Timely Viticulture

"Timely Vit" is designed to give those in the Maryland grape industry a timely reminder on procedures or topics they should be considering in the vineyard.

- Dormant - Pre-Bloom - Bloom - Post Bloom - Mid Season - Pre-Harvest - Harvest - Post Harvest - Dormant

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The Spotted Wing Drosophila (SWD) Part 1—History, Background, and Damage

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History

The Spotted Wing Drosophila (SWD) is a small vinegar fly with the potential to damage many fruit crops, especially thin-skinned fruit. SWD, or *Drosophila suzukii*, is native to eastern Asia. Most species of vinegar flies attack overripe or damaged fruit. However, SWD is unique as the female can lay eggs in **healthy** fruit. SWD was first detected in the western United States, when an infestation of caneberries was reported in California in 2008. In 2011, SWD was found in the Mid Atlantic region. It has already become a major pest of many crops in Maryland, especially raspberries, blackberries, and cherries, and has caused damage to blueberries, grapes, and strawberries. The following is a brief summary of its background, life cycle, symptoms, and damage. For management considerations please see the Timely Viticulture: The Spotted Wing Drosophila (SWD)-Part 2: Management: http://extension.umd.edu/learn/spotted-wing-drosophila-swd-part-2-management

Figure 1. Adult male flies are 2-3 mm long and may be seen on the outside of fruit. (Photo by Martin Hauser)

Figure 2. The male SWD has one distinctive spot on each wing tip (females do not have the wing spots). (Photo by Gorak Arakelian)

Identification

- SWD progresses through four life stages: egg, larva, pupa, and adult. Depending on temperature, egg to adult development takes between 8-25 days.
- Eggs are milky white with two filamentous breathing structures and are around 0.02" long. Larvae are milky-white, cylindrical, and leg-less, ranging from 0.02 - 0.15" in length. Pupae are light brown and 0.11" long.
- Adults are 0.07-0.13" long and live about 3 to 9 weeks. They have red eyes, a light brown to yellowish-brown body, and black stripes on their abdomen.
- Males have a characteristic black spot on the tip of each wing (females do no have these spots - Figure 2).
- Females have a characteristic egg-laying structure called an ovipositor that is only visible under magnification (Figure 3).

Background and Life Cycle

- SWD is thought to primarily overwinter as an adult and becomes active in the northeast May though mid-June.

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Part 1—History, Background and Damage

Pre-Harvest

- Female SWD cut into INTACT fruit using their serrated ovipositor and inject 1-3 eggs per site under the skin of the fruit (Figure 3).
- Eggs hatch in 1-3 days, and larvae feed inside the fruit flesh before pupating. Pupation can occur inside or outside the fruit.

Symptoms and Damage

- SWD most commonly feeds upon cracked or damaged wine grapes. They may not produce a successful second generation on intact fruit, particularly in thick-skinned varieties.
- Other vinegar fly species can also cause similar symptoms in previously damaged grapes. The larvae cannot be distinguished from one another.
- As grapes ripen, skin penetration resistance decreases, and SWD are better able to oviposit in intact fruit. Skin penetration force of <40cN has been associated with SWD infestations.
- Initial signs of an infestation are subtle. The female's ovipositor leaves a small, pin-prick wound in the fruit flesh. This piercing of the fruit often leads to the development of secondary infections, including late season fruit rots.
- Within a few days, larval feeding causes fruit flesh to start breaking down, creating discolored regions, wrinkles, and eventual tissue collapse. Berries may take on a shriveled, shrunken appearance. By this point, the larvae are relatively large and easy to detect (Figure 4).
- Failing to detect an infestation in ripe fruit before harvest can affect fruit quality and marketability.
- Since grapes have many berries per cluster and are processed, some level of damage is acceptable before control tactics are necessary, as long as there is no significant increase in rot and final fruit quality is not affected.

Figure 3. Distinct double-row serrated ovipositor on the female SWD for piercing intact fruit. (Photo by Martin Hauser)

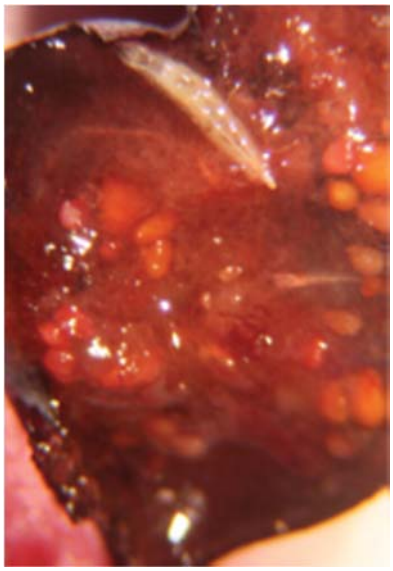

Figure 4. SWD larvae are white and visible against the darker fruit. (Photo by Tracy Hueppelsheuser)

More information on background and natural history are presented in the following factsheets posted by Penn State Extension:
http://pubs.cas.psu.edu/FreePubs/PDFs/ee0042.pdf
http://pubs.cas.psu.edu/FreePubs/PDFs/ee0043.pdf

References

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