Winter 2013
Hannah Burrack
Assistant Professor
Department of Entomology
NC State University

Spotted wing drosophila (*Drosophila suzukii*) biology and management in North Carolina home gardens

What is spotted wing drosophila (SWD)?

Spotted wing drosophila (*Drosophila suzukii*) is an invasive pest of soft skinned fruit which has been detected throughout the United States in the last four years. Female SWD lay their eggs in ripe and ripening soft skinned fruit, unlike nearly all other *Drosophila* species, which feed on rotting fruit. The resulting larvae feed on the fruit, directly damaging it, and may also be presented in harvested fruit.

What fruit are affected by SWD?

In North Carolina, damaging levels of SWD have been found in caneberries (blackberries and raspberries), blueberries, and strawberries, where they attack otherwise sound fruit. SWD have been also occasionally been found in figs, peaches, grapes, and other fruit. SWD often take advantage of other injury to grapes, peaches, and firmer fruit and may not be primary pests in these.

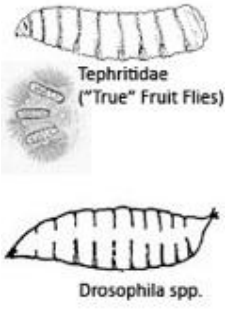
What do SWD look like?

Adult SWD are small (2-3 mm) light brown flies. Male SWD have a distinctive spot on the end of either wing and dark bands of bristles around the base of the last segment on their front legs (called sex combs because they are present only on males). Female SWD lack spots on their wings but can be distinguished by a relatively large, blade-like ovipositor (egg laying devise) at the end of their abdomen.

Non SWD ovipositor (left) and SWD ovipositor (right). Note that these flies have been stored in ethanol. Normally, the ovipositor would be concealed just inside the abdomen.

Non SWD wing (top) and male SWD wing (bottom). Not all small brown flies with spots on their wings are SWD. See here for links to images of non SWD flies which also have spots on their wings: http://bit.ly/MfnKcy

Larvae of *Drosophila* flies are up to 3 mm long, do not have legs or a clearly defined head, and are tapered on both ends. It is impossible to distinguish SWD larvae from other *Drosophila* species, so it is important that you sample only sound, otherwise edible appearing fruit. They have two dark "mouth hooks" in their head. It is possible that blueberry maggot or apple maggot larvae could be present in blueberries or apples respectively, but these "true fruit fly" (Tephritidae) larvae are larger than SWD and have a flat rear end. They will not be present in caneberries, strawberries, grapes, peaches, or figs.



Spotted wing drosophila (*Drosophila suzukii*) biology and management in North Carolina home gardens

How can I determine if SWD is present in my area?

You can monitor adult SWD using traps baited with either apple cider vinegar or a yeast and sugar slurry. See here for a step by step trapping guide: http://bit.ly/KSK1x5 However, both of these lures are less attractive than ripe fruit , so they should only be used to determine SWD presence or absence in an area. Growers, extension agents, and researchers have monitored SWD throughout the southeast for the last three years. You can find trap capture data at the SWD Volunteer Monitoring Network (SWD*VMN) site: http://bit.ly/MfsM9J. SWD*VMN monitoring sites have been active in different years and may not be present in your area, but it is reasonable to assume that SWD are active in locations where they have previously been detected. As fruit ripen, they should be carefully monitored for SWD larvae. You can learn how to sample fruit and detect SWD larvae here: http://bit.ly/KNPJ4c

How can I manage SWD in my garden?

While SWD infested fruit may be unpalatable, larvae are not harmful if consumed. Ripening and ripe fruit are susceptible to SWD attack, but flies do not appear to be attracted to unripe fruit. Good cultural management can reduce SWD damage. Good cultural control includes:

1.Excellent sanitation: fruit should be harvested frequently and completely. Any unmarketable fruit should be removed from the field and either frozen, “baked” in clear plastic bags placed in the sun, or hauled off site to kill or remove any larvae present. When you done harvesting for the season, strip any unwanted fruit from plants and destroy it.

2.Canopy and water management: Prune plants to maintain an open canopy. Do not overwater plants. leaking drip irrigation should be repaired, and overhead irrigation should be minimized.

3.Exclusion: Fruit can be covered with fine mesh bags or paint strainers prior to ripening to exclude flies. Bags should be tightly sealed. Placing a foam plug between branches and the sealed based of bags is useful to prevent plant damage and maintain a tight seal.

4.Regular fruit sampling: Fruit should be observed regularly for infestation before and during harvest.

While cultural control may be sufficient to reduce SWD infestation below damaging levels, insecticides are currently the most effective tool to reduce or possibly prevent SWD infestation. Insecticides can only be applied to plants for which they are labeled. The label is the law! County extension agents and university specialists can assist with selecting effective, appropriate insecticides. There are some organically acceptable insecticides available for SWD, but they are less persistent than conventional materials and may need to be applied more frequently.

Read us @ www.ncsmallfruitsipm.blogspot.com
Follow us @NCSmallFruitIPM on Twitter
Like us @ http://www.facebook.com/NCSmallFruitIPM

Spotted wing drosophila research and extension efforts are supported by the North Carolina Tobacco Trust Fund Commission, Inc., the NC Department of Agriculture & Consumer Services Specialty Crop Block Grants Program, and the North Carolina Blueberry Council, Inc.