



SPOTTED WING DROSOPHILA MANAGEMENT IN HOME FRUIT PLANTINGS

Matthew J. Grieshop, Diane Brown, Rufus Isaacs, Julianna Wilson
MICHIGAN STATE UNIVERSITY Department of Entomology
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Pest background. Spotted wing drosophila (SWD), *Drosophila suzukii*, is a relatively recent and serious pest of wild and cultivated berries (e.g. strawberries, blueberries, raspberries, blackberries) and cherries. It was first detected in California in 2008 and in Michigan in 2010. It is now present throughout much of the world. While SWD is similar in appearance to other vinegar flies, the SWD female possesses a saw-like ovipositor that allows it to lay eggs in ripening as well as rotting fruits. Fruit are susceptible to SWD when they begin to color until they are harvested. Eggs hatch inside the fruit, and the small white larvae feed, eventually causing fruit to collapse. Eggs develop into adults in as little as 8 days and individual females can lay more than 300 eggs, allowing populations to increase rapidly.

Identifying SWD and their damage. Adult SWD are 2-3 mm (5/64-1/8 inch) long, yellow to golden brown in color, with red eyes, and rounded abdomens. Male (but not female) SWD have a distinctive black spot near the tip of each wing, while females have a serrated ovipositor used to deposit eggs into developing fruit (Fig. 1). Larvae are off-white and grow from 0.1 mm when they hatch to 2-3 mm when mature. Larvae develop rapidly and are typically visible within 3 days of hatching. Larval feeding causes rapid break down of fruit tissues (Fig. 2). Mature larvae form a brown pupal case before transforming into adult flies.

Monitoring for SWD activity. A simple monitoring trap can be constructed from a 32 oz plastic cup with lid (Fig. 3). Make several 3/16" to 3/8" holes around the upper sides of the cup, leaving a 3" to 4" section without holes to facilitate pouring out liquid. Pour 1" to 2" of yeast-sugar solution into the trap as bait. Bait recipe: mix 1/2 tsp active dry yeast to 2 tsp sugar in 2 oz of water and a drop or two of liquid dish soap. A 3" x 5" yellow sticky card (available from online gardening supply stores) can be hung in the top of the trap to make flies easier to identify. Traps should be placed in the shade (usually the north side of the plant), in the fruiting zone of your bush or tree. Begin trapping in late May or early June and check them weekly. Change bait and sticky card every 1-2 weeks.



Figure 1. Male SWD with wing spot (above) Female SWD with detail of ovipositor (below)
Photos: Martin Hauser



Figure 2. A) Overly soft raspberry with SWD larva; B) the core left behind after an infested raspberry is harvested is red instead of white; C) strawberries damaged by SWD larval feeding; and D) damaged blueberry with SWD larva on its surface. Photo Credit: A & D) Rufus Isaacs, B) Diane Smith, C) Eric Hanson

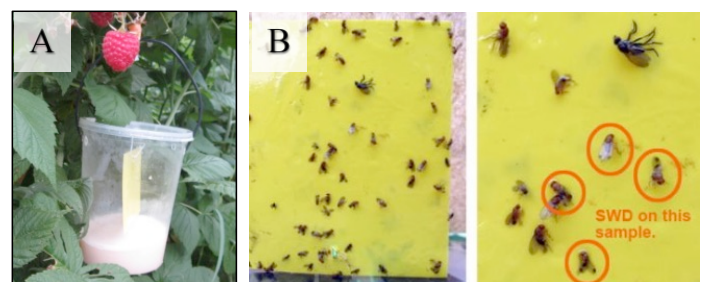


Figure 3. A) SWD trap hung within shaded raspberry canopy, B) Close up of sticky cards showing SWD and non-SWD adult flies.
Photo Credit: A) Heather Leach, B) Steve VanTimmeren

Sanitation and exclusion. Sanitation is a critical SWD management practice for home gardeners. Pick fruit as soon as it is ripe and clean up and dispose of overripe or rotted fruit. SWD damage is greatly reduced when fruit is harvested 3x per week compared to 1x per week. Refrigeration will slow SWD development in infested fruit, but canning or freezing as soon as possible after harvest will kill any larvae or eggs in the fruit. Fruit wastes should be disposed of to prevent the development of SWD. Do not allow fruit wastes of ANY kind (e.g. peels, pressings from juicing, culled fruit) to remain on the ground because this is a major contributor to SWD populations. Small quantities of fruit waste can be



Figure 4. Waste raspberries being solarized in a clear, sealed plastic bag. Photo Credit: Heather Leach

bagged and disposed of in the trash or by freezing. If clear bags are used, the bags can be “solarized” by placing them in a sunny location for >72 hrs (Fig. 4). Large quantities of fruit wastes can be buried at a depth of at least 10 inches. Composting fruit wastes with 1 part poultry manure to 3 parts waste may also reduce SWD emergence – mix

the manure and fruit wastes evenly. Composting without poultry manure is not suggested. 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. Netting is most effective if it covers the entire crop plant – a gap in netting at the ground will

allow entry of SWD. If netting is being added to a hoophouse or other protected culture structure, consider adding an “airlock” to the entry to minimize the chance of SWD entry when people enter or leave the structure.

Insecticides. Chemical control of SWD is highly challenging. Home gardeners should focus efforts on other strategies described above. However, if you decide to use insecticides against SWD, be sure to choose a product that contains an active ingredient that has been shown to kill SWD flies – examples include spinosad, malathion, or a pyrethroid (e.g. bifenthrin, beta-cyfluthrin, esfenvalerate, fenpropathrin). Insecticides containing these active ingredients protect fruit from infestation by killing adults before they lay eggs. For this pest, insecticides need to be reapplied every 7 days once SWD flies are being caught in traps and fruit is beginning to ripen. Pyrethrins, insecticidal soap, neem oil and horticultural oils have very low and short-lived activity against SWD. Larvae within fruit cannot be effectively managed with insecticides. The crop 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 re-entering the treated area or harvesting the fruit. **DO NOT** apply insecticides during bloom or when bees are active. Check with local Extension staff to learn about the available options and consider alternating the use of insecticides with different active ingredients to reduce the chance of the development of insecticide resistance.

For more information

- SWD Biology & Identification: <https://tinyurl.com/MSU-SWD-Biology>
- MSU Extension Gardening in Michigan Fruit Page: https://www.canr.msu.edu/home_gardening/fruit/