
Monitoring Spotted Wing Drosophila with Traps - 2014



Spotted wing drosophila (SWD) attacks ripe and ripening raspberries, blackberries, blueberries, grapes, cranberries, late cherries, fall strawberries, plums and peaches, plus fruit of poke-weed, glossy buckthorn, kou-sa dogwood and other wild hosts. If you wish to protect your fruit from becoming infested, it is critical to set up traps for the insects, and to monitor those traps weekly **when you have a ripe or almost-ripe crop present.** They will not attack green fruit. When the flies appear

and your crop is ripe or ripening, an insecticide spray can prevent it from being infested. The vulnerable period lasts as long as you have ripe fruit. Most of the good insecticides should give about seven days of protection, but can be washed off by rain. The first flies will probably be trapped between July 2 and 12, and numbers will peak in September or October.

These traps **ARE NOT TO CONTROL** the flies!



In 2012 & 13 we set out hundreds of traps, and learned what combinations worked well enough to make trapping a useful tool. Poorly set or designed traps do not work well enough to predict when you need to protect crops. The combination below works well, and is the result of our work, plus recent research at the Connecticut Agriculture Research Station in Windsor. We use red plastic 18 oz [4.5 inches high] Solo cups, with transparent lids. We placed a black band of electrician's tape a bit below the rim. We used a heated nail to melt 1/8 inch holes in the cup, to allow the insects to get in, and the odor to escape. We don't make those holes too large, or wasps will get in. We placed the entrance holes in and around that band. We made a lot of them... about 30 to 35 holes per trap. Following Heather Faubert's (Univ RI) pattern, we left one sector of the cup without holes, to make it easy to pour out and examine the liquid bait, without spilling any.

Next, we got some 4 oz plastic cups with lids (urine sample cups, actually...don't ask) and cut a large [1 inch or more] hole in the lid. Over the hole we placed fine insect netting, and fastened it with a hot glue gun. The netting is to allow the yeast odor out, but not let flies in. So the assembled trap is a large red cup. Inside that you will place 2 oz of liquid bait (formula below). Floating upright in that bait will be the smaller cup with the insect netting in the lid. Inside the smaller cup will be the flour and yeast bait (formula below).



Research proves that this bait combination is very effective. Research also shows that if you mix the liquid bait with the yeast/dough bait, you quickly get a slimy mass that is impossible to examine for SWD. That's why we keep the two baits separate. We mix up a fresh batch of bait every week. The liquid can be stored for a few days in a refrigerator, but the yeast/flour bait must be fresh.

Checking the traps

To check the trap, remove the lid, remove the insert cup and set aside. Pour the liquid bait into a shallow white pan or saucer. In bright light, examine for the male flies (they have a dot near the tip of each wing) with a 2X magnifying glass. We no longer put yellow sticky cards in the traps... too much work. We don't bother to examine the yeast bait. When done counting the male SWD's, write the number down. Then discard the old liquid bait in a container, and pour in add new bait. We found it easier to have a spare



insert cup ready with fresh yeast/flour bait, and switch it with the old one. Then we disposed of both the old liquid and solid baits at the farm dump. Don't pour it on the ground in your fruit planting, or it will compete with your traps for the flies' attention.

When to set up the traps - Do this as soon as fruit starts to ripen. You can stop monitoring when harvest of susceptible crops is over for you. Don't bother to set them up before June 28th. I don't expect the flies that early.

Where to set the traps - Set the traps IN the crop, in the shade, AMONG THE FOLIAGE in the zone near fruit. I recommend checking traps every 5-6 days at first, moving to every 3-5 days in August (hot weather). As the weather cools, you can lengthen the check interval. Keep checking as long as you have ripe fruit to protect.

Highest risk crops seem to be: August & September-ripening raspberries and blueberries; August & September ripening strawberries; thin-skinned, colored grapes; some peaches and plums (especially white-fleshed peaches). We don't know how heavily currants and cranberries are attacked.

How many to use? For a small planting, two well-placed traps should be enough. For a large, uniform planting, three may be better. If you have different crops, you'll want traps in each crop, because the pattern of attack varies crop-to-crop. If you have different varieties of the same crop, begin monitoring in the first variety to ripen, and move the traps to others with ripe fruit when harvest wanes on that first variety. If your crop is in several blocks that are separated, you'll need traps in each block.



How long do I monitor? Keep checking until harvest of susceptible fruits ends for you.

Identifying the catch - search for male SWD's. They will be 2mm long, with a light tan body, red/orange eyes, and a dark spot near the tip of the wing. I use a large 2x magnifying glass to make identification easier. Don't bother to try to identify females. That requires a microscope.

Once you know the general size to look for, just look for something that size & color, with the spot near the tip of each wing.

Cultural methods of control - Eliminate nearby unmanaged hosts **that fruit before your crop ripens**. In particular, look for pokeweed, blueberry, brambles, and glossy buckthorn. We are uncertain how important honeysuckle fruit are to SWD. Kousa dogwood fruit are important hosts, but appear quite late in the year. I think it is important to destroy dropped peaches, especially those in the shade. If you hire your own pickers, have them remove all spoiled fruit, and destroy them, as they pick good fruit. Dumping the fruit in a pile does not destroy it!

Prune your plants so as to allow good penetration of spray materials. The flies spend a lot of time in interior of the bushes, and if your spray doesn't penetrate there, it won't work very well. Also, the flies prefer dense vegetation, so pruning to open things up makes it less attractive to the flies.

Bait Mixtures for Spotted Wing Drosophila Traps

The bottom line is that **apple cider vinegar works very well as a bait**. It is inexpensive and simple to use. The odor strongly attracts all drosophilid flies, including SWD. Adding other components can improve the effectiveness of the trap, but is more time consuming and more costly.

1. Add just a drop or two of liquid soap to the bait. Flowery-scented soaps might decrease bait effectiveness. For this reason, last year I used lemon-scented soap. I couldn't find unscented liquid soap. The soap decreases the surface tension of the bait, making it easier for the small flies to fall in and drown.
2. Adding a bit of yeast, apple cider, or cheap red wine has been shown to improve attractiveness.
3. You may prefer to make up liquid bait in batches large enough to last a week or so, and store it (carefully marked!) tightly sealed in a refrigerator. For yeast/flour bait, make up a fresh batch every time, rather than store it.

- **“Superbait”** - 88 fl oz water, 32 fl oz cheap red wine, 6 fl oz molasses, 3 fl oz apple cider vinegar, 1 teaspoon unscented dish soap.
- **Yeast bait** - 2 teaspoons active dried yeast, 1 teaspoon sugar, 2 cups water. Mix and let stand overnight.
- **Landolt Bait** - 51 fl oz apple cider vinegar, 77 fl oz red wine.
- **Baker's blended bait** - 90 fl oz white vinegar, 2 lbs sugar, 1 fl oz phenyl ethanol, 2 teaspoons lab ethanol, 1 small drop Fly nap (triethylamine).
- **Whole wheat bread dough** - 12 fl oz water, 2 tablespoons vegetable oil, 1 ½ teaspoons salt, 2 tablespoons sugar, 4 cups whole wheat flour, 2 teaspoons active dry yeast. This was the yeast & flour bait we used. It works well, but is very messy.

Note: adding yeast and/or bread dough makes the bait a slimy mess, hard to search for flies.

Spraying - Coordinate your spraying with trap checking. It is much more important to get spray materials on the undersides of the foliage, and the interior part of the canopy, than the upper surfaces of exposed leaves. The flies spend little time on upper surfaces of exposed leaves.

Trap and/or Supplies Sources

Great Lakes IPM -
(3 x 5 yellow sticky cards)
1022 East Church Rd
Vestaburg, MI 48891
800-235-0285
www.greatlakesipm.com

Gemplers, Inc. -
(3 X 5 yellow sticky cards, magnifiers),
PO Box 44993
Madison WI 53744-4993
800-382-8473
www.gemplers.com



Fact sheet by Alan Eaton, UNH Cooperative Extension Specialist, Entomology

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