

Spotted Wing Drosophila control on Sweet Cherry Recommendations for Eastern Washington for 2011 April 13, 2011

Spotted wing drosophila (SWD) is a new pest of cherries in eastern Washington, and growers should be aware that their pest management programs will need to change in order to control this new pest. It was found for the first time in 2010 (although it may have been present before then); now there is ample evidence that it occurs in every fruit-growing region from the Canadian border to the Tri-Cities. The 2010 trapping data showed some regional differences in pressure, but growers should not count on this for 2011; it may be many years before we understand these patterns. A trapping program of similar magnitude covering the eastern Washington fruit growing region will be conducted in 2011. Growers and fieldmen may hang their own traps, or use the trapping program to obtain information (see <http://extension.wsu.edu/swd/>).

Do NOT assume that if SWD was absent or present only in low numbers in your area in 2010 that the same will be true in 2011.

Conventional Cherries: The recommendations for 2011 are based on the trapping program in 2010, and from pesticide control information from Oregon and California. They are based on our best knowledge at this time, but are subject to change as we learn more. Updates will be posted on WSU's SWD website, <http://extension.wsu.edu/swd/>, along with a wealth of background information.

There are several assumptions implicit in these recommendations:

- Regardless of presumed high overwintering mortality, SWD is established in eastern Washington and will be back every year.
- Heavy overwintering mortality will cause a similar pattern of abundance that we saw in 2010: low numbers early in the season, with a large buildup later in the fall.
- Even if cultivars are found to differ in their susceptibility, but we will protect all cultivars equally
- Fruit becomes susceptible to SWD damage around the blush or pink stage and becomes more susceptible as harvest approaches
- Later-harvested cultivars and later-harvesting districts will be at greater risk from SWD than earlier-harvesting districts (because SWD populations will increase throughout the summer).

Crop protection measure for SWD should begin as soon as two conditions are met:

1. The crop is susceptible (blush or pink stage)
2. SWD has been identified in traps in your region

Until we have a better understanding of what trap catch means, we are NOT recommending that you use the traps as an indicator of the need to spray on a block-by-block basis. Once trap catch has occurred in a region, it is likely present throughout that region. **The first trap catch for each region will be posted on the SWD website** <http://extension.wsu.edu/swd/>; you may also sign up for email notifications on the website itself or by emailing Tim Smith (smithtj@wsu.edu).

SWD control can be integrated into the cherry fruit fly (CFF) control program, in terms of timing of sprays and period of coverage. CFF programs normally begin at straw color, and continue every 7-10 days through harvest. You can start the season with your normal CFF sprays until the first SWD is found in your area (and cherries have reached blush/pink), then alter your choice of pesticide to make sure SWD is controlled.

Materials that control SWD will control CFF, but the reverse is NOT true – in particular, **do NOT rely on GF-120 alone for SWD control**. The neonicotinoids have some systemic effect on SWD in the fruit, but do prevent adults from ovipositing. However, there may be some benefit to adding a material such as imidacloprid (Provado, Pasada) to SWD protective sprays, especially if the interval between sprays has been lengthened (because of weather or other application problems). The addition of imidicloprid may kill any eggs or larvae that slipped through the protective sprays (see MRL Issues below).

Once SWD spray protection has begun, continue spraying every **7-10 days** until harvest (observing the minimum re-treatment interval for the material you are using; see Table below). Until we have more information on pesticide efficacy, use the full label rates. As always, the materials sprayed close to harvest must be chosen on the basis of their preharvest interval (see MRL Issues below). The choice of protective sprays during this period include:

- organophosphates (such as diazinon, or malathion ULV)
- spinosyns (Success, Entrust, or Delegate)
- pyrethroids (Danitol or Warrior) (see MRL Issues below)

While resistance management is not the highest priority for SWD control for 2011, consider rotation of materials among these different classes to the extent possible. See the table below for PHIs, REIs, and the maximum number of applications/season.

Relatively few materials effective on SWD have a very short (1-3 day) preharvest interval (PHI). Malathion EC formulations applied by ground have a 3-day PHI, but can cause considerable phytotoxicity, and therefore are not recommended. Dimethoate can also cause phytotoxicity, and is not recommended for preharvest use for that reason; some foliar damage postharvest is usually considered acceptable. Malathion ULV applied by air has a 1-day PHI, and has been shown to be a viable technique for SWD control. In areas where aerial application is not an option (close to dwellings), a short PHI pyrethroid such as Danitol (3 days) is a possible substitute (see MRL Issues below). There are a few other materials with short PHIs (e.g., permethrin and carbaryl) but tests to date indicate these materials are not as effective against SWD.

If harvest in a given block extends over a long period (e.g., 10 days), you may need to reapply a protective spray during the harvest period. Malathion ULV is likely the only candidate material for this. If GF-120 is applied during harvest, it will provide protection against CFF, but not SWD.

MRL Issues. Pesticide residues are a significant concern in cherries for export. MRLs can and do vary by country of export for each pesticide. Work with your packinghouse to choose a SWD spray program most compatible with the fruit's destination. The cherry MRL table on the Northwest Horticultural Council's website may also be helpful:

<http://www.nwhort.org/CherryMRLs.html>. See also the USDA/FAS website: www.mrlatabase.com.

Postharvest Sprays. Preliminary tests indicate that both dimethoate and Provado kill eggs and/or larvae in fruit on the tree; dimethoate was the stronger of the two materials. If you normally apply a post-harvest clean-up spray for cherry fruit fly with either of these insecticides, you can expect an additional benefit to SWD control. It is doubtful if post-harvest sprays will provide a long-term clean-up for SWD that will carry over to the following year; there are too many other hosts. However, an argument can be made for a postharvest spray if a significant amount of fruit is left in the orchard, and there are vulnerable unharvested crops nearby (other stone fruits, blueberries, or caneberries). The concept of sanitation (whether through pesticides or physical means) has not yet been demonstrated to be of value in commercial production, although research is ongoing.

Organic Cherries. SWD control in organic cherries may be challenging. Entrust is one of the few effective materials that is registered for use in organic orchards; PyGanic may provide some knock down, but residual is likely non-existent. The Entrust label allows a total of 9 oz per acre per year (maximum 2.5 oz/acre/application on stone fruit), with the restriction that no more than two consecutive applications be used. PyGanic would be a logical choice for rotation with Entrust. The rate of Entrust specified by the 2(ee) label for SWD is 1.25-2.5 oz/acre (the same as the Section 3 stone fruit label); the following table summarizes the number of applications possible at various rates.

Entrust rates at various numbers of application

total oz	n applications	oz/application
9	4	2.25
9	5	1.80
9	6	1.50
9	7	1.29

A variation would be to vary the rates over the season, using higher rates closer to harvest when fruit is more susceptible, e.g., for 5 weeks of control:

Entrust rates and rotation timing

Week	oz/acre
1	1.25
2	1.25
3	2
4	2
5	2.5
total oz	9

{ PyGanic
 { PyGanic

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%).

Organic growers should consider continuing a GF-120 program even though Entrust and PyGanic are used as the primary controls for SWD. SWD adults that feed on the bait are killed; it is likely more a question of rate: the numbers of droplets/acre versus the number of flies per acre determine the likelihood of flies encountering bait. Unlike cherry fruit fly, SWD does not have a significant preoviposition period, thus damage could happen before they can find and feed on the bait. Note that the total spinosad AI is limited to 0.45 lb AI/acre/season; the usage of Entrust (spinosad) will have to be adjusted accordingly.

At this writing (March 2011), a Special Local Needs (SLN, or 24c) label application for Entrust has been made to the Washington State Department of Agriculture. This proposed label would allow for a 3-day preharvest interval for Entrust on sweet cherry (versus the current 7 day PHI), while limiting the total amount per season to 6 oz (instead of 9 oz on the main label). Conventional growers may benefit from the short PHI usage pattern, while organic growers will likely prefer the higher total seasonal use rate. If granted, this label would provide an additional option for the use of Entrust; it does not replace the primary label. Growers wishing to use up to 9 oz can still use the primary label, as long as they observe the longer PHI.

Cherry Pesticides for Spotted Wing Drosophila - 2011

Trade Name	AI	Chemical Class	REI	PHI	max per app	max/acre/yr	retreatment interval	Notes
Success 2F	spinosad	spinosyn	4 h	7 d	8 fl oz	29 fl oz	See Notes	Do not apply more than 3 consecutive sprays of group 5 (spinosad/spinetoram) insecticides. Do not apply more than 0.45 lb AI of spinosad (Success, Entrust, GF-120)
Delegate 25WG	spinetoram	spinosyn	4 h	7 d	7 oz	28 oz/4 apps	3-7 d (thrips/other)	
Malathion ULV 9.79EC	malathion	organophosphate	12 h	1 d	16 fl oz			
Diazinon 50W	diazinon	organophosphate	4 d	21 d	4 lb			Maximum of 2 applications/year, one in the dormant period, one as in-season foliar. A closed cab is required on cherries.
Dimethoate 2.67EC (postharvest)	dimethoate	organophosphate	14 d*	NA	4 pt	4 pt	NA	*14 d REI if average annual rainfall <25 inches/year, otherwise REI is 10 days. Make a single application a minimum of 7 days after final harvest (or if "no harvest" decision is made).
Provado 1.6F	imidacloprid	neonicotinoid	12 h	7 d	8 fl oz	40 fl oz	10 d	Do not apply pre-bloom to bloom, or when bees are actively foraging
Danitol 2.4EC	fenprothrin	pyrethroid	24 h	3 d	21.33 fl oz	42.66 fl oz	10 d	
Warrior II 2.08CS	lambda-cyhalothrin	pyrethroid	24 h	14 d	2.56 fl oz	See Notes	5 d	12.8 fl oz/10.24 post bloom

Organic Materials

Trade Name	AI	Chemical Class	REI	PHI	max per app	max/acre/yr	retreatment interval	Other restrictions
Entrust 80W	spinosad	spinosyn	4 h	7 d	2.5 oz	9 oz	[7 d for CFF]	see 2(ee) label for SWD. Rates are 1.25-2.5 oz/acre
Pyganic 1.4E	pyrethrins	botanical	12 h	0 days	2 qt			
GF-120	spinosad bait	spinosyn	4 h	0 days	20 fl oz		7-14 days	maximum of 0.45 lb ai/acre/season for all spinosad products

For information on MRLs, visit <http://www.nwhort.org/CherryMRLs.html>