National Pest Alert

Spotted Wing Drosophila

Drosophila suzukii

Introduction

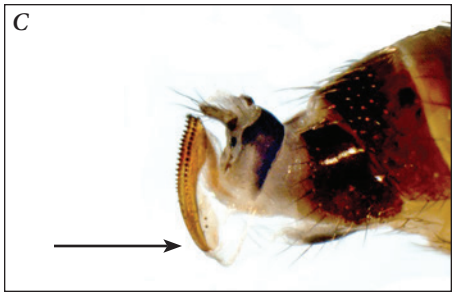
The Spotted Wing Drosophila (SWD), *Drosophila suzukii*, is a small vinegar fly that damages many fruit crops. Unlike most other vinegar flies that require damaged fruit to attack, SWD causes damage when the female flies cut a slit and lay eggs in healthy fruit. This insect is a pest of blueberry, blackberry, raspberry, strawberry, cherries, grapes and tree fruits, with a preference for softer-fleshed fruit. Given its potential to infest fruit, it is important to learn about monitoring and management of SWD to minimize the risk of larvae developing in fruit and affecting fruit marketability.

Spotted Wing Drosophila was first discovered in the western United States in 2008 and is now well-established throughout North America and Europe.

Damage

Female SWD can cut into intact fruit using their serrated ovipositor to inject eggs under the skin. Consequently, the larvae of SWD can be present during ripening, and will be in after harvest. Damage to fruit by egg laying and larval feeding can lead to secondary fruit rots as fungal diseases may be introduced, further affecting fruit quality. There is a greater risk of fruit contamination at harvest from SWD compared with native vinegar fly species that lay eggs only in already-damaged and rotting fruit.

The adult SWD lives for about two weeks and can lay more than 300 eggs. This demonstrates their high potential for fruit infestation and distribution through a field if not controlled. Infested fruit do not show obvious symptoms of infestation at first, with only a small pinprick visible from egg-laying. Within a few days, the fruit flesh will start to break down, leading to discolored regions and eventual collapse of the tissues. By this point, the white larvae can be relatively easy to detect.

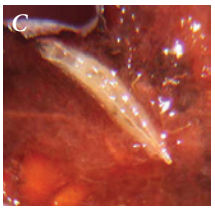


Identification of Spotted Wing Drosophila flies. A: Adult male flies are 2–3 mm long and may be seen on the outside of fruit. B: The male SWD has two distinctive dots on the wings (females do not have the wing spots). C: On the female SWD, the serrated ovipositor is a distinctive feature. It has two rows of serrations which it uses to cut into healthy fruit.

Photos by Martin Hauser (A, C) and Gevork Arakelian (B).

Regional IPM Centers

USDA United States Department of Agriculture National Institute of Food and Agriculture



Fruit infestation symptoms: A: Blueberry with oviposition holes from female SWD. B: Diseased cherry tissue associated with SWD infestation. C: SWD larvae are white and visible against the darker fruit. Photos by Tracy Hueppelsheuser (A & C) and Peter Shearer (B).

SWD Management

There are three important components to effective SWD management: Monitoring, Identification, and Control.

Monitoring: The first and most important step is to determine whether SWD are present, ideally before the fruit start to ripen and become susceptible. This can be done using a simple monitoring trap, consisting of a plastic 32 oz. cup with several 3/16″ diameter 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 burned with a hot wire or wood burner in the thinner plastic cups. Pour 1″ to 2″ of bait into the trap to attract flies. SWD can be baited with apple cider vinegar, but traps are more sensitive and catch flies earlier if baited with a simple solution of baker's yeast and sugar. To ensure that trapped flies do not escape, a small yellow sticky trap can be placed inside the trap. Traps are hung in the shade 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. Check traps at least weekly for SWD flies on traps and in the liquid, and replace the bait with fresh liquid. Pour the old bait into a bottle or away from the trap location, and place traps back near the crop. Continue monitoring through harvest and post-harvest.

Monitoring trap for SWD. A plastic container with holes, containing a yeast-sugar solution as a bait, and a sticky trap to catch flies. Traps may also be used without the yellow sticky trap if a drop of unscented soap is added to the bait. Count the flies in the liquid weekly and then replace the liquid. Photo: Steve Van Timmeren.

Identification: Some native species of vinegar flies and other insects will be attracted to the traps. These need to be distinguished from SWD flies. Vinegar flies are small (2–3 mm) with rounded golden brown abdomens. Examine the wings of trapped vinegar flies using a 30× handlens. Some small native flies have dark patches on the wings, but will not have the distinctive dark dot that is present on both wings of SWD males. Female SWD are harder to identify, but this can be done by using a hand lens to examine the ovipositor (see photo). Keep a clear record of the number of SWD detected at each trap site. If you need help identifying SWD please contact your local Extension Agent.

Sanitation: The most important management method that growers can adopt to minimize the buildup of SWD is sanitation. If SWD is present be sure to pick ripe fruit in a timely manner. Remove rotten, damaged or dropped fruit and do not place them in a compost pile. Discarded fruit must be sealed or buried to prevent flies from emerging.

Removal of wild host plants such as mulberry, honeysuckle, pokeweed, wild grape, etc., adjacent to your fruit crop may also help reduce SWD damage.

Chemical Controls: Management of SWD with chemical controls is challenging because fruit are attacked close to harvest. Be sure to play close attention to pre-harvest intervals on any product you use. Contact your local Extension Educator for insecticide recommendations for management of SWD.

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For information about the Pest Alert program, please contact Laura Iles, co-director of the North Central IPM Center, at ljesse@iastate.edu.

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