Over the past several months we have been making efforts to alert the wine and juice grape industries regarding the recent introduction of spotted wing drosophila (SWD) into Eastern Washington. We have detailed some information on the biology of the pest and provided monitoring and management recommendations.

To determine when grapes in Eastern Washington might become susceptible to infestation by SWD, we have been conducting “no-choice” tests. Simply put, mated adult female SWD are presented with a grape in a laboratory setting. They have the choice of laying eggs in that grape or not laying eggs, thereby having no offspring.

For our no-choice tests we are working with a Concord grape cv. ‘early Campbell,’ wine grapes including Merlot and Riesling, and, as a positive “ripe” control, an organic table grape cv. ‘Flame’ purchased from a local grocery store. Our treatments are:

1. berries extant and not wounded with 5 adult female SWD added to the arena.
2. berries wounded with 5 adult female SWD added to the arena.
3. berries extant and not wounded with no adult female SWD added to the arena.
4. berries wounded with no adult female SWD added to the arena.

In our bioassays, individual grapes are placed in plastic specimen cups. Five adult female SWD are placed in each of the cups used for Treatments 1 and 2.

The wounds inflicted on the grapes in Treatments 2 and 4 are designed to mimic damage from a small bird pecking at the grapes or other minor mechanical injury that pierces the grape skin.

Treatments 3 and 4 were included as negative controls just to make sure that any infestation was not the result of oviposition in the vineyard. To date we have had no observances of SWD in these negative controls.

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We have been running our no-choice bioassays weekly since August 10, 2010. As part of our study we have been measuring Brix with a handheld refractometer (Brix Stix, Series 200, Kernco Instruments) to provide some measure of fruit maturity. Throughout the tests this month, the Brix in our positive control Flame table grapes have remained in the range of 15 to 18 and we have had SWD oviposit and develop on injured and uninjured grapes. The resulting maggots have pupated and eventually emerged as adult flies in approximately 8.5 days. In the first two no-choice bioassay studies (August 10 and August 16-17), the Brix observed in all three Washington grape varieties (wine and juice) were at a level near 6. However as the grapes are maturing through veraison the Brix have increased dramatically in the two wine grape varieties (see table at right). We began to see oviposition (egg-laying) activity among the Washington wine and juice grape treatments in the August 23 treatment, which is detailed in the table above.

On August 23, each treatment was replicated 5 times. Our organic Flame table grapes were purchased at a supermarket in Grandview, WA and the Concord, Merlot, and Riesling grapes were collected from Hogue Ranches on the Roza. As previously, SWD were able to complete their lifecycle on both the injured and uninjured Flame table grapes. They were not able to successfully oviposit into extant Washington grapes (Treatment 1), but the female SWD laid eggs at the injury sites on the injured Concord, Merlot, and Riesling grapes (Treatment 2). These eggs hatched and after 1 day the maggots died on 2 of the 3 Concord grapes containing eggs, but the eggs laid in the injury sites on the Riesling and Merlot grapes hatched and the maggots survived in 4 of the 5 SWD-exposed replicate grapes in each variety. However by 7 days after the eggs were laid, the larvae in the Merlot and Riesling were still small and had not pupated. This is in sharp contrast to the Flame grapes where the maggots successfully pupated in 4 of 5 grapes. On one Concord grape we have observed 1 pupa, which may be a biological outlier.

As previously mentioned, SWD oviposition or maggot development was not observed in Treatments 3 and 4, the negative controls, implying that all SWD infestation is the result of the exposure of the grapes to SWD in the no-choice tests in the laboratory.

We will repeat these studies through harvest and will continue keeping grape growers updated.

**Discussion/Conclusions**

These no-choice tests are obviously artificial and may not directly indicate how SWD will survive in actual vineyards. However they do give us some indication of how ripe grapes need to be before SWD adult females can lay eggs and the maggots can successfully develop in grapes. It appears that at this point grapes in vineyards in Washington are not serving as complete hosts for SWD. The bioassays we initiate and evaluate over the next several weeks will hopefully give us an indication as to when grapes become suitable hosts for SWD and whether control recommendations are necessary.

**Watch for updates as new data are processed. [http://ipm.wsu.edu](http://ipm.wsu.edu)**

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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