



Spotted Wing Drosophila

Part 4: Management

Spotted wing drosophila (SWD) is a vinegar fly that lays eggs in fruit as it ripens, so its larvae may infest fruit at harvest. Growers should monitor for this pest, correctly identify it, and take steps to minimize its populations through all available means.

Cultural Management

Harvest thoroughly. Remove all ripe and cull fruit from the planting. Paying someone to remove old fruit may be worth the cost. In pick-your-own plantings, consider rewarding customers for removing unmarketable berries. In crops harvested many times, such as raspberries, harvest frequently—possibly daily.

Dispose of unwanted fruit. Keep flies from feeding on or hatching from old fruit. SWD and other fruit fly species will multiply in cull fruit, so remove and destroy it, or bury it at least 2 feet deep. Crushing the fruit does not hamper SWD emergence.

SWD can emerge from fruit in compost piles, and its development may accelerate in warm areas of the pile. Thus, composting infested fruit is not recommended. However, research in Oregon has found that bagging fruit in plastic or covering it with plastic and exposing it to full sun for a week kills all eggs and larvae.

Field management. Besides cultivated fruit, SWD multiplies on wild fruit (raspberries or blackberries in hedgerows, mulberries, wild cherries, etc.), which can be reservoirs of SWD. Even though wild hosts may provide refuge and food for pollinators, their removal may help reduce SWD pressure.

Renovate June-bearing strawberry fields promptly. Though SWD has not been problematic on June-bearing strawberries yet, it could multiply on strawberries that remain in the field after harvest. Renovate early cultivars as harvest is completed. Remove and destroy any produce from fields that may serve as food for SWD, such as split muskmelons, and do not build cull piles, especially if located near later susceptible berry crops.

Avoid placing berry crops near plants or crops that may harbor SWD. Isolate small plantings of berry crops by surrounding them with nonattractive crops such as agronomic crops.

Trapping. Traps are for detecting adult SWD and initiating control measures, not for control. Research in Japan indicated that intensive trapping (60–100 vinegar traps per acre) decreased SWD

numbers. In Pennsylvania, intensive trapping did not reduce SWD numbers to acceptable levels.

Exclusion. Screening with extremely fine mesh (less than 0.98 mm, 18 mesh or finer) may protect crops especially in tunnels. However, venting can be problematic. Increasing airflow and introducing pollinators, if the crop is blooming, will be required.

Biocontrols

Several predatory insects feed on SWD adults and pupae; at least two exist in the Mid-Atlantic. However, predatory insects do not reproduce as quickly as SWD and do not feed exclusively on SWD; thus, control with predators is unlikely to be sufficient.

Chemical Management

The cost of spraying is much less than the cost of potential crop loss to SWD. Currently, pesticide spray recommendations target adults to minimize the number of eggs laid and thus larvae in fruit. Pesticides in four activity groups—pyrethroids (IRAC activity group 3), spinosyns (group 5), organophosphates (group 1B), and carbamates (group 1A)—have shown fairly good efficacy against SWD adults. Neonicotinoids have not been very effective against adults, though they may have some effectiveness against eggs and larvae. Pesticides in different chemical classes must be used; resistance development in SWD is very likely. Resistance to natural pyrethrins has already been reported in West Coast SWD populations.

SWD prefers high humidity, so some of the adults will be in the densest foliage or near ground level. Poor spray coverage will decrease control; missing some adults will allow populations to re-escalate. Determine adequacy of spray coverage through the entire canopy by using paper spray targets. Use adequate volumes of spray solution and pressure. Use a higher volume of water than usual or include a spreader/sticker surfactant to increase coverage. If using an airblast sprayer, drive every row middle to obtain adequate coverage. Raspberry and blackberry growers relying on backpack sprayers should consider a trellising system that opens up the canopy to improve spray access. Monitor with traps and check fruit to evaluate your spray program's effectiveness.

Applying sprays before SWD is present may needlessly decimate populations of beneficial predatory insects and pollinators. Check traps daily as harvest approaches and initiate sprays if flies

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Trade name	Active ingredient	Preharvest interval (days)*					Effectiveness	Residual activity under ideal conditions
		Raspberries	Blackberries	Blueberries	Strawberries	Cherries		
Pyrethroids and pyrethrins (IRAC activity group 3A)								
Brigade	bifenthrin	3	3	1	0	X	Excellent	5–7 days
Danitol	fenpropathrin	3 ^a	3 ^a	3 ^a	2 ^a	3 ^a	Excellent	5–7 days
Baythroid	beta-cyfluthrin	X	X	X	X	7 ^a	Excellent	5–7 days
Mustang Max	zeta-cypermethrin	1 ^a	1 ^a	1 ^a	X	14 ^a	Excellent	7 days
PyGanic ^b	pyrethrins	0	0	0	0	0	Fair ^c	0–2 days
Spinosyns (IRAC activity group 5)								
Delegate	spinetoram	1 ^a	1 ^a	3 ^a	X	7 ^a	Excellent	7 days
Radiant	spinetoram	X	X	X	1 ^a	X	Excellent	7 days
SpinTor	spinosad	1	1	3	1	7	Excellent	5–7 days
Success	spinosad	1 ^a	1 ^a	3 ^a	1	7 ^a	Excellent	5–7 days
Entrust ^b	spinosad	1 ^a	1 ^a	3 ^a	1	7 ^a	Good	1–3 days
Organophosphates (IRAC activity group 1B)								
Malathion	malathion	1 ^d	1 ^d	2 ^d	3	3	Excellent	>7 days ^e
Diazinon	diazinon	X	X	7	5	21	Excellent	>7 days
Carbamates (IRAC activity group 1A)								
Imidan	phosmet	X	X	3	X	X ^f	Excellent	>7 days
Lannate	methomyl	X	X	3	X	X	Excellent	>7 days

*X = the material is not labeled for use on the crop.

a. 2(ee) labels have been issued for use against SWD on this crop.

b. May be used in organic production. The REI is 12 hours even though the PHI is 0 days.

c. Provides knockdown of nonresistant populations, but has little residual activity.

d. In Pennsylvania, 24(c) labels for Malathion 8F have been approved that allow more applications per year (brambles) or a higher rate with a longer PHI to increase residual control (blueberries).

e. Length of residual activity varies with rate.

f. Labeled for tart cherries only with a 7-day PHI.

are captured. Once sprays are needed, choose spray materials and time applications to protect pollinators. Check the first ripe fruit very closely—maintaining a clean planting is easier than trying to regain control. When possible, use materials with a FIFRA 2(ee), 24(c), or full label that specifies rates for SWD management since the product's effectiveness has been established at these rates.

The table above lists insecticides that have been effective against SWD for especially vulnerable crops. Materials with a long preharvest interval may be used right after harvest to decrease populations if later susceptible crops are nearby.

Occasionally, residual activity is reported to be shorter than what is listed above, so monitor traps for return of adults closely. All materials listed work on SWD primarily by contact, so spray coverage must be thorough.

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