



# Spotted Wing Drosophila

## Part 1: Overview and Identification

Spotted wing drosophila (SWD), *Drosophila suzukii*, is an invasive vinegar fly that was first detected in the United States in 2008. Unlike other vinegar (fruit) flies that only exploit overripe and rotten fruit, SWD females can lay eggs in immature and ripe fruit; thus, its larvae can be present in otherwise marketable fruit.

Since its introduction into California, SWD has dispersed throughout much of the United States. It was first found in northeastern states in 2011. Within this region, SWD has been most problematic on blackberries and fall raspberries. Blueberries that ripen from mid- to late season, late summer raspberries, and day-neutral strawberries also have been severely affected. In some crops, secondary effects of SWD damage have been of greater consequence than direct infestation, such as increased incidence of fruit rots in grapes.

SWD prefers a moderate climate and high humidity. Adults live for up to 2 months during the growing season. During this time, an adult female can lay hundreds of eggs, which quickly hatch into larvae. Following pupation either inside or outside the fruit, new adults emerge. A generation can be completed in 10 to 20 days; thus, multiple generations occur per year. SWD are thought to overwinter primarily as adult females in the Northeast.

SWD populations decrease markedly during northeastern winters, so spring populations have started out very low. So far, this has allowed early season crops such as June-bearing strawberries or cherries to escape damage. Whether early season fruit crops will be at greater risk in the future is not yet known, so growers are urged to closely monitor all susceptible crops. As the season progresses, the pest's population increases sharply, peaking during the fall.

The basis for the name "spotted wing drosophila" is one obvious spot on each of the males' wings (Figs. 1a and 1b), although at times the wing spot can be faint or missing (Fig. 1d). Hence, the defining characteristic in males is the presence of two black patches of hairs (called sex combs) on each front leg (Fig. 1c). SWD females have a larger sawlike ovipositor (egg-laying device, Fig. 1e) than females of other fruit fly species, but they have no other distinguishing markings or features; thus, identification of female SWD is not as straightforward as with males.

### Other Species That Resemble SWD

Other species of fruit or vinegar flies in the region also have spots on their wings and could be mistaken for spotted wing drosophila. Differences are discussed below, and accompanying photos illustrate the details. 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*) has been found in Pennsylvania plantings primarily during the summer. It is commonly found on decomposing straw in matted-row strawberry fields, and on damaged or otherwise unmarketable fruit, including apples. Other species of *Scaptomyza* 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.

In *Scaptomyza* sp. males, the wing spot is smaller and at the wing tip (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, as its highest populations are present during the fall and it has similar spots on the wings. This species feeds on fleshy fungi.

In *Leucophenga* sp. males, the wing spot is smaller and fainter than on SWD, and it is located between the wing edge and first vein (Figs. 3a and 3b). The front legs of *Leucophenga* sp. lack markings (Fig. 3c), and its abdomen is marked with spots (Fig. 3a) rather than stripes as with SWD (Fig. 1a).

### *Chymomyza amoena*

*Chymomyza amoena* is found in the region from midsummer through fall. This species is not a pest of fruit, but it 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 spots nearly traverse the wings (Figs. 4a and 4b), and the front legs lack markings (Fig. 4c). Adults overwinter in fallen apples.

### Another New Invasive

African fig fly (AFF), *Zaprionus indianus*, was found in Pennsylvania in traps deployed to monitor for SWD. AFF is a pest of tropical and subtropical fruits in its native range. To what extent AFF will damage local fruit crops is unknown. AFF females lack the imposing ovipositor that SWD has, so it is unlikely to be the instigator of fruit damage, but it may lay eggs in fruit already damaged by SWD. AFF is unique in coloration, with white stripes outlined in black running the length of its body. It is slightly larger than other vinegar fly species.

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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. Note that the front leg (upper right corner) has the two black sex combs.

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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 Photos 1a through 4c courtesy of A. Surcică  
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