

National Pest Alert



Spotted Wing Drosophila *Drosophila suzukii*

Introduction

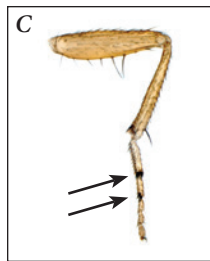
The Spotted Wing Drosophila (SWD), *Drosophila suzukii*, is a small vinegar fly with the potential to damage many fruit crops. In the North Central region, it was first detected in Michigan in late September 2010 and is now widespread. Unlike most other vinegar flies that require damaged fruit to attack, SWD causes damage when the female flies cut a slit and lay eggs in healthy fruit. This insect is a pest of most berry crops, cherries, grapes and other tree fruits, with a preference for softer-fleshed fruit. Given the propensity for this insect to spread and 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. Because the flies are only a few millimeters long and cannot fly very far, human-assisted transportation rather than natural dispersion is the most likely cause of the recent rapid spread.

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, leading to a risk of detection of larvae in ripe fruit after harvest. During egg-laying, sour rot and fungal diseases may also 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.

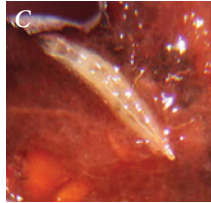
B: The male SWD has two distinctive dots on the wings (females do not have the wing spots). C: Male flies also have two dark bands on the forelegs. D: On the female SWD, the serrated ovipositor is a distinctive morphological feature, longer than other vinegar fly species and with two rows of serration. Photos by Martin Hauser (A, C, D) and Gevork Arakelian (B).

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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.

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× hand lens. 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. Given the importance of early detection, it is impera-



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.

tive that potential SWD detections in new areas are confirmed by sending samples in a ziplock bag or small vial to your state's diagnostic laboratory along with date and location of collection. If the presence of SWD is confirmed, management activities should be initiated immediately to reduce populations and protect fruit.

Control: There are some important cultural controls that growers can adopt to minimize the buildup of SWD. These include ensuring timely crop harvest and removal of overripe fruit, removal of wild host plants such as wild grape, raspberry, blackberry, etc., from nearby fields. If SWD are detected in fruit farms, active management programs should be implemented immediately, including the cultural controls described above, coupled with monitoring and control of adult flies using insecticides with knock-down activity. Contact your local Extension Educator for pesticide recommendations for management of SWD. Additional monitoring should be done to determine the approximate distribution of SWD across various fields.

North Central region's fruit growers already use IPM programs to manage fruit flies during the summer months, and these programs will provide some protection against SWD. However, female adult SWD lay eggs soon after emergence and will complete multiple generations under climate conditions in the North Central region, so active monitoring and effective responses are essential.

For more information on spotted wing Drosophila, please visit www.ncipmc.org/action/alerts/drosophila.php

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