

# Current Recommendations for Managing Spotted Wing Drosophila (SWD), *Drosophila suzukii*, in PNW Strawberries\* (Revised May 26, 2011)

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## Integrated Management of SWD in Strawberries:

- Monitor fields and surrounding area with baited traps (see below).
- Once the fruit begins to color and SWD is detected in traps, treat crop with effective registered insecticides posted on central SWD website (See labels for most up-to-date information):  
[http://swd.hort.oregonstate.edu/files/webfm/editor/Strawberry\\_SWD\\_Pesticides\\_for\\_OR\\_and\\_WA\\_4-21-11.pdf](http://swd.hort.oregonstate.edu/files/webfm/editor/Strawberry_SWD_Pesticides_for_OR_and_WA_4-21-11.pdf)  
or see the Washington site, <http://www.mountvernon.wsu.edu/ENTOMOLOGY/main/index.html>

Rotate chemistries with different resistance management groups.

- Evaluate your management program and time follow-up treatments by monitoring for flies with traps.
- Sample fruit for larval infestation using the salt extraction method listed below.
- Destroy leftover fruit on the plant or fruit that falls on the ground when practical, to reduce fly's breeding sites and food supply.
- A post-harvest clean-up spray to reduce SWD populations is not recommended.
- \*Stay informed. The following recommendations are subject to change based upon updated information. Follow the SWD website: <http://swd.hort.oregonstate.edu/>



## Monitoring Traps:

Use a 16 to 32 oz cup or clear 1 quart deli container with several (7-10) 1/8 to 3/16-inch holes drilled or punched around the cup for fly entry. Leave a 3-inch pour space on the side of the container for pouring out vinegar. Add ≈1 to 1 1/2 inches of pure apple cider vinegar (real not artificially-flavored), 1-2 drops of unscented liquid dish soap, and snap

the lid in place. Place trap on the ground or elevated slightly above canopy (e.g., with the aid of a PCV pipe) within the strawberry row. Entrance holes should be clear of leaves and fruit to allow easy entry by flies. Check trap contents for flies and replace vinegar weekly. Don't pour the spent vinegar on the ground; remove it and dispose elsewhere.

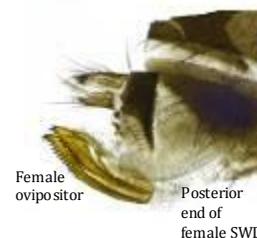


Male  
SWD

Trap contents can be filtered over a fine screen or colander then dumped into a white tray with a small amount of water and examined with the naked eye or with a 10x-14x hand lens for easy viewing of SWD flies. See identification guide on SWD website for *D. suzukii* prepared by Oregon Dept. of Agriculture at:

[http://swd.hort.oregonstate.edu/files/webfm/editor/ID\\_D\\_suzukii\\_060210\\_sm.pdf](http://swd.hort.oregonstate.edu/files/webfm/editor/ID_D_suzukii_060210_sm.pdf)

Female SWD are more difficult to distinguish than males and require magnification to see the ovipositor (egg-laying appendage). Several non-economic vinegar flies possess more rounded ovipositors and may be easily mistaken for SWD. Only report male flies found in the trap, unless female flies are confirmed by a specialist. Search for male SWD (one spot on distal portion of each wing). These are readily apparent with the naked eye or when viewed with a magnifier.



Female  
ovipositor

Posterior  
end of  
female SWD

## Larval Extraction from Fruit:

Collect suspect fruit (e.g., oviposition scars, soft and bruised spots) to check if fruit are infested with SWD larvae. A salt solution will irritate the larvae causing them to wiggle out of holes in the fruit.

Prepare a salt-water solution as instructed below:

**Salt-Water** solution: dissolve 1/4 cup plain salt in 4 cups warm water.

- Place fruit in a shallow white pan and cover with salt solution.
- Observe the fruit closely for at least 10-15 minutes to see larvae exiting fruit out of egg-laying holes.
- Detection of small larvae may require the use of a hand lens and good lighting. Count as quickly as possible while they are still alive and moving.



## Chemical Control:

Choice of effective insecticides is listed on the SWD website:

[http://swd.hort.oregonstate.edu/files/webfm/editor/Strawberry SWD pesticides for OR and WA 4-21-11.pdf](http://swd.hort.oregonstate.edu/files/webfm/editor/Strawberry_SWD_pesticides_for_OR_and_WA_4-21-11.pdf).

Fruit appears to be susceptible from first blush of color through harvest. Field tests performed in the Pacific Northwest in 2010 suggest that the organophosphate (Malathion®) and pyrethroid (Brigade®) will provide approximately 7-10 days of control, while Radiant® (spinetoram) will provide 5-7 days of control.

Pesticide results from laboratory trial data in 2010 can be found at:

[http://swd.hort.oregonstate.edu/files/webfm/editor/SWD\\_Pesticide\\_Update\\_June\\_2010.pdf](http://swd.hort.oregonstate.edu/files/webfm/editor/SWD_Pesticide_Update_June_2010.pdf) or

Mount Vernon WA site: <http://www.mountvernon.wsu.edu/ENTOMOLOGY/main/index.html>

Entrust® (Spinosad) is the only organic product with residual activity (5-7 days control). While it doesn't appear to provide residual control, Pyganic® applied at 5 day intervals at the high labeled rate has shown to reduce SWD populations in California. Water volumes of 40 to 100 gpa for these foliar applications are common and dependent on plant size and amount of canopy foliage present. Consider REIs, PHIs, MRLs, surface water and buffers, and safety to pollinators and other beneficial arthropods when selecting a product. Remember to rotate classes of insecticides to delay possible development of insecticide resistance. To address pollinator safety, make early morning or late evening applications of all products. Refer to PNW591 (<http://extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf>) for more detailed information on how to reduce bee poisoning from pesticides.

**Sanitation Practices:** Consider including sanitation or clean-up practices in your management program, when practical. Destroy leftover fruit on the plant to reduce fly's breeding sites and food supply. This will prevent SWD from utilizing the fruit. Properly dispose of and/or destroy infested fruit that falls on the ground. Various sanitation methods were tested in 2010 and will continue in 2011. Two sanitation methods proven to be the most consistent and efficacious in killing SWD larvae in fruit are:

- **Solarizing:** Tightly seal 1-2 mil clear plastic sheeting over fruit in sunny location, *or*
- **Bagging:** Place infested fruit in a clear or black plastic bag and seal.

**Other Considerations:** A higher number of SWD females compared to male flies were captured in traps early in the season of 2010. Therefore counting only males may result in false negatives and failure to treat for SWD when they may actually be present. Track SWD numbers in your area by following the statewide monitoring and mapping program: <http://berrygrape.org/maps/or-county-map/>. Both male and female flies are being recorded at this site. Another suggestion to deal with SWD is to apply your first spray for weevils (if present) using a material recommended to control both weevil adults and SWD. The intent is to control both these pests concurrently while hopefully eliminating SWD within the berry planting during that first spray. The same can be said for spray applications intended to control other insect pests as well.