



Spotted Wing Drosophila

Part 1: Overview and Identification

Spotted wing drosophila (SWD), *Drosophila suzukii*, is an invasive vinegar fly that was introduced into California in 2008 and has since been found in other states, including many in the Northeast in 2011. SWD differs from other vinegar (aka fruit) flies in that females can lay eggs in immature fruit, and thus SWD larvae can be found in fruit that is just ripening. In the Northeast, SWD has been most problematic on fall raspberries and blackberries, though late season peaches and grapes have also been affected. Because this pest is similar in appearance to common vinegar flies, the greatest problems have occurred where populations went unnoticed and thus remained untreated until they were quite high.

SWD are thought to overwinter primarily as adult females, and they prefer moderate, cool, wet climates. Adults live for about 2 to 9 weeks. During this time, an adult female can lay 100 to 600 eggs in fruit, which she begins doing as fruit starts to color and sugar levels begin to rise. Eggs hatch in 2 hours to 3 days, and the larvae feed in the fruit for about 3 to 13 days. They then pupate for 3 to 15 days either inside or outside the fruit before emerging as adults. Thus, multiple generations occur per year.

Early season crops such as June-bearing strawberries or cherries escaped significant damage in 2011, but as the summer progressed the pest's population increased, peaking sharply in September. It is not known how well SWD will overwinter in the Northeast nor whether early season fruit crops will be at greater risk in the future.

SWD gets its common name because the males usually have one obvious spot on each wing (Figs. 1a and 1b), although at times it can be faint or missing (Fig. 1d). Hence, the defining characteristic in males is the presence of two black bands (sex combs) on each front leg (Fig. 1c). SWD females have a larger sawlike ovipositor (Fig. 1e) than other species. However, because they have no markings that assist in discerning them from other common vinegar fly species, monitoring for female SWD is not recommended.

Other Vinegar Fly Species That Resemble Spotted Wing Drosophila

Other species of fruit or vinegar flies in the region have spots on their wings and thus could be mistaken for spotted wing dro-

sophila. These are discussed below, and photos accompanying each species illustrate the differences. All of these species are similar in size.

Scaptomyza sp.

Flies in the genus *Scaptomyza* are commonly found feeding on decomposing organic matter. One species in this genus that has spots on its wings (possibly *S. adjusta*) was found in Pennsylvania plantings primarily during the summer. It was present on decomposing straw in matted-row strawberry fields and on damaged or otherwise unmarketable fruit, including apples. Other species may be known to growers of cruciferous crops as leafminer pests, but they are not pests of fruit nor do they have spots on their wings. Some *Scaptomyza* species are present in fruits or nuts that were previously colonized by other insects.

In *Scaptomyza* sp. males, the wing spot is at the wing tip and is smaller (Figs. 2a and 2b) and the front legs lack markings (Fig. 2c). Specimens are more common in the summer and fewer in the fall.

Leucophenga varia

Leucophenga varia could be easily mistaken for SWD since its highest populations are also present during the fall and it has similar spots on the wings. However, the spots are smaller, fainter, and farther from the wing tip than with SWD. This species feeds on fleshy fungi.

In *Leucophenga* sp. males, the wing spot is faint and located between the wing edge and first vein (Figs. 3a and 3b) and the front legs lack markings (Fig. 3c). Unlike in SWD males, the markings on the abdomen are spots rather than stripes.

Chymomyza amoena

Chymomyza amoena is found in the region from mid-summer through fall. This species is not a pest of fruit but feeds on decomposing organic matter, including many fruits and nuts. It may be found in husks of black walnut or in other nuts after they have been damaged by other insects.

In *Chymomyza amoena* males, the wing spots nearly traverse the wings (Figs. 4a and 4b) and the front legs lack markings (Fig. 4c). Specimens are more common from mid-summer to fall. Adults overwinter in fallen apples.

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Figures 1–4. Male spotted wing drosophila (SWD) versus males of vinegar fly species that are similar in appearance.

Figures 1a–1c. Spotted wing drosophila (*Drosophila suzukii*).



Figures 2a–2c. *Scaptomyza* sp.



Figures 3a–3c. *Leucophenga varia*.



Figures 4a–4c. *Chymomyza amoena*.



Figure 1d. About 15 percent of SWD males have either faint spots or lack them altogether (above). Note that the front leg (upper right corner) has the two black bands. This characteristic is exhibited by all SWD males.

Figure 1e. Sawlike ovipositor of a female SWD, which allows her to lay eggs in ripening fruit. SWD females do not have wing spots or black bands on their legs like males do.

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