



Spotted Wing Drosophila (SWD) Monitoring Traps

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Based on methods tested by Steven Alm, Dept. of Plant Sciences and Entomology, University of Rhode Island, Richard Cowles, Connecticut Agricultural Experiment Station and Greg Loeb, Dept. of Entomology, Cornell University.

Research has shown that this easy-to-make whole wheat dough & apple cider vinegar trap compares favorably to commercially available traps and lures, although it may catch more non-target insects. As improvements to available traps are made, this fact sheet will be updated and posted on www.fruit.cornell.edu/spottedwing/. Revision date April 12, 2016.

Materials for One Trap

- 16 oz Red Plastic Party Cup
- Plastic Drink Cup lid (*fragile, may need extras*)
- 4.5 oz Specimen Container graduated wide mouth with screw lid
- No-see-um fabric netting (*mesh size < 1 mm to prevent SWD from entering yeast solution*)
- 2-3 ft of plastic coated wire (*twist tie wire on a spool with cutter is convenient*)

Fermenting Dough Bait recipe

– *enough for one specimen container*

1/2 tsp Sugar (2 g)

1/8 tsp dry active bread yeast (0.325 g)

2 TBsp whole wheat flour (17.25 g)

1/5 tsp apple cider vinegar* (1 mL)

1 fl oz water* (25 mL)

*The proportion of apple cider vinegar to water is 1:25. A stock solution can be made with 950 mL water plus 38 mL apple cider vinegar.

Vinegar Drowning Solution recipe

Apple cider vinegar

drop Unscented** dish detergent

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

Other Materials

Hole punch tool (McGill Punchline Hole Punch, 1/8 inch round, 2 inch reach); No-see-um fabric mesh pieces (6x6" and 4x4"); paper towels; squirt bottle; small artist brush; funnel, 6 inch diam (15.24 cm); dump containers for filtering trap contents into; bamboo poles or stakes; flagging tape; sandwich bags; sharpies; cooler; freeze packs; dissecting microscope.

Methods for Making a Trap

1. Make a circular ring hanger for the cup out 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. Leave a wide area without holes to pour out the drowning solution. The holes should be $\frac{1}{8}$ th inch diam (2 to 3 mm). A glue gun tip or a hole punch will melt/cut holes without cracking the cup.
3. Prepare the specimen cup to hold the dough bait. Cut out the inside of the lid leaving a ring. Cut a 4x4 inch (10x10 cm) piece of the mesh fabric. The fabric will be held in place over the specimen cup with the cut-out lid. Fabric corners may be cut to a circle to make it easier to service the trap.
4. Assemble trap components. Addition of apple cider vinegar drowning solution and bait container can easily be done in the field.



Hanger made from twist tie spool wire.



Holes cut near top lip of cup
(black stripe is optional).



Viewed from above, the dough bait container fits inside the cup and floats on the drowning solution.



Red cup trap and specimen container assembly for the dough bait.

Methods for Setting up a Trap

1. The afternoon before servicing traps, prepare the bait. Put dry ingredients (yeast, sugar, flour) in the specimen cup and combine. Add liquid ingredients (water, vinegar) and stir to mix. Put on mesh and cut lid. Store in the refrigerator overnight. Place in cooler to take out to field the next day.
2. In the field, pour apple cider vinegar into the trap (red plastic cup) until it is about 2 inches deep.
3. Place the dough bait container into the trap. It will float in the apple cider vinegar drowning solution.
4. Put on the lid and hang the trap on a branch, post or stake using the wire hanger. Place traps in the plant canopy so they are shaded. About 2-3 ft off the ground is a good height.
5. Label the trap with a code number for your records. (Record the trap GPS coordinates, if needed.)
6. Collect trapped insects and change the drowning solution and bait once per week.



Container with dough bait, after 5 days at room temperature. Mixed dough will initially fill about one third of the volume, allowing enough head space for dough to rise.



Hang traps with plastic-coated wire in or near the canopy.

Methods for Collecting the Insects

1. Remove the trap from the wire hanger and bring to the collection point (field vehicle). Remove the dough bait ampule and set aside. Label a plastic bag with trap number, farm name, and date.
2. Pour the drowning solution through a 6x6 inch 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. Place in a cooler, if out in the field.
5. Wipe out the trap cup, if needed. Replace cracked or broken lids. Refill the trap as described on page 3 and re-hang it.
6. Refrigerate collected specimens until you can count the SWD under a microscope.
7. Washing insects off the mesh into a shallow dish of water allows them to be easily examined with a microscope or hand lens and then moved aside.



Collect insects by pouring the vinegar drowning solution through a piece of mesh fabric.



Insects can be collected from the ampule surface with a squirt bottle.



Place mesh fabric filter in a labeled plastic bag and into the cooler.