

Ask Tom January 2013: Spotted Wing Drosophila

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ORGANIC GROWERS SCHOOL NEWSLETTER

Tom –

I have heard talk about a new fruit fly that is a problem for berry growers. What organic practices are available to manage that pest?

– Perplexed in Licksillet

Dear Perplexed –

It is called the spotted wing drosophila (SWD) and is similar to our traditional fruit flies, which are attracted to overripe fruit.

An important difference is that the SWD will consume and is able to lay its eggs in sound and ripe fruit. They are able to do this because of the females' large, blade-like ovipositor (egg-laying device). Berries can look fine at harvest but may contain larvae (aka maggots) when the customer gets them home.

Alternatively, SWD can hatch in the clamshell container. Often they fly when berries are placed in the refrigerator because the maggots will leave the fruit in search of warmer temperatures. As you might expect neither of these outcomes is good for return sales.



This new pest was first seen in NC about three years ago. Research is underway on management strategies but some recommendations are emerging that organic growers can use to minimize the damage on their farm.

Which Fruit are at Risk?

In the literature the fruit most often mentioned are raspberries, blackberries, strawberries, blueberries, cherries, plums, peaches, and occasionally on damaged tomatoes. In North

Carolina, SWD has been found in raspberries, blackberries, strawberries and blueberries. Larger fruit can be affected but most often those infestations have been associated with damaged fruit.

How do we monitor and identify SWD?

Apple cider vinegar lure traps are most often recommended. Traps are used only for monitoring the timing of the appearance of SWD and are not effective as a management strategy. Here are plans for a simple trap using plastic drink cups:



http://www.vegedge.umn.edu/SWD/SWD%20FINAL_Monitoring_Trap.pdf

Some believe a yeast solution is more effective. This link offers a recipe at the bottom:

<http://www.mofga.org/Publications/MaineOrganicFarmerGardener/Spring2012/Drosophila/tabid/2140/Default.aspx>

Hundreds of species of fruit fly exist, so we need to know which ones are SWD. There are two distinguishing features of the SWD for identification. The first is the male SWD have two distinctive spots on the end of each wing. The second is the female SWD's large, blade-like ovipositor. This ID card seems fairly useful to me: http://www.ipm.ucdavis.edu/PDF/PMG/SWD_IDCard.pdf

The photo above might also be helpful. With a hand lens or for those with particularly good near vision, the large red eyes are a tipoff but look for the other features too until you are accustomed to telling these tiny critters apart.

What cultural practices help?

I consulted local berry grower Walter Harrill and NCSU Extension Agent Sue Colucci and here are their suggestions plus other NCSU suggestions from Dr. Hannah Burrack:

1. Use vinegar traps and monitor for the arrival of SWD in order to guide spray programs.
2. Harvest early and often even to the point of picking some slightly unripe fruit.
3. Collect cull fruit and disinfect them with extreme heat or cold such as sealed plastic bags left in the bright sunshine for several days or placed in the freezer. Burying and composting are not reliable ways to destroy eggs and larvae.
4. Keep plants and fields dry by using drip irrigation and keeping leaks maintained. Avoid any puddles or standing water in the field because SWD seem to be attracted to these areas.
5. Consider value-added crops as an alternate to marketing fresh fruit and freeze them promptly after harvests to keep any SWD eggs from developing.
6. Change crops. (This comment from Walt was in jest but worth considering,)

Bug zappers do not appear to work and no pheromone mating disruption systems have been developed at this time.

Sue emphasizes that monitoring is very important. We tend to trap SWD all year, yet we have not seen problems in early crops- like strawberries. Growers should set traps in all potential crops.

What organic sprays are effective?

Entrust is the organic control that is reported to be most effective. Even prohibited material controls are starting to show reduced effect so an integrated approach is probably important. The life cycle for fruit flies is so short that frequent sprays may be needed. Some growers report problems with the appearance of the fruit after spraying. NCSU spray recommendations are on the table at this link.

https://docs.google.com/file/d/oB9kLmv3HSf_uYjNiZTBiZGUtYzNhNyooMzFILTk5YTktMWJlMTVvMDUoOWFj/edit?hl=en&pli=1

That table rates organic controls as follows:

| Control Material | Rating |
|-------------------------|---------------|
| Spinosad (Entrust) | Good |
| Pyrethrin (Pyganic) | Fair |
| Stylect Oil | Poor |
| Insecticidal soap | Poor |

None is rated as excellent in the NCSU analysis.

The **Washington State recommendation** for Entrust rates and rotation timing on cherries

| Week | oz/acre |
|-----------------|----------------|
| 1 | 1.25 |
| 2 | 1.25 |
| 3 | 2 (Pyganic) |
| 4 | 2 |
| 5 | 2.5 (Pyganic) |
| total oz | 9 |

Pyganic is added to avoid exceeding the label limits for Entrust. Check this source for more detail: <http://extension.wsu.edu/swd/Documents/SWDrecommendations2011.pdf>

Regarding the amount of Entrust to use WSU offers that “while the 2(ee) label for Entrust give 1.25 oz/acre as the lowest rate, preliminary bioassay data indicates a distinct drop in efficacy

between 2 and 1 oz (2 and 3 oz both provided 100% mortality of females, whereas 1 oz caused only 50%).”

California Extension Recommendation for Organic Growers

“Contact your certifiers early in the year to make sure they will approve the use of spinosad (Entrust), pyrethrin (Pyganic 5.0) and/or azadirachtin (Aza-Direct) if SWD begins to cause damage. Pyganic 5.0 contains pyrethrins—a botanical insecticide derived from chrysanthemums. Entrust is the organic formulation of spinosad. Aza-Direct is azadirachtin which is a type of Neem product and used as a botanical antifeedant, repellent and insect growth regulator. Generally the organically approved products are not as effective as the other (non-organic) products previously mentioned, but can suppress fly populations and are important tools for organic producers. Recent studies in control of SWD in organic raspberries by Mark Bolda (UCCE Santa Cruz) showed differences in the number of SWD larvae in fruit treated with Pyganic 5.0 @ 18 oz. and Entrust @ 2 oz. compared to an untreated control. Bolda also looked at Pyganic 5.0 @ 18 oz. combined with Aza-Direct @ 2 pt. and this treatment provided similar control as that of the Pyganic 5.0 @ 18oz. alone. Pyganic 5.0 @ 9 oz. did not provide control in Bolda’s study. Interestingly, in Bolda’s work, treatment differences can not be seen when measuring adult fly populations (he uses a D-vac to vacuum up adult flies)—only when measuring maggots inside fruit. Other organic products such as GF-120 and a variety of oils are reportedly not very effective. It is also just as important to remember that Entrust and other organic products, as with conventional materials, should not be over-used in efforts to prevent resistance development. Entrust has a pre-harvest interval of three days in blueberries. Check the labels for PHI for other materials in other crops.”

Source: <http://ucanr.org/sites/csnce/files/59560.pdf>

Cornell Recommendations including Entrust and Pyganic are at:<http://hudsonvf.cce.cornell.edu/scouting%20reports/scouting%20data/2012%20Pest%20Alert%20Spotted%20Wing%20Drosophila%207-12-12.pdf>

As if we needed one more pest to manage mid-season. SWD is a recently arrived pest and control research is underway. Stay in touch with Extension for the latest developments.

Good luck and happy spraying.

– Tom

Other Resources:

NCSU Fact

Sheets:<http://henderson.ces.ncsu.edu/files/library/45/Spotted%20Wing%20Drosophila%202011.doc>

https://docs.google.com/viewer?pid=explorer&srcid=OB9kLmv3HSf_uZnFuRTFRa2l4RWc&chrome=false&docid=b8678459772e2691c37e25c4fbdb5539%7Co4e8cb00e144caf7224320418f7d8c4a&a=bi&pagenumber=1&w=563

Map of counties affected so far: <http://www.eddmaps.org/Project/project.cfm?proj=9>