

SPOTTED WING DROSOPHILA (SWD)

Drosophila suzukii

Description:

Adults:

Small flies (0.1 in or 3 mm) with red eyes, a pale brown thorax and dark, unbroken black bands on the abdomen. Males have spots on the tip of the wings that can be seen with the naked eye, but females lack this characteristic. Females have a large, dark saw-like ovipositor used to pierce the skin and lay eggs in fruit.

Eggs:

Eggs are milky white, oblong in shape and have two long, threadlike tubes that protrude from the skin of fruit. One to three eggs are laid per sting.

Larvae:

Larvae are tiny (up to 0.14 in or 3.5 mm), white, cylindrical maggots that are found feeding inside fruit. One or more larvae may be found feeding within a single fruit. Mouthparts appear black on the anterior end, although larvae are difficult to distinguish from other maggots.

Pupae:

Oblong in shape and ranging from light brown to dark brown as pupa develops. Spiked protrusions from the anterior end that are used for breathing. Pupation occurs partially inside or outside the fruit.

Hosts:

Raspberry, blackberry, blueberry, strawberry, cherry and grape, depending on the cultivar. Occasionally plum, plumcot, nectarine, kiwi and fig when conditions are right.

Damage:

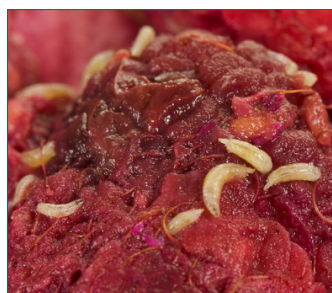
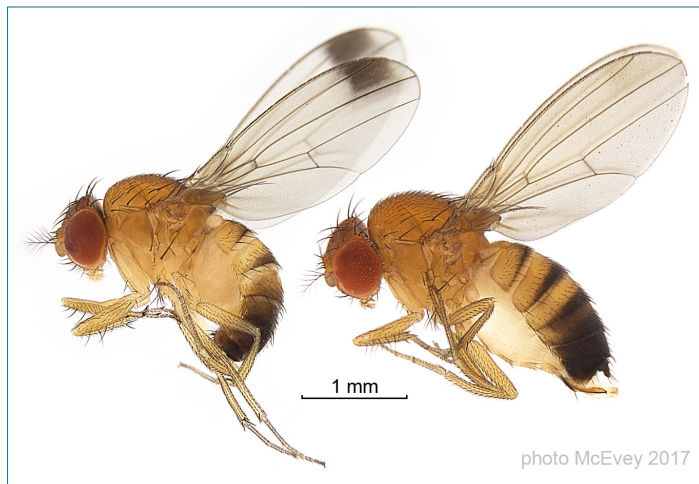
- Oviposition of the females causes sting on the fruit surface.
- Larval feeding inside the fruit causes the flesh of the fruit to turn brown and soft.

Phenology:

- Overwinters as adults in protected areas.
- Life cycle can be completed in 10-21 days; eggs hatch inside the fruit 1-3 days after being laid, three larval instars completed in 3-13 days, pupation is completed in 4-5 days and adults 3-9 weeks.
- Up to 15 overlapping generations per year, depending on environmental conditions and location.

Lure Type and Maintenance:

- PHEROCON® SWD PEEL-PAK™ Broad Spectrum Lure for higher capture of SWD.
- PHEROCON® SWD High Specificity Lure to reduce capture of non-target insects.
- Change lures every 4-6 weeks, depending on environmental conditions.



Top: SWD adults, male (left) and female (right) (source: McEvey 2017)
 Bottom left: SWD larvae in raspberry (source: MSU IPM)
 Bottom right: Oviposition stings in blueberry (source: StopSWD.org)

Lure Storage:

- Store in unopened factory-sealed packages in a refrigerator (32° F-45° F or 0° C-7.2° C).
- DO NOT store in freezer.
- Refrigerate carryover for annual storage.

Trap Design:

- PHEROCON® SWD cup trap or PHEROCON® SWD STKY™ trap.

Placement Time:

- Well before fruit ripening to determine presence of flies.
- Monitoring is recommended from first fruit color until crop is harvested.

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Placement Pattern:

Cherries, peaches and plums

- Place traps 3-6 ft (1-2 m) off ground.
- Hang from a shaded branch in the tree canopy.
- Place traps in an edge row of the orchard, on the border of wild hosts if present.

Blueberries, strawberries, canefruit and other susceptible fruit

- Generally, attach traps to stakes, trellis wire or wooden posts near plants.
- For blueberries: place traps in shaded area in the canopy of plants and low within the fruit zone.
- For strawberries: place traps in the shady canopy of the plants, if possible.
- For canefruit: place traps on corners, middle and edge of field in shaded areas.

Trap Density:

	<i>Number of traps</i>	<i>Acres</i>	<i>Hectares</i>
Cherries, peaches and plums	Minimum of 3-4 traps per orchard	< 40	< 16.19
Blueberries, strawberries, canefruit and other susceptible fruit	Use 4-6 traps per field	< 40	< 16.19

Trap Maintenance:

- Check traps at least once, but preferably twice per week.
- Count the number of male flies (ones with spots on the wings) and remove flies.
- For PHEROCON® SWD Trap:
 - Insert lure hanger through hole in top of lure and put the other end of lure hanger through the hole in the lid of the trap.
 - May be used with natural bait or neutral drowning solution inside trap.
 - When servicing trap, count and remove all captures and pour residual liquid into another container and remove from area where traps are in use. Entirely replace with fresh solution.
- For PHEROCON® SWD STKY™ Trap:
 - Hang trap from host tree branch, bush, trellis wire or on wooden stake within the fruit zone and in a shaded area, if possible.
 - Hang lure at the top of the trap so the bottom of the lure is just touching the adhesive. Do not press lures into adhesive.
 - Replace traps every 4 weeks, or when adhesive is fouled with dust or insect debris.
- Change lures every 4-6 weeks, depending on environmental conditions.

Recommendations:

- Management of SWD is required any time susceptible fruit and flies are present at the same time.
- Thresholds have not been developed, but a provisional threshold is the capture of a single adult and presence of susceptible fruit.

Alternative Recommendations:

- Counting male flies should be adequate for determining whether SWD is present, and for observing if populations are increasing or remaining at the same levels.
- Apply insecticides based on field history of trap captures with the goal of preventing oviposition; insecticides do not control larvae within fruit.
- After treatments, if traps indicate that adult flies are still present, especially if flies are migrating into the field from other crops or wild hosts, additional treatments may be warranted at 7- to 10-day intervals until harvest is completed.
- Utilize effective sanitation practices and test for presence of larvae in fruit.

Source: Recommendations and certain other sections were sourced from University of California "Spotted-Wing Drosophila Pest Management Guidelines" and University of Maine "Spotted Wing Drosophila: Pest Biology and IPM Recommendations for Wild Blueberries."

Note, always:

- Use only one lure per trap.
- Count and record captures as recommended.
- Change trap as needed.
- Discard lures in trash far from the area of use and remove trash afterwards.
- Follow recommendations.
- Contact local extension authorities and consultants for regional advice.