

Spotted wing drosophila (*Drosophila suzukii*) biology and management in North Carolina blueberries

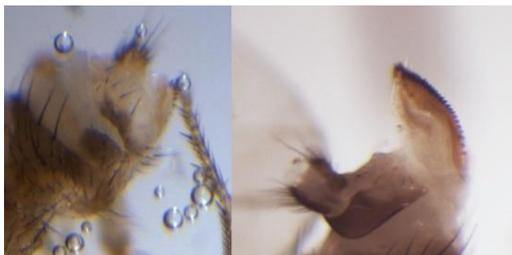


What is spotted wing drosophila (SWD)?

Spotted wing drosophila (*Drosophila suzukii*) is an invasive pest of soft skinned fruit which has been detected throughout the United States and worldwide in the last four years. Female SWD preferentially lay their eggs in ripe and ripening fruit, unlike nearly all other *Drosophila* species, which attack rotting fruit. The resulting larvae feed on the fruit, causing direct damage, and may also be present at harvest, contaminating the product. Crop losses in southeastern blueberries ranged have ranged from 1-15% annually.

How can I identify SWD?

Adult SWD are small (2-3 mm) light brown flies. Male SWD have a distinctive spot on the end of either wing and dark bristles in bands around the base of the last segment on their front legs (called sex combs). Female SWD lack spots on their wings but can be distinguished by a relatively large, blade-like ovipositor (egg laying devise) at the end of their abdomen.



Non SWD ovipositor (left) and SWD ovipositor (right). Note that these flies have been stored in ethanol. Normally, the ovipositor would be concealed just inside the abdomen.

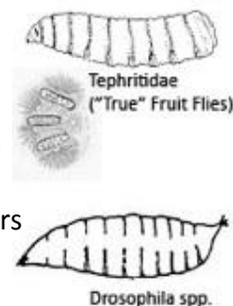


Non SWD wing (top) and male SWD wing (bottom). Not all small brown flies with spots on their wings are SWD. See here for links to images of non SWD flies which also have spots on their wings: <http://bit.ly/MfnKcy>

It is impossible to distinguish SWD larvae from other *Drosophila* species, so it is important that you only sample sound, otherwise marketable fruit. *Drosophila* larvae are up to 3 mm long, do not have legs or a clearly defined head, and are tapered on both ends. They have two dark “mouth hooks” at the front. It is possible that blueberry maggot or apple maggot larvae could be present in blueberries, but these “true fruit fly” (Tephritidae) larvae are larger than SWD and have a flat rear end.

How can I determine if SWD is present on my farm?

You can monitor adult SWD with traps baited with either apple cider vinegar or a yeast and sugar slurry. See here for a step by step trapping guide: <http://bit.ly/KSK1x5> However, both of these lures are inefficient compared to ripe fruit, so they should only be used to determine SWD presence or absence in an area. Growers, extension agents, and researchers have also monitoring SWD throughout the southeast, since 2010. SWD*VMN monitoring sites have been active in different years and may not be present in your area, but it is reasonable to assume that SWD are active in locations where they have previously been detected. You can find trap capture data at the SWD Volunteer Monitoring Network (SWD*VMN) site here: <http://bit.ly/MfsM9J>. Fruit should also be carefully monitored for SWD larvae. You can learn how to sample fruit here: <http://bit.ly/KNPJ4c>



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How do I manage SWD on my farm?

Ripening and ripe fruit are susceptible to SWD attack, but they do not appear to be attracted to unripe fruit. If adult SWD are present on your farm, aggressive management is warranted.

Aggressive management entails:

1. Excellent sanitation: Fruit should be harvested frequently and completely. Any unmarketable fruit should be removed from the field and either frozen, “baked” in clear plastic bags placed in the sun, or disposed of off site. This will either kill any larvae present or remove them from your farm.
2. Canopy and water management: Prune to maintain an open canopy. This may make plantings less attractive to SWD and will facilitate pesticide applications. Leaking drip lines should be repaired, and overhead irrigation should be minimized.
3. Insecticide treatments: treatments should be applied at least every seven days and repeated in the event of rain. Effective insecticides with pre harvest intervals amenable to picking schedules should be selected, and insecticide modes of action should be rotated between each treatment. See here for a list of the registered insecticides in NC blueberries and their likely efficacy against SWD: <http://bit.ly/WcPTSL>. Growers should be careful to avoid exceeding maximum applications per season, this may be particularly problematic for organic growers. There are some organic tools available for SWD, but they may be less persistent than conventional materials.
4. Regular fruit sampling: at least 100 fruit per block per harvest should be observed for infestation. See here for information on fruit sampling: <http://bit.ly/KNPJ4c>

Growers should communicate with their marketer or wholesaler before beginning a management program to ensure that pesticides registered for use in the United States are acceptable for all markets where their fruit is destined.

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