

Prepare your pest management schedules now for 2018 berry season

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We have learned a lot about spotted wing drosophila (SWD) over the past few years, ever since this invasive pest came to Ontario. There is still more to learn, and one thing we don't know is when this pest will arrive in 2018. In 2017 SWD arrived in Ontario 2-3 weeks earlier than previous years. It is hard to predict what will happen this season, but it is important that growers monitor for SWD early this year, beginning in early June, and are prepared to manage SWD, including management for early-fruiting berry crops. If SWD is identified on your farm or in your area, and there is ripe fruit present, it is time to start control.

There are many parts of the SWD management puzzle. Chemical options are not the only solution. Incorporate the following practices to help manage SWD before harvest begins and reduce pressure during harvest:

Harvest early, clean and often. Harvesting every day or two will make a big difference in controlling SWD. Remove unmarketable fruit as pickers move through the field. If there is ripe fruit in your field this is host for SWD.

Ground cover management. Black weed mats or fabric in between raspberry rows will radiate heat and reduce the humidity, reducing the ideal conditions for SWD. The weed mats will also limit the ability of the pupae to burrow into the soil and leave them vulnerable to natural predators.

Ensure thorough spray coverage. Most registered insecticides are targeting the adult life stage, so it is important that the insecticides reach the adults in the canopy. Spray when adults are most active in the crop, from 6:00-10:00 am and 6-10:00 pm. Prune the canopy to achieve better coverage as well as reducing the favourable environment for SWD inside the canopy, who prefer humid, shaded and cool areas. Slow down and spray every row to ensure thorough coverage.

Maintain spray coverage. Begin to use insecticides once SWD is identified in your area and there is ripe fruit on your farm. Reapply insecticides every 5-7 days, and re-apply after a rain. It is important to use products from different groups rather than use on product or group of products repeatedly. There are five registered insecticides for SWD. Two emergency use registrations have been submitted and will hopefully be available to growers this season. Stay tuned for more information.

Registered Products	Crops
Imidan	Blueberries
Exirel	Blueberries, raspberries

Success	Blueberries, raspberries, strawberries
Delegate	Blueberries, raspberries, strawberries
Entrust	Blueberries, raspberries, strawberries

Cold storage after harvest. Cool fruit as quickly as possible postharvest and maintain cold storage through all stages of marketing. Temperatures below 2°C will slow development of SWD and a high percentage of eggs and larvae will be killed in cold storage.

After harvest reduce overwintering sites for SWD. A recently published study by Bal et al. (2017, *Journal of Economic Entomology*) looked at dropped or unharvested fruit and fruit waste to see if they provide a late-season reproductive resource for SWD when fresh fruit is unavailable. Dropped and unharvested apples and pears showed to be good hosts for SWD, likely because they do not often decompose over winter. Also, apple pomace from cideries and other fruit waste piles near wineries and cideries were good hosts. The risk to apples and pears in season is very minimal however this is important for mixed-crop berry and apple growers to keep in mind, and provides further evidence of the benefits of good post-harvest sanitation in orchards.

Start monitoring for spotted wing drosophila (SWD) on your farm before berry harvest begins. Put traps up in wild hosts such as wild brambles or honeysuckle and in the crop. It isn't enough to put up one or two traps on your farm (although this is probably better than not putting up traps). Michigan State University recommends at least one trap every 2-4 hectares (5 to 10 acres) plus an additional trap in wild hosts. Recent work by Rice et al (2017, *Journal of Insect Behavior*) indicates that SWD tend to prefer low hanging fruit in the interior of the canopy, and that they are an edge species. For this reason, monitoring traps should be biased to the crop borders, and placed within the crop canopy.

There are many different homemade and commercial traps and baits / lures available, and trapping systems are still being optimized. OMAFRA has typically used homemade traps baited with apple cider vinegar (ACV) for provincial monitoring programs. While these are cheap to use, they are neither species specific or able to detect SWD at low population densities. Other baits, such as yeast-sugar mixtures and commercial products (Scentry, Alpha Scents, and Trécé lures; Suzukii bait, etc.) are more effective than ACV (although still not very selective). Research conducted by Kirkpatrick et al. (2017, *Entomologia Experimentalis et Applicata*) and others suggests dry trap designs using sticky cards of spheres are more attractive and user-friendly than liquid trap systems. Regardless of what system you decide on for 2018, pick something.



Figure 1. Apple cider vinegar trap.



Figure 2. Yellow Sticky Card for SWD monitoring. Photo courtesy of Michigan State University.

At what point should you be worried about SWD, if you are finding it in traps? Work conducted by Kirkpatrick et al. (2018, Journal of Economic Entomology) in cherry indicates that by the time SWD is detectable (single fly in a trap), the population is probably already above the tolerable damage threshold, and control measures should immediately be taken if the fruit is in a vulnerable stage. The same may be true for berry crops. Use salt water tests or plastic baggie tests once harvest begins to evaluate your management program and monitor SWD on your farm. If SWD is in your area and you have ripe fruit, it is time to start chemical control. Be prepared to manage SWD in your early-season berries if necessary.

Follow the OnFruit blog for information through the season on SWD, information on on-farm trapping and monitoring including salt-water tests, and an updated list of available products.