dark gray).
• Adjuvants that can increase efficacy slightly are NuFilm-P, or sugar, or sugar plus yeast, but beware of possible negative effects on pollinators and natural enemies when sugar or yeast attractants are used.

INSECTICIDE OPTIONS (based primarily on trials in OR, WA, CA, MI, NJ, NC, FL):

<table>
<thead>
<tr>
<th>Efficacy on SWD</th>
<th>Mode of action group</th>
<th>Product</th>
<th>Residual activity (days)</th>
<th>Pre-harvest interval (PHI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very effective</td>
<td>§ Delegate</td>
<td>5-7</td>
<td>raspberry, blackberry</td>
<td>1 day</td>
</tr>
<tr>
<td></td>
<td>§ Radiant</td>
<td>5-7</td>
<td>blueberry</td>
<td>1 or 3 days</td>
</tr>
<tr>
<td></td>
<td>§ Exirel</td>
<td>5</td>
<td>strawberry</td>
<td>1 day</td>
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<td></td>
<td>Mustang Max</td>
<td>7-10</td>
<td>grape</td>
<td>7 days</td>
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<tr>
<td></td>
<td>Brigade</td>
<td>7-10</td>
<td>cherry</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td>Hero</td>
<td>7-10</td>
<td>peach</td>
<td>7 days</td>
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<tr>
<td></td>
<td>Danitol</td>
<td>7-10</td>
<td>plum</td>
<td>7 days</td>
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<tr>
<td></td>
<td>Asana</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baythroid</td>
<td>7-10</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Warrior</td>
<td>7-10</td>
<td></td>
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<tr>
<td></td>
<td>Pounce</td>
<td>7-10</td>
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<td></td>
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<tr>
<td></td>
<td>Imidan</td>
<td>7</td>
<td></td>
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<tr>
<td></td>
<td>Diazinon</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective</td>
<td>Malathion</td>
<td>3-5</td>
<td>raspberry, blackberry</td>
<td>1 day</td>
</tr>
<tr>
<td></td>
<td>Entract [OMRI]</td>
<td>3-5</td>
<td>blueberry</td>
<td>1 day</td>
</tr>
<tr>
<td>Moderately effective</td>
<td>Sevin</td>
<td>10</td>
<td>strawberry, blackberry</td>
<td>7 days</td>
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<tr>
<td></td>
<td>Assail</td>
<td>1-3</td>
<td>grape</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td>Grandevo [OMRI]</td>
<td>1-3?</td>
<td>cherry</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td>Venerate [OMRI]</td>
<td>1-3?</td>
<td>peach</td>
<td>7 days</td>
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<tr>
<td>Slightly eff.</td>
<td>Pyganic [OMRI]</td>
<td>1-3</td>
<td></td>
<td></td>
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<tr>
<td>Not effective</td>
<td>Actara</td>
<td>1-3</td>
<td></td>
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<td></td>
<td>Admir Pro</td>
<td>1-3</td>
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</table>

X means that the product is NOT ALLOWED for use on that crop. § Not allowed in greenhouses or high tunnels. OMRI means allowed for use in organic production.