WASHINGTON STATE UNIVERSITY EXTENSION

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FOR IMMEDIATE RELEASE

SPOTTED WING DROSOPHILA COULD POSE THREAT FOR WASHINGTON FRUIT GROWERS

Pest with a Taste for Soft Fruits Moves North from California into Oregon and Washington—Regional Research and Extension Effort Proposed

Spotted wing drosophila, *Drosophila suzukii,* was introduced into California in 2008 and has rapidly established populations along the Pacific Coast. There have now been confirmed infestations of the fly in the Willamette Valley, detections in Hood River, Oregon, and detections throughout western Washington, in locations including Bothel, Olympia, Puyallup, Seattle, Stevenson, Vashon Island, and Mount Vernon. Spotted wing drosophila (SWD) are documented pests on soft-skinned fruits including cherry, raspberry, blackberry, blueberry, strawberry, plums, pluots, nectarines, and, and recent evidence indicates that they may feed on wine grapes. Western Washington entomologists have observed SWD throughout the fall in association with Himalayan Blackberry and Evergreen Blackberry *Rubus armeniacus* (syn. *Rubus discolor*) and *Rubus laciniatus.* Both of these old-world blackberry species are well established throughout western Washington and anecdotally are serving as a preferred host for SWD.

Figure 1 - Adult female. (Photo by M. Hauser, UCIPM)

Figure 2 - Adult male; note dark spots on wing tips. (Photo by M. Hauser, UCIPM)

Adult SWD are small (2-3 mm) flies with red eyes and a pale brown thorax and abdomen. They have black stripes on the abdomen and males have a distinguishing black spot toward the tip of each wing. SWD larvae are tiny (up to 3.5 mm), white, and cylindrical (photo, p. 3).

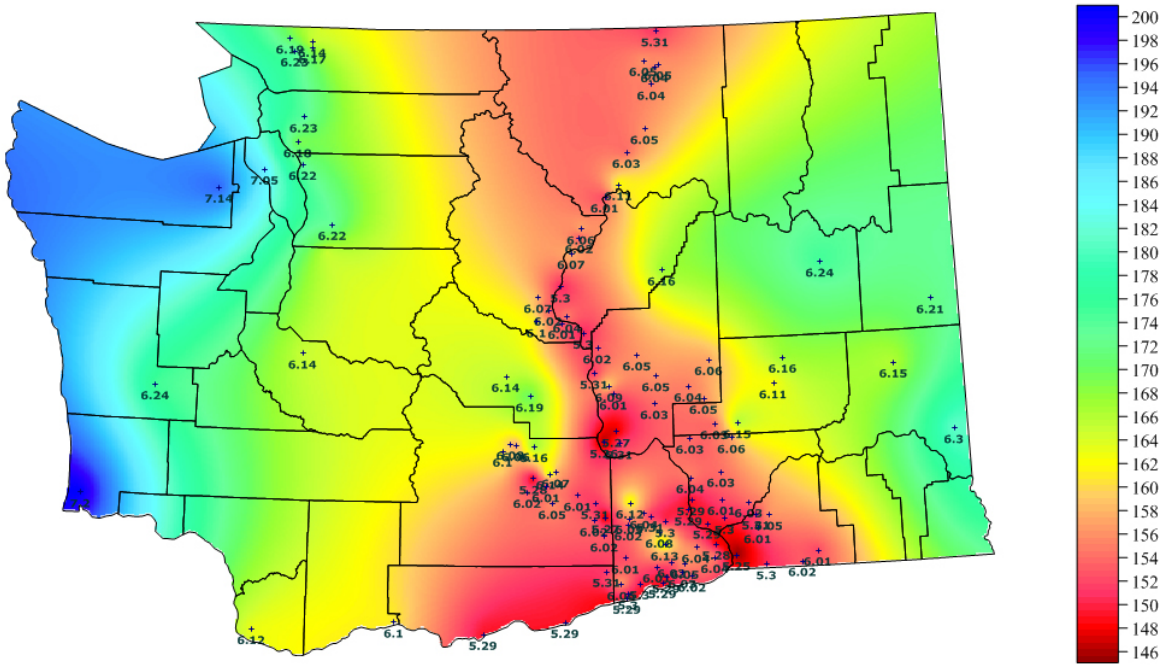
SWD is a "vinegar fly" such as *Drosophila melanogaster* or *D. similans* but while most vinegar flies attack rotting or fermenting fruit, the new drosophila readily attacks undamaged fruit as well as rotting fruit. SWD literally gets a developmental jump start on its sibling species. There is also a resemblance to the western cherry fruit fly (WCFF) *Rhagoletis indifferens.* Indeed, early detections in California misidentified maggots in cherries as WCFF, but the WCFF adults are much larger (5 mm) and have dark bands on their wings.

It is SWD's propensity for attacking healthy ripening fruit that makes the pest particularly onerous. The female has a very large, serrated ovipositor, so it is able to penetrate the skin of soft-skinned fruit, laying its eggs just under the skin and leaving a small depression or "sting" on the fruit's surface. Each clutch of eggs numbers from one to three, and the female will oviposit on many fruit. Multiple clutches of larvae are quite possible on the same fruit because many females may visit the same piece of fruit. Eggs hatch and the larvae/maggots develop and feed inside the fruit before they exit to pupate. This feeding damage creates brown, soft, sunken areas on the fruit, compromising its marketability and creating opportunity for other pests such as more common, rotten-fruit-feeding flies and for infection by fungal and bacterial disease pathogens.

Figure 3 - Oviposition scars on fruit. (Photo by M. Hauser, UCIPM)

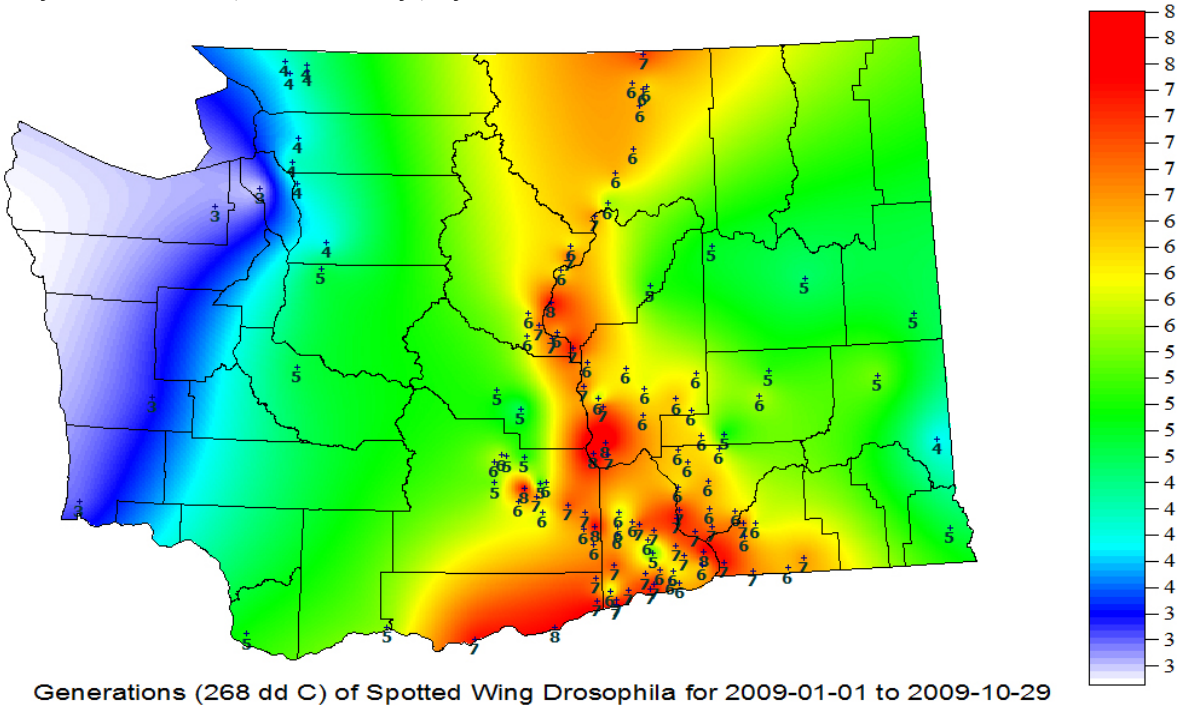
SWD poses an imminent threat to growers and home gardeners in Western Washington. How well SWD is adapted to the major tree fruit producing regions of the Columbia Basin is as of yet undetermined, but researchers in association with the WSU AgWeatherNet service have calculated temperature patterns across the state and simple projections can be made based on what is known about SWD's life cycle and experiences in California.

Calculated phenology models predict 268 degree days (single sine with a horizontal cutoff of 9.1°C) for adult emergence. Based on 2009 temperatures, that would have the first generation of adult SWD emerging between late May and early June in most parts of the state. The map below shows the date (indicated within the map as "Month.Day," e.g., "6.05" = June 5) and Julian day (indicated by color bar at right and colors within map) at which 268 degree days would have accumulated.



Date and Julian day of when 268 degree days is reached for 2009

Like most vinegar flies, SWD has a short life cycle. Once the temperature has been achieved for an initial generation, subsequent generations can emerge in as little as one week or can take several weeks. In California, SWD can produce as many as 10 to 13 generations per year. Calculations in Washington, as illustrated in the map below, would indicate from 3 to 8 generations could have emerged, based on temperature, from January 1 through October 28, 2009. (Calculations were based on 9.1 °C or 48.38 °F as the lower threshold.) Note that this theoretical calculation does not factor in the fact that male SWDs become sterile at 30 °C (86 °F), or that SWD prefers high humidity, making the warmer and drier areas of the state somewhat less likely to incur damage than the map would indicate. Indeed, it is anticipated that growers in western Washington, where many of the soft-skinned, small fruits are grown, will have the biggest problem with SWD for a variety of reasons. These areas can anticipate up to 5 or 6 generations of SWD per year, with first emergence likely between mid-June and early July.



Generations (268 dd C) of Spotted Wing Drosophila for 2009-01-01 to 2009-10-29

A management program has not been determined for this prospective pest. A successful integrated pest management strategy will need to focus on reducing breeding sites and controlling flies before they lay eggs. Once maggots emerge within the fruit, there are no available controls. SWD can be monitored with a variety of traps and research is underway to determine the most suitable and uniform method for sampling. Growers can make their production sites less attractive to SWD by removing ripe and overripe fruit. Indeed, sanitation is proving to be a key component of the IPM system that is evolving on caneberries in California. Fruit removal and heavy pruning of canes in fall has helped reduce the population abundance of flies.

A Regional Research and Extension Approach

A regional research and Extension program is currently being developed to address SWD. These efforts will culminate in submission of a USDA Specialty Crop Research Initiative (SCRI) proposal, in which Washington State is cooperating with the University of California and Oregon State University. Dr. Vaughn Walton, an Entomologist with the Department of Horticulture at Oregon State University, will be taking the lead on this proposal and will be serving as the Principal

Investigator. The Request for Applications for the SCRI program was released on November 2, 2009 and the due date for submissions is January 17, 2010. Oregon State will require all input from Washington State University on or before December 29, 2009.

A brainstorming session was held November 2, 2009 on the University of California campus at Davis. Three workgroups have been formed to begin addressing an IPM strategy on a regional basis. These include:

- Pesticide Evaluation
- Management Guidelines/Communications/Industry and Urban
- Monitoring/Fruit Evaluation/Phenology/Biology/Biological Control

A primary purpose for this announcement is to identify key WSU personnel who are concerned about SWD and would like to participate in these workgroups and in the submission of the USDA SCRI research and Extension proposal.

Some research efforts are already underway at WSU.

Dr. Lynell Tanigoshi, the Entomologist at WSU Mount Vernon, is currently conducting laboratory bioassays with registered and candidate insecticides to generate some initial insecticide recommendations. In spring as SWD emerges Tanigoshi is prepared to expand his efforts out to the field with insecticide efficacy studies in grower collaborator fields.

Dr. Tom Walters, a Horticulturist at WSU Mount Vernon, plans to collaborate with Tanigoshi to determine when soft fruits like caneberries and blueberries become susceptible to oviposition by SWD females.

Dr. Carol Miles at WSU Mount Vernon has blocks of organic grapes and other crops at her disposal and she plans to help organic producers in their efforts to manage SWD.

Carrie Foss, the Urban Integrated Pest Management Specialist at WSU Vancouver, has added SWD to the WSU Hortsense website and will be conducting outreach and information to professional landscapers and home gardeners.

Extension Educators Dr. Mike Bush and Marianne Ophardt have received funding to monitor western cherry fruit fly populations in the urban and suburban areas of Yakima and the Tri-Cities. If provided with some additional resources, they have agreed to piggyback monitoring SWD into their planned efforts in spring and summer 2010.

Extension educators in western Washington have been kept apprised of the emerging situation of SWD through routine communications distributed by Extension District Director Dr. Jim Kropft.

Dr. Doug Walsh, the WSU Integrated Pest Management Coordinator has been actively participating in the regional discussions with the University of California and Oregon State University. Walsh will assist in Extension outreach for the WSU faculty and staff involved with SWD. He will be submitting funding requests to the Western IPM Center and the National Institute of Food and Agriculture Extension IPM program for the resources to provide this Extension and outreach support. Walsh will also be keeping a wary eye out for SWD in the Columbia Basin in spring 2010.

Parties interested in participating on the USDA SCRI proposal or other SWD-related projects should please contact State IPM Coordinator Doug Walsh at dwalsh@wsu.edu.