



Spotted Wing Drosophila

August 2012

Background

Spotted Winged Drosophila (SWD), *Drosophila suzukii*, is an exotic insect pest closely related to vinegar flies and has recently been discovered in Wisconsin. It was first established in Hawaii during the 1980's, and was discovered in California in 2008. It quickly spread throughout the Pacific Northwest and Canada, and it was soon discovered in Florida in 2009. Midwestern detections include Michigan (September 2010) and two reports in Racine County, Wisconsin (October, 2010). Recently (August 2012), several infestations have been detected on raspberries and strawberries in Southwest Wisconsin. Several unconfirmed reports have also come from the Northwest and North central parts of the state. To keep current with ongoing developments, the University of Wisconsin Extension will provide **regular updates as necessary**.

Vinegar flies are part of a large group of insects which typically attack rotting or fermenting fruit, but will not damage healthy fruit. However, SWD is different! The SWD female has a serrated ovipositor which allows her to cut a slit into healthy fruit to lay eggs. Larvae will feed within healthy fruit tissue causing adjacent tissue to collapse within a few days; consequently crop loss may be severe.

Identification

SWD are very similar in size, shape and appearance to other vinegar flies. The adults are small, 1/16 to 1/8 in long (2-3 mm) with red eyes and a light brown thorax and abdomen. Larvae are small, legless, up to 1/8 inch long, cream colored and round in shape.

To distinguish adult SWD from other common vinegar flies, remember that male SWD have a single dark colored spot at the tip of each wing. Females do not have these spot on their wings. Males also have two dark colored bands on each foreleg. The only way to identify female SWD from other vinegar flies is by their serrated ovipositor. However this characteristic is only visible with magnification.

Life History

It is unknown how, or if, SWD can overwinter in Wisconsin. However, reintroduction could possibly come from migrants on storm fronts or on imported fruit. Because of its recent introduction into Wisconsin and our lack of experience, it is unclear how this insect will react under our environmental conditions. Thus, we must rely on information from other states.

SWD adults prefer moderate temperatures and can complete a generation in as little as 8-9 days. Adult females use their serrated ovipositor (egg laying device) to cut a slit into healthy fruit to deposit from one to three eggs. Several females may lay eggs on a single fruit. Eggs hatch in as little as 1-3 days and the larvae can complete feeding within several days depending on temperature. Adults may live for several weeks and females can lay several hundred eggs in their lifetime. Because of this short generation time, buildup of large number of adults may be possible.

Host Crops

SWD have a wide host range and prefer soft skinned fruit that includes blueberries, strawberries, raspberries, cherries, blackberries, grapes, peach, plum, tomatoes and melons. While apples are sometimes included on host lists, the potential for economic damage has not been completely determined. In areas of California where SWD, soft skinned fruit and apples exist in the same geographical area, damage to healthy apples has not been reported.

Damage Symptoms

Initial signs of infestation are small scars or slits left by the female's ovipositor. Soon after larval feeding begins the fruit begins to collapse. Secondary pathogens may also be introduced at the larval feeding sites which cause additional deterioration of the fruit.

Scouting and trapping

Trapping will be a valuable IPM technique that should be used for early detection and to monitor adult population trends. Traps are available commercially but are also simple and inexpensive to make. Simply use a large (approximately 16 oz), clear, plastic cup with lid and drill or melt ¼ inch holes around the top of the cup to allow adults to enter. Larger holes will allow larger insects to enter and make

counting SWD more difficult. Traps can be baited with either 1-2 inches of apple cider vinegar, or according to new Michigan State University research a yeast-sugar mix (1 Tbsp. active dry yeast: 4 Tbsp. sugar: 12 oz water). Michigan State Entomologist suggested leaving approximately 1/3 of the diameter of the cup without holes to facilitate replacing the apple cider vinegar bait. Yellow sticky cards can be hung from the inside of the lid and are used to help attract SWD and to prevent them from escaping. They are hung with a paperclip from the lid on the inside of the cup. Seal this hole with glue or silicone to prevent rain water from entering the traps and diluting the vinegar. More comprehensive directions can be found at Michigan State University's website; <http://www.ipm.msu.edu/SWD/SWD-monitor.htm>

Hang traps in the shaded plant canopy where fruit are present. For strawberries, this may be on the ground but in bush or tree fruit hang the trap within the plant canopy. Check traps and replace liquid bait on a weekly schedule. Do not pour bait out at the base of the trap as it will confuse the adults and reduce the effectiveness of the trap. A hand-lens will be useful for identifying male SWD and required for identifying female SWD.

Larvae may also be detected in fruit. Michigan State University researchers have determined the boiling method to be the most effective method to detect small and large larvae as well as pupae. Their method suggests boiling suspected berries in 150 milliliters (approx. 5-6 ounces) of water for one minute then crushing the berries over a 4 mesh screen with a spoon and then rinse the fruit under cold water with a dark tray underneath to collect the juice and larvae. The dark tray should facilitate detection of larvae. Another sampling method includes placing fruit in a Ziploc-type bag, slightly crush the fruit then add a sugar water solution (1/4 cup sugar/ 4 cups water). Dislodged larvae will float, backlighting the bag can help in detection.

Management

Minimize the buildup of SWD by removing native, wild hosts such as blackberries, plums, apples and grapes, if practical, and promote timely harvest. Removing fruit that has ripened prematurely or is infested with SWD can be helpful.

Use traps to determine when adults are present and treat using insecticides if the crop is at a susceptible stage. Specific insecticide recommendations have not been developed for Wisconsin. Choose an insecticide that is labeled for the fruit you want to protect. Products that are effective for other fruit flies are likely to be effective for SWD. Be careful to choose a product which meets your Pre-harvest Interval (PHI). Always read and follow label instructions carefully. Additional management information can be found on at the Michigan State University website

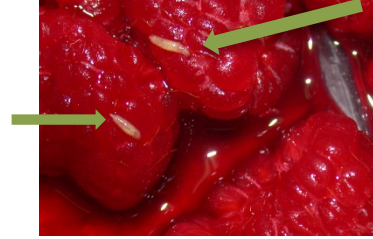
<http://www.ipm.msu.edu/SWD.htm>

For more information regarding insect management on apples, contact Bryan Jensen, bmjense1@wisc.edu, 608-263-4073, for information regarding this pest on grapes and cranberries, contact Chris Williamson, rcwilliamson@wisc.edu, 608-262-4608. Or, contact your local UW Extension county agent/educator



Adult Male Spotted Wing Drosophila.

Photo Credit: Clarissa Hammond, Wisconsin Department of Agriculture, Trade and Consumer Protection



SWD larvae.

Photo Credit: Phil Pellitteri, UW Dept. of Entomology



Female, serrated ovipositor.

Photo Credit : Martin Hauser, CDFA



Egg laying scars on Cherry.

Photo Credit: Martin Hauser, CDFA



Insect trap.

Photo Credit: Roger Schmidt, UW-Madison Integrated Pest Management Program



Close-up of trap, showing entry holes.

Photo Credit: Roger Schmidt, UW-Madison Integrated Pest Management Program