2014 - Spotted Wing Drosophila (SWD) Monitoring Traps

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Based on methods tested by Steven Alm, Professor, Department of Plant Sciences and Entomology, University of Rhode Island and Richard Cowles, Agricultural Scientist, Connecticut Agricultural Experiment Station.

Research continues, to improve SWD traps and baits. As improvements are made, this fact sheet will be updated and posted on www.fruit.cornell.edu/spottedwing/. Revision date April 9, 2014.

Materials for One Trap

- 16 oz Red Plastic Party Cup (clear red cups, clear cups)
- Plastic Drink Cup lid (fragile, may need extras)
- 4.5 oz Specimen Container graduated wide mouth with screw lid
- Fine fabric netting (mesh size < 1 mm to prevent SWD from entering yeast solution)
- 2-3 ft of plastic coated wire (twist tie wire with cutter on a spool is very convenient)

<table>
<thead>
<tr>
<th>Fermenting Flour Yeast Bait recipe</th>
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<tbody>
<tr>
<td>– enough for one specimen container</td>
<td>– enough for six specimen containers</td>
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<tr>
<td>2 tsp Sugar (10 cc)</td>
<td>4 Tbsp Sugar (59 cc)</td>
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<tr>
<td>½ tsp dry active bread yeast (2.5 cc)</td>
<td>1 Tbsp dry active bread yeast (15 cc)</td>
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<tr>
<td>8 tsp whole wheat flour (40 cc)</td>
<td>1 cup whole wheat flour (237 cc)</td>
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<tr>
<td>½ tsp apple cider vinegar* (2.5 ml)</td>
<td>1 Tbsp apple cider vinegar* (15 ml)</td>
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<tr>
<td>2 fl oz warm water* (59 ml)</td>
<td>1½ cups (12 fl oz) warm water* (365 ml)</td>
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</tbody>
</table>

*The proportion of apple cider vinegar to water is 1:24, 1 part vinegar in 24 parts water.

Vinegar Drowning Solution recipe

Apple cider vinegar
drop Unscented** dish detergent

**Unscented detergent may be difficult to obtain, read ingredients.

Other Suggested Materials

Sharpies, pencils; paper towels; squirt bottle; small artist brush; funnel, 6 inch diam (15.24 cm); No-see-um fabric mesh or coffee filters; dump containers for spent bait solutions; bamboo poles or stakes; flagging tape; black electrical tape; hole punch tool (1/8” round, 2” reach); cooler; freeze packs.
Methods for Making a Trap

1. Make a circular ring hanger for the cup out of a double/triple thickness of the wire. This makes it easy to remove the cup and collect the samples. Leave sufficient length of wire to hang the cup on a branch or pole.

2. Make 40 holes around the cup, preferably within the strip of black tape. Leave a wide area without holes to pour out the drowning solution. The holes should be 1/8\textsuperscript{th} inch diam (2 to 3 mm). This will keep larger insects out. A glue gun tip or a hole punch will melt/cut holes without cracking the cup. (McGill Punchline Hole Punch, 1/8 inch round, 2 inch reach.)

3. Make the ampule to hold the fermenting flour bait. With the lid on the specimen cup, cut out the inside of the lid leaving only the outside ring. Cut a 4 X 4 inch (10 x 10 cm) piece of the mesh fabric. Place the fabric over the specimen cup and screw on lid.

4. Assemble trap components. Assembly and addition of baits can easily be done in the field.
Methods for Setting up a Trap

1. It is convenient to fill the ampule with the dry ingredients (yeast, sugar, flour) in the lab.

2. In the field, unscrew the lid to the specimen cup and add ½ tsp apple cider vinegar and 2 fl. oz. of water. Cover with an uncut lid and shake to thoroughly mix ingredients. Replace mesh and lid.

3. Pour the vinegar drowning solution into the red plastic cup until it is about 2 inches deep.

4. Place the ampule of the yeast bait into the trap. It will float in the vinegar drowning solution.

5. Put on the cup lid and hang the trap on a branch, bamboo pole or stake using the wire hanger. Place traps in the plant canopy so they are shaded.

6. Label the trap with a code number for your records. Record the trap GPS coordinates, if needed.

7. Collect trapped insects and change the drowning solution and bait once per week.
Methods for Collecting the Insects

1. Remove the trap from the wire hanger and bring to the collection point (field vehicle). Remove the yeast bait ampule and set aside. Label a plastic bag or plastic cup with the trap number and date.

2. Pour the liquid vinegar bait through a 5”x5” or 6”x6” piece of fabric mesh in a funnel so the drowning solution pours into a waste container and the flies are collected on the mesh.

3. To collect insects that stick to the sides of the cup or the ampule, use a squirt bottle, artist brush or flick the sides of the cup.

4. Place the mesh containing the collected insects into the labeled plastic bag or cup. Close or cover with a lid. Place in a cooler, if out in the field.

5. Discard the yeast bait into a trash bin or bag. Wipe out the specimen container, blot the mesh clean.

6. Refill the trap as described on page 3 and re-hang it.

7. Refrigerate collected specimens until you can count the SWD.