

# SPOTTED WING DROSOPHILA MANAGEMENT IN HOME FRUIT PLANTINGS

Diane Brown, Ingham County MSU Extension, and Rufus Isaacs, MSU Department of Entomology

**Spotted wing drosophila** (SWD) is an invasive pest of berries, stone fruit (i.e. cherry, plum), and some pome fruits (i.e. pears) crops. It is native to Asia but was detected in North America for the first time in California during 2008. Since then, it has spread throughout the United States. Across Michigan, SWD has been detected in numerous counties, and we now expect that this fly is distributed throughout the lower peninsula. It has been found in farms, gardens, rest areas, and wild areas so it seems to be well-established in this region. This pest is different from native vinegar flies (small fruit flies), which lay their eggs in decaying fruit. The SWD female uses a saw-like ovipositor to pierce the skin of intact fruit to lay eggs, beginning when the fruit starts to color. Fruit are susceptible to SWD from this time until they are harvested. Eggs hatch inside the fruit, and the small white larvae feed, causing fruit to collapse.

## A. Adult male SWD

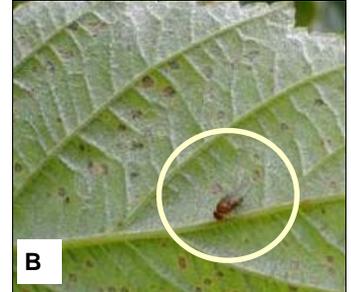
Kurt Stepnitz,  
Michigan State  
University



A

## B. SWD adult on raspberry leaf,

Hannah Burrack,  
North Carolina  
State University



B

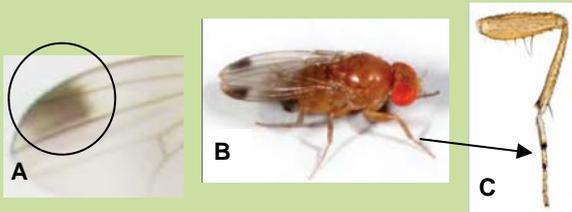
**Actual length:**

■      ■  
5/64" (2 mm) to  
1/8" (3 mm)

## Identifying SWD and their damage

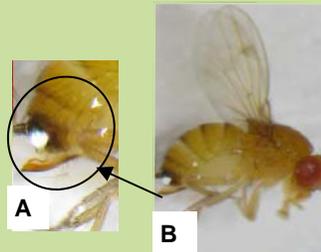
Adults are 2-3 mm (5/64-1/8 inch) long, with red eyes, and rounded abdomens. They are yellow to golden brown in color. Male SWD have a distinctive black spot near the tip of each wing, and two dark bands on each of the forelegs. Females do not have spots on their wings, and are harder to identify. Female SWD have a serrated ovipositor with two rows of teeth that they use to cut into fruit so that they can lay eggs. Adult SWD live for two to three weeks, and females can lay up to 300 eggs in their lifetime. A few days after the eggs are laid, the fruit tissues begin to break down, and legless white larvae can be found within the fruit.

**Identifying male SWD:** A) black spot at wing tip; B) adult male; C) dark bands on forelegs



Male and female SWD Photos: Martin Hauser. SWD larvae: L.E. Iglesias, University of Florida.

**Identifying female SWD:** A) serrated ovipositor; B) adult female lacks black spot at wing tip



**Identifying SWD larvae:** A) they are small (0.003"-0.01"), white and legless, with pointed ends and a darker front end.

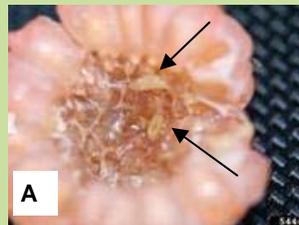


A

## Examples of SWD infested fruit

**Raspberry:** A) larvae in fruit; B) raspberry that has collapsed due to SWD; C) Red staining of the receptacle is a sign of infestation by SWD larvae.

Photo A: Hannah Burrack,  
North Carolina State University, Bugwood.org  
Photos B and C: Diane Brown, Michigan State University



A



## SWD-Infested strawberries

Fruits develop a soft spot on one side.  
Photo: Eric Hanson,  
Michigan State  
University



B



C

## SWD pupa in blueberry

Photo: Brett Blaauw,  
Michigan State University



## SWD Management in Home Fruit Plantings

**Monitoring for SWD activity** A simple monitoring trap can be constructed to determine whether SWD flies are present. The trap is made from a 32 oz plastic cup with lid. Make several 3/16" to 3/8" holes around the sides of the cup, leaving a 3" to 4" section without holes to facilitate pouring out liquid. The holes can be drilled in sturdy containers or melted with a hot wire or wood burner in thinner plastic cups. Pour 1" to 2" of yeast-sugar solution into the trap as bait. To make the bait, add 1/2 tsp active dry yeast to 2 tsp sugar in 2 oz of water. Add a drop or two of dish detergent so that the flies will drown instead of float. To help attract flies and ensure that trapped flies do not escape, a small yellow sticky card can be placed inside the trap. The card can be hung on a small, plastic-covered paperclip that is poked through the lid. Rain or irrigation on these traps can enter through the hole in the lid, thereby diluting the bait. Sealing the hole with a small dab of hot glue or duct tape keeps the water out. Pre-made 3"x 5" yellow sticky cards can be obtained from online gardening supply stores.



A monitoring trap for SWD. Traps should be placed in the fruit zone, in shade.

Traps for SWD are best placed in areas where the flies most like to spend their time, so put them in the shade (usually the north side of the plant), in the fruit zone, using a stake or a wire attached to the sides of the trap, and fastened to a branch or trellis wire. For strawberries the fruit zone is on the ground, whereas for bush fruit or tree fruit, the trap needs to be hung up in the plant. Traps are most likely to catch flies if placed in areas that remain in the shade or have ripe fruit remaining on the plants.

Check traps weekly to determine the presence of first SWD flies. The black wing spots on the males are relatively easy to see with a hand lens or magnifying glass. Change bait every 1-2 weeks and the yellow sticky card weekly. Dispose of the bait away from the trap location. When you find the first SWD, you will need to begin your management program for this pest.



Yellow sticky cards with male SWD circled on right.

**Sanitation and exclusion** One of the most important practices for managing SWD in the home garden is sanitation. Pick fruit as soon as it is ripe, and clean up and dispose of overripe or rotted fruit by sealing it in plastic bags and putting it in the trash. Don't allow it to remain on the ground or on the bushes, to contribute to building the populations of SWD. Keep picked fruit stored in the refrigerator. Refrigeration will stop further development of larvae or eggs if they are present. Freezing fruit if it can't be used within a day or so of picking will kill any larvae or eggs in the fruit. Small plantings may be protected with fine netting to exclude SWD using 1 mm (1/32 inch) mesh. Wait until pollination has taken place to apply the netting so that bees and other pollinators have access to the blossoms.

**Insecticides** Several insecticides that are effective on SWD are labeled for use on fruits in home garden plantings. Before applying a pesticide, always read and follow all directions on the pesticide's label. **The crop (e.g. blueberry, strawberry, raspberry, cherry) must be listed on the label in order to legally use the product on it. Be sure to check the label and follow any restrictions on how long you must wait after you apply the insecticide until harvesting the fruit.** Use protectant insecticide treatments starting when fruit first begins to color and continuing to harvest, according to the label instructions. They will protect fruit from infestation, but will need to be applied before the eggs are laid in the fruit. Choose the most effective insecticides, when known, and check with local Extension staff to learn about the available options. Alternating the use of insecticides with different active ingredients will reduce the chance of insecticide resistance developing in SWD. Do not apply any insecticides during bloom or when bees are active. The most effective products for use against SWD in home fruit plantings contain the active ingredient spinosad or malathion. Pyrethrins, insecticidal soap, neem oil and horticultural oils have very low and short-lived activity against SWD.

Michigan State University is an affirmative-action, equal opportunity employer. Michigan State University Extension programs and materials are open to all without regard to race, color, national origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status or veteran status. The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by MSU Extension is implied.

**MICHIGAN STATE**  
**UNIVERSITY**

**Extension**