

**SPOTTED WING DROSOPHILA:
PREVENTION TOOLS ARE UNDERWAY**

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Spotted wing Drosophila, *Drosophila suzukii* (Diptera: Drosophilidae; SWD), an invasive pest of berry and stone fruits, is now found in 27 states and a larger threat in several European countries. This vinegar fly prefers ripe fruit, as opposed to overripe and fallen fruit that are infested by most of the other *Drosophila* species. For this reason, harvesting fruit in a timely manner is important to avoid oviposition. Greater adoption of prevention-oriented IPM practices (e.g., timely harvesting, sanitation, cold storage) will increase opportunities for growers to widen their options for managing SWD.

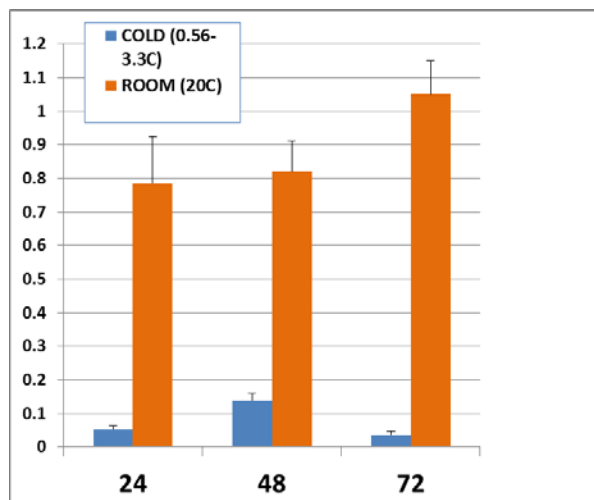
It has been found that Oregon's fruit crops are at more of a risk during mid to late season, if not controlled with chemicals. SWD moves from one fruit crop to another as the season progresses and populations build up in the mid-Willamette valley to higher numbers by August, and exponentially increases during the October to December months after most commercial fruit are harvested as detected in monitoring traps (figure). The first deeper winter freeze greatly reduced the population. Fall-emerging flies (September - October) can overwinter. These overwintering flies go through a reproductive diapause and will lay eggs the following spring/summer on early ripening fruit. It is still unknown where exactly SWD overwinter and how well this pest will overwinter under various environmental conditions throughout Oregon. There is great potential for continual re-introductions, whether they survive the winter or not.

Management

There are a team of Oregon, California, Washington, and Canadian researchers addressing such questions as SWD overwintering capability, behavior, phenology, effects of temperature, and influences from the landscape. With this new knowledge, management strategies and control recommendations are being developed as new data is being presented. Monitoring trap designs and attractive baits for more sensitive detection of SWD throughout a season; and as a means of controlling the pest are being investigated further. In 2010 and 2011, many of the researchers used 1 ½-inch of 5% apple cider vinegar (ACV) in a 32 oz cup with ten,

3/16-inch holes punched around sides, serviced weekly. However, yeast mixture (1 package of Brewer's yeast, 4 teaspoons of sugar and 12 oz of water) was used in traps and compared to ACV at a no-spray blueberry farm. The yeast mixture significantly attracted more flies than apple cider vinegar during most parts of the year, but had its limitations (smelly, not as specific to SWD, less of a preservative for flies).

Cultural and preventative practices such as sanitation techniques (to reduce the fly's breeding sites) and cold storage treatments in conventional, IPM, and organic fruit systems will be presented in this paper. Post-harvest treatment options are limited. Preliminary data on cold treatments of infested blueberries showed promising results that slowed development, reduced survival of SWD inside the fruit and maintained quality. Growers in the Willamette Valley began observing that when they placed freshly-picked fruit in cold storage



after picking, they saw less of a SWD problem. Thereafter, preliminary studies were initiated by OSU-USDA in the fall of 2011 on susceptible late-season blueberries, 'Aurora' and 'Elliott.' Batches of 105-170 berries infested with SWD eggs or young/old mature larvae were placed in a grower's cold storage chamber with temperatures ranging from 34-38°F for exposure periods of 24, 48 and 72 hr. Treatments were replicated 4 times per exposure period. Results were promising, not only were there less larvae, but development of the larvae was reduced. Reductions in survival of younger (figure) and older larvae ranged from 83-97% and 34-59%, respectively.

Sanitation is also a necessary and key management tool to prevent the spread and build-up of SWD populations. Use of sanitation practices often makes suppression strategies unnecessary. Small-scale field studies were performed in 2010 and 2011 utilizing bagging, crushing, burying, solarizing, and leaving infested fruit on the ground. Clear and black bagging killed a good percentage of larvae without escape from the bag. Solarization (1-2ml clear plastic over fruit) was an effective method, however when testing any of the sanitation methods during increased precipitation and cooler temperature periods, a higher percentage of larvae survived.