

## **Problem:** Spotted Wing Drosophila - *Drosophila suzukii*



**Hosts:** Blackberries, blueberries, boysenberries, raspberries, strawberries and grapes.

**Description:** The spotted wing drosophila resembles other native vinegar and fruit flies. Adults are 2 to 3 mm long with red eyes, a yellow-brown thorax, and black stripes on the abdomen. Active during the day, they prefer moist conditions and temperatures between 68 and 70°F. Activity decreases at temperatures above 85°F. Adults are susceptible to moisture loss and may die within 24 hours without water. Spotted wing drosophila males can be distinguished from native vinegar and fruit flies by a spot near the tip (outer edge) of each wing and two dark bands on the front legs. The female does not have a wing spot but can be distinguished from other vinegar and fruit flies by the large, sawlike ovipositor used for laying eggs. Two rows of serrations (See reference 1 below) allow the female to pierce the skin of unripened, immature fruit to deposit eggs. More than one egg may be laid in each berry or fruit, which may allow soft rots and fungal diseases to enter.

**Life Cycle:** Adult females live approximately 2 weeks and deposit between 100 and 300 eggs from spring through fall. The number of eggs depends on the temperature and the host plant. Life stages are egg, larva, pupa, and adult. Eggs hatch into white larvae that feed inside berries or fruit for 5 to 7 days. Typically, larvae pupate inside fruit, but they also may pupate outside the fruit unlike other vinegar and native fruit flies. Females are capable of laying eggs almost immediately after emerging. A key difference between spotted wing drosophila and other fruit flies is that most native fruit flies lay eggs into damaged or rotting fruit. **Spotted wing drosophila females attack healthy, ripening berries or fruit as well as damaged or split fruit.** In general, darker colored fruit is more susceptible. Females prefer to lay eggs in thin-skinned berries or fruits. Thick-skinned varieties may be less susceptible.

Spotted wing drosophila may attack berries and fruits throughout the growing season. They continue to lay eggs in fallen fruit after harvest, and offspring develop in fallen or rotting berries or fruit. As a result, this insect pest reproduces rapidly generating multiple generations per year. Spotted wing drosophila overwinters as an adult, and winter severity may influence survival.

### **Recommendations:**

**Cultural Control** - Spotted wing drosophila can be managed with cultural controls throughout the growing season. These include harvesting berry and fruit crops early and removing and destroying overripe, infested, or culled fruit. It is also recommended that potentially infected berries and fruits are buried 2 feet deep to kill adults, larvae, and pupae. To kill eggs and larvae, collect fruit, place in sealed plastic bags, and expose bags to full sunlight for a week. Prevent infestations by removing wild host plants such as grapes, blackberries, raspberries, American pokeweed, crabapples, dogwood, and Japanese yew from nearby locations to keep the fruit of these plants from serving as reservoirs for spotted wing drosophila populations during the growing season. Growers also may want to place protective netting over berry

crops. It should be installed after pollinators (bumble bees and honey bees) have finished pollination but before fruit ripens to keep flies from becoming trapped inside. Because warm temperatures associated with compost piles may enhance spotted wing drosophila development, growers should avoid composting infested or culled fruit.

**Insecticides** - Insecticides can be used to suppress spotted wing drosophila populations during the growing season. Those effective against the pest include malathion, carbaryl (Sevin), spinosad (Spintor; Success; Monterey Garden Insect Spray; Bonide Captain Jack's Dead Bug Brew), spinetoram (Delegate and Radiant), and a number of pyrethroid-based insecticides with the active ingredients: beta-cyfluthrin (Bayer Vegetable & Garden Insect Spray), Bifenthrin (Hi-Yield Bug Blaster Bifenthrin), esfenvalerate (Hi-Yield Bug Buster II), fenpropathrin, and zeta-cypermethrin.

The neonicotinoid insecticides (acetamiprid, imidacloprid, and thiamethoxam) tend to be less effective than other insecticides against adults. Check the label to determine if an insecticide is registered for use against the pest. Because spotted wing drosophila is a relatively new insect pest, reliable treatment thresholds have not been established.

Insecticides should be applied from the time fruit begins to color until harvest. Because this pest prefers to live within the plant, it may be difficult to suppress populations with insecticide spray applications. Application timing and coverage are critical. Insecticides must be applied in time to kill adults before egg-laying because spraying will not kill larvae already inside the berry or fruit. For better fruit coverage, growers may need to increase water volume or use a surfactant such as a spreader-sticker. Pruning fruit trees to open up the canopy may improve effectiveness.

Rains can reduce longevity of insecticide residues, so repeat applications may be required. The interval and frequency of insecticide spray applications also can influence the effectiveness of spotted wing drosophila suppression programs. Because of the number of generations per year, spraying once or twice a week may be warranted. Application frequency varies depending on the environment (e.g., rainfall and temperature) and growing conditions. Frequent applications needed to treat multiple generations per year may result in intense selection pressure and lead to insecticide resistance. Consequently, it is critical to use insecticides with different modes of action and to rotate them to reduce the development of insecticide resistance.

Insecticide applications may harm beneficial insects and mites that regulate populations of pest mites, leafminers, and scales. Two insecticides available to organic producers are spinosad (Entrust) and pyrethrins (Pyganic). Both have short residual activity (1 to 3 days), and spotted wing drosophila females exposed to Pyganic may recover to lay fertile eggs. In addition, certain spotted wing drosophila populations in California have developed resistance to Pyganic.

**Note:** The material for this factsheet came almost entirely from reference "1" below which includes additional images of the insect.

**References:**

1. [Spotted Wing Drosophila](#), K-State Research and Extension, Department of Entomology, MF3158
2. [Spotted Wing Drosophila \(Drosophila suzukii\)](#), Purdue University Extension, Department of Entomology, April, 2014

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