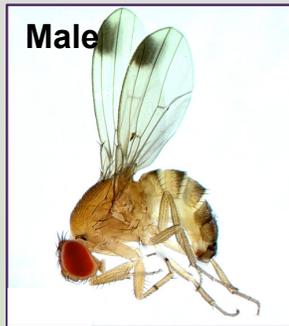


# Spotted Wing Drosophila

**Introduction:** Drosophila flies, also known as fruit or vinegar flies, are not usually serious pests of grapes. However, the invasive spotted wing drosophila (*Drosophila suzukii*) or SWD, is of concern because it attacks undamaged fruit and is known to cause damage to grapes as well as other thin-skinned fruits. Before the fruit begin to ripen, growers should monitor adult presence in vineyards using a 60:40 blend of red wine and apple cider vinegar or commercial lures (i.e. Scentry, Trécé). For more info: [pubs.cas.psu.edu/FreePubs/PDFs/ee0044.pdf](https://pubs.cas.psu.edu/FreePubs/PDFs/ee0044.pdf)

- SWD have four life stages: egg, larva, pupa, and adult
  - Depending on temperature, egg to adult development takes between 8-25 days
- **Eggs** are milky white with two filamentous breathing structures and are around 0.02" long
- **Larvae** are milky-white, cylindrical, and leg-less, ranging from 0.02 - 0.15" in length
- **Pupae** are light brown and 0.11" long.
- **Adults** are 0.07-0.13" long, have red eyes, and live about 3 to 9 weeks
  - **Males** have a characteristic black spot on the tip of each wing
  - **Females** have a saw-like, egg-laying structure (an ovipositor) that is only visible under magnification



**Management:** SWD attack and infest fruit as the berries ripen, beginning at **véraison**, and significantly increasing when fruit reach 15 degrees Brix. Applying sprays before SWD is present may needlessly decimate beneficial predatory insects and pollinators. Check traps and fruit carefully and initiate sprays only if flies are captured. Monitoring is crucial, as maintaining a clean crop is easier than trying to regain control. **Note** that It is critical to rotate among differing modes of action and early use of pyrethroids will decrease the number of applications available in late season. Additionally, practice proper sanitation, because flies will re-infest fallen fruit, and thus waste disposal is very important. *Since wine grapes have many berries per cluster and are processed, some level of damage is acceptable before control tactics are necessary, as long as there is no significant increase in rot and final fruit quality is not affected.*

Table: Current insecticides labeled for the management of SWD in grape production.

IRAC	Active Ingredient	Trade Name	Rate/acre	REI (hrs)	PHI (days)	Applications/season	Efficacy	Special Permit
1B	Malathion	Malathion 8F	1.88 pt	24	3	2	+++	
1B	Phosmet	Imidan 70WSB	1.3-2.12 lb	14 days	7-14 (see label)	6.5 lb	++++	
3A	Fenpropathrin	Danitol 2.4EC	10.6-21.3 fl oz	24	21	2	++++	
3A	Bifenthrin	Brigade WSB	8-16 oz	12	30	16 oz	++++	2(ee)
3A	Zeta-cypermethrin	Mustang Maxx 0.8E	2-4 oz	12	1	24 oz	++++	2(ee)
5	Spinetoram	Delegate 25W	2-5 oz	4	7	5	++++	2(ee)
5	Spinosad	Entrust 2SC	4-8 fl oz	4	7	5	+++	2(ee)

# Mites

**Introduction:** Mites, particularly the **European red mite (ERM)**, *Panonychus ulmi*, and the **two-spotted spider mite (TSM)**, *Tetranychus urticae*, can be a major pest within vineyards, causing extensive injury if uncontrolled. Damage results mainly from foliar feeding, which causes the leaves to look chlorotic, stippled, or mottled in appearance. Such damage can result in smaller fruit and lower yield the following season.

- **ERM:** Overwinter as eggs deposited in groups on roughened bark or around buds and hatch with bud development the following spring. ERM females are 1/64 inch long, bright red, and have four rows of white hairs on their backs. Males are smaller, yellow-green in color, and have pointed abdomens.
- **TSM** overwinters as mature yellowish-orange females under bark or ground cover around the base of the host plant. The adult female is eight-legged, 1/64 in long, and pale yellow-green. This species has two dark spots showing through the transparent body wall. The abdomen is oval and sparsely covered with spines.

**Monitoring:** During the dormant period and up to early bloom, vines can be evaluated for overwintering ERM eggs. Additionally, leaves should be monitored for adult ERM and TSM mites. Acaricides should be applied only if ERM exceed **10 ERM** or **5 TSM** per leaf and more than minor bronzing occurs.



**Management:** Scout for ERM eggs pre-bloom by examining twigs and buds with a hand lens. Oil treatments (e.g., superior oil) are typically sprayed when bud development begins to prevent the hatching of overwintering ERM eggs. High spray volume (100 gallons per acre) is needed to coat eggs hidden in rough bark. Post-bloom, apply miticides for ERM and/or TSM as needed before serious plant damage occurs. Mite populations may develop resistance to chemicals used against them, so it is necessary to rotate modes of action for miticides. Always follow label directions.

Table: Current miticides labeled for the management of mites in grape production.

IRAC	Active Ingredient	Trade Name	Rate/acre	REI (hrs)	PHI (days)	Applications/season	Efficacy
6	Abamectin	Agri-Mek 0.15EC	16 fl oz	12	28	2	+++
23	Spirodiclofen	Envidor 2SC	16-32 fl oz	12	14	1	+++
10A	Hexythiazox	Onager 11.8EC	12-24 fl oz	12	28	24 oz	++
10B	Etoxazole	Zeal WP	2-3 oz	12	14	1	+++
12B	Fenbutatin oxide	Vendex 50WP	1-2.5 lb	48	28	2	++
20D	Bifenazate	Acramite 50WS	0.75-1.0 lb	12	14	1	++++
21A	Pyridaben	Nexter 75 WP	8.8-10.67 oz	12	7	2	++
21A	Fenpyroximate	Portal 5EC	1-2 pt	12	nonbearing only	2 pt	+++
25A	Cyflumetofen	Nealta 1.67WSP	13.7 fl oz	12	14	2	+++
UN	Horticultural oil	Superior oil	2 gal	4	0	1	++
UN	Horticultural oil	TriTek	1-2% solution	4	0	n/a	++