THE OHIO STATE UNIVERSITY

Spotted Wing Drosophila Monitoring and Management Program Report – 2016

Jim Jasinski, IPM Program Coordinator, Dept. of Extension
Celeste Welty, Extension Vegetable Entomologist, Dept. of Entomology

Overview

Since the first detection of Spotted Wing Drosophila (SWD) in September, 2011, the OSU Extension IPM program and the Dept. of Entomology have joined forces to create a statewide monitoring network for this invasive pest. This network has mostly been run by Extension educators who monitor for this pest on a weekly basis at grower farms in their county on crops such as raspberry, strawberry, blueberry, grapes, blackberry, and peaches, and then report that information at http://u.osu.edu/pestmanagement/ for others to view. The key to this network being successful is the short time between trap check and identification of any SWD flies in the sample, so that growers can swiftly begin their management plan upon the first detection of this pest.

The network in 2016 was about the same size as 2015, with 13 Extension educators covering 19 counties (Figure 1). There were a total of 44 sites (fruit plantings on a farm), with 1-4 traps per site. This year we changed the type of trap used to the commercially available Scentry trap, which is similar to a standard 24 oz. peanut butter jar with a screw top lid (Figure 2). We also changed to the Scentry lure as the main bait, which lasts for about 30 days and hangs from an "S" shaped metal hook that passes through the lid, and then the whole trap hangs from plant vegetation. Most of the traps in the network only used the new Scentry lure as the bait, but a few sites compared the Scentry lure with only 100% apple cider vinegar (ACV) as both the bait and drowning solution. In the traps using the Scentry lure, the drowning solution was typically 25% ACV to prevent deterioration of specimens between weekly collections. In comparing the Scentry lure and 100% ACV traps, the 25% ACV used as the drowning solution did not seem to affect bait performance, measured by SWD captures, but did reduce the amount of specimen deterioration.

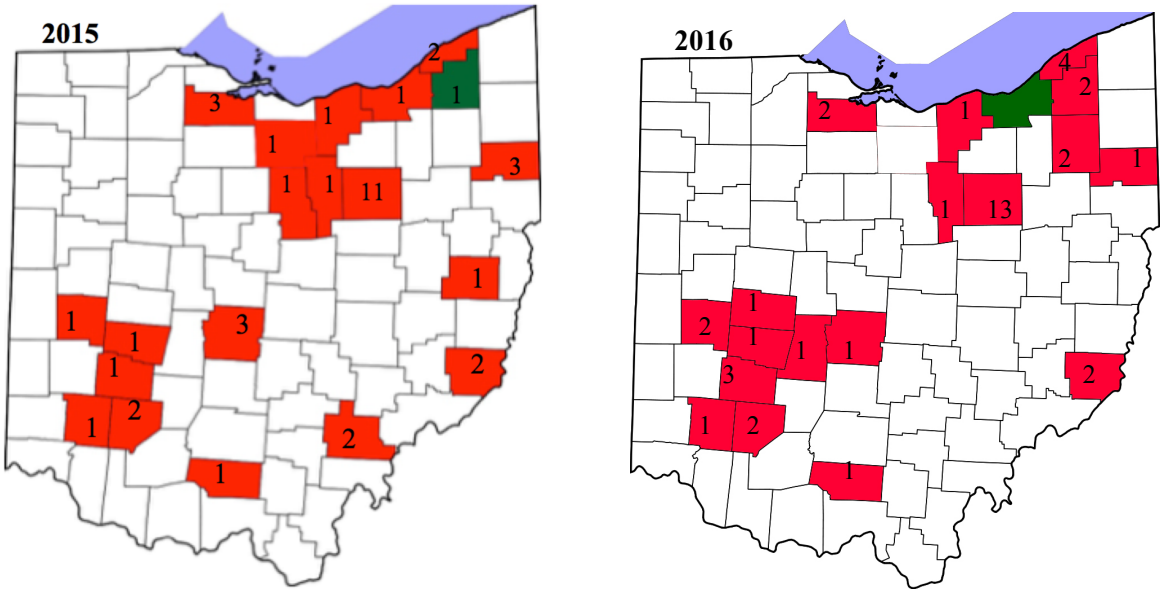

Figure 1. 2015 and 2016 SWD distribution maps using cooperator data. Green counties indicate no SWD detected, red counties are positive for SWD. Numbers inside counties indicate the number of trapping sites.

The first SWD traps were put in the field during the week of May 15 in Franklin county, but most of the traps in the network were put out during the first week in June. Traps remained in the field at their original site for anywhere between several weeks and the entire season, and some traps were moved around on different crops at the same farm during the season depending on the presence or absence of ripening fruit. Traps were removed from the field the last week of September.

The first SWD adult captures occurred during the week of June 12 at four county locations; Clark county on raspberries, Clinton county on raspberries, Wayne county on berries, and Miami county on grapes. These early season detections are in line with what we saw in 2015 except the locations were different. Full details of counties, cooperators, crops, bait types and first detection of SWD can be found in table 1.

Figure 2. SWD Scentry trap used in 2016.

There were 59 individual traps placed in the network, and 50 of those traps captured adult SWD. Six traps that didn't catch any flies were set up for a period of only 3-4 weeks in early June, the other three traps were set out for a period of 9 weeks. Looking at the number of weeks where trap catches peaked revealed the first major SWD populations blooming during the weeks of July 17 and 24 for the Scentry lure baited traps, and more peak catches occurring later in the season with 100% ACV baited traps around the weeks of September 18 and 25 (figure 3). These peak catches are likely a reflection of the geographic range of traps across the state on various crops that ripen at different times, causing spikes in trapping numbers throughout the season.

At seven sites, both Scentry lures and 100% ACV baited traps were placed approximately 50 feet from each other. In all seven of those comparisons, the Scentry lure baited trap captured SWD adults 1-5 weeks before the 100% ACV baited trap, giving up two weeks advanced notice on average (table 2). This would suggest that for early detection, which is the basis for management, the Scentry baited lure should be used until first detection, and then the bait can be switched to 100% ACV, which is considerably less expensive. Although the Scentry baited traps detected SWD earlier and in greater numbers, there was a tradeoff. The weekly Scentry lure samples had tremendous amounts of non-target fly by catch which made it very difficult to sort through the sample and find SWD positive flies. Estimates of the ratio of SWD to non-target flies would range between 1:100 and 1:500.

Intensive trapping was done on farms in Clark, Greene, Clinton, and Warren counties. The SWD captures were mapped for both bait types with the insecticide sprays applied to these crops to see the effects on the fly populations in response to the treatments (figs 4-9). In general at the Greene county site there is a pattern of population growth during the week of July 10 but the population is suppressed by insecticide applications made every 3-4 days using three active ingredients (malathion, spinosad, pyrethrin + PBO). Sprays were halted at the end of August and fly populations exploded until the end of the trapping season. To manage this site from first detection during the week of June 19 through the end of August required 14-15 insecticide sprays.

Conclusions

The 2016 season continued to show SWD as a significant pest to all untreated cane berries, grapes, peaches, and blueberries, grown by backyard hobbyists or commercial farms. Although our trapping network is vast, it is not in every county, but we have no reason to believe that it could not be found in every county if we had the resources to monitor for it. We were able to demonstrate this year that the type of bait used matters, in some cases giving up to five weeks advance notice of presence over a standard 100% ACV lure. Although this bait is more expensive, given its sensitivity to attract SWD, it should be considered a worthwhile investment for anyone monitoring for this pest.

NOTE: As a side note, while sorting through weekly samples of SWD, another invasive pest called the African Fig Fly (AFF) was confirmed in samples from several counties in 2016, but was first collected and noted in at least one site in 2015. Unlike SWD, this pest cannot damage ripening or ripe berries, it must first wait for some type of injury or senescence of the fruit to attack. This pest is not thought to present challenges unique from those faced with managing SWD or other Drosophilids, and we expect that any measures to protect fruit from our current pest complex will result in control of AFF.

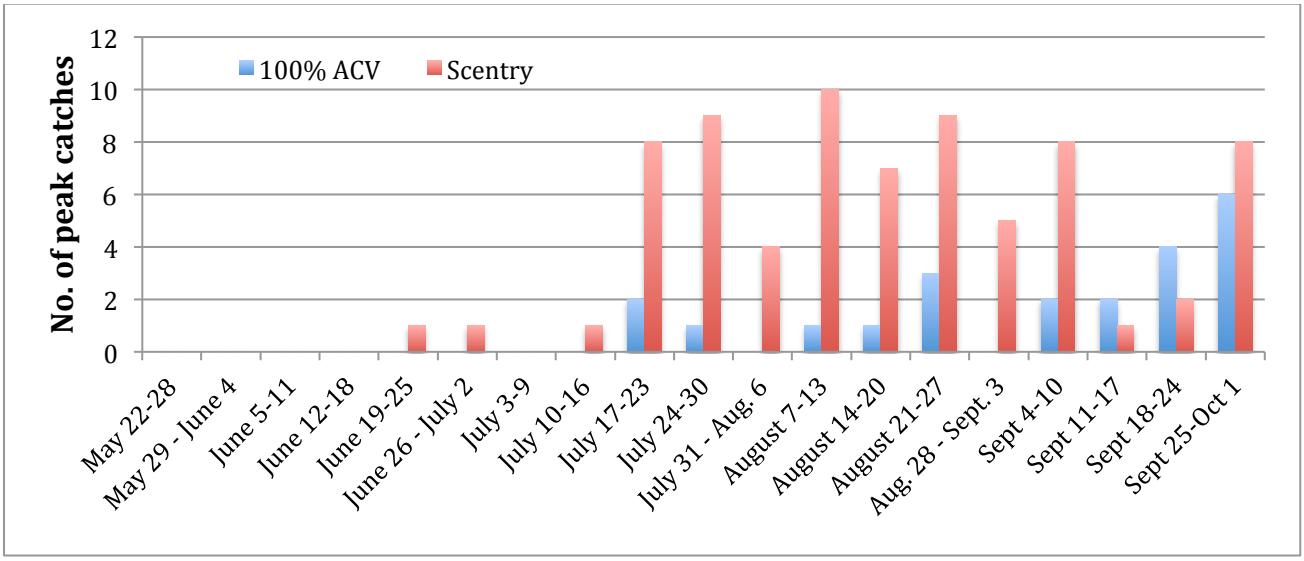

Figure 3. Peak trap catches of SWD adults at sites in the trapping network by lure type and date.

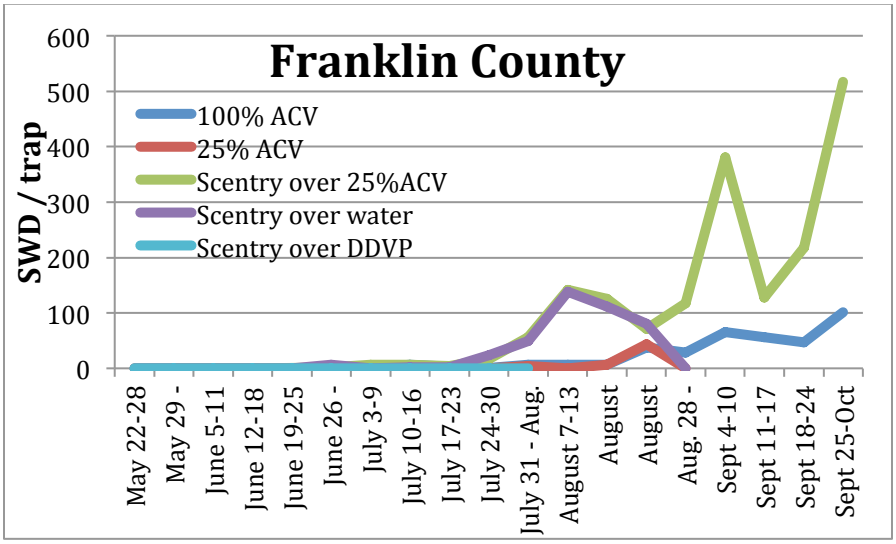

Figure 4. Seasonal trap catch of SWD adults at a raspberry site using Scentry traps in combination with various baits and drowning solutions.

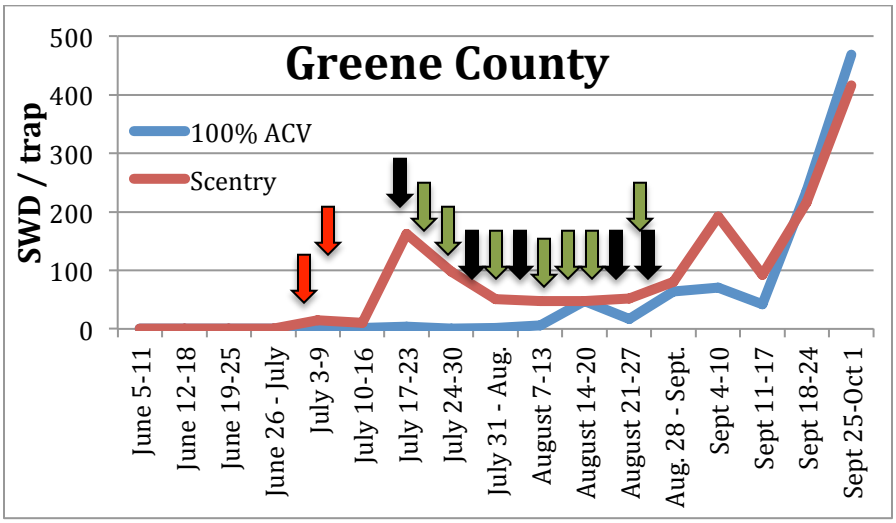

Figure 5. Seasonal trap catch of SWD adults at a blackberry site using Scentry traps in combination with various baits. Red arrows indicate Malathion sprays, black arrows indicate Entrust sprays, and green arrows indicate Evergreen sprays.

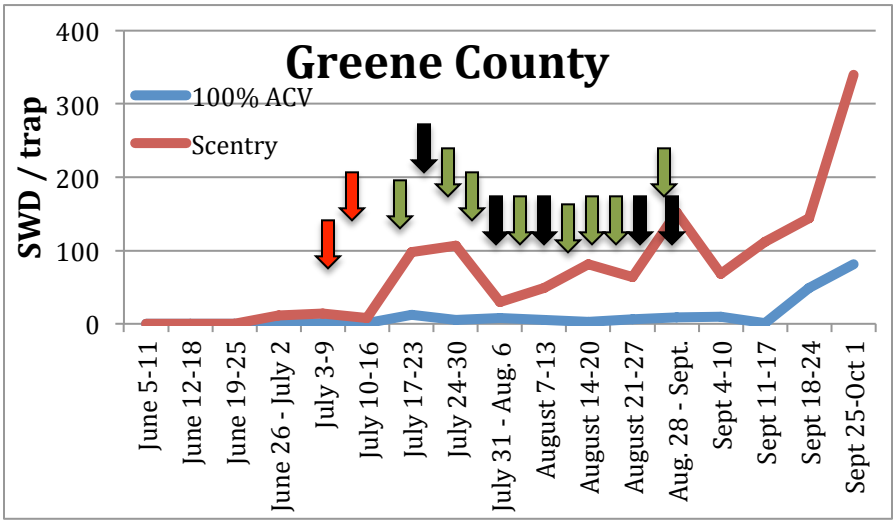

Figure 6. Seasonal trap catch of SWD adults at a raspberry site using Scentry traps in combination with various baits. Red arrows indicate Malathion sprays, black arrows indicate Entrust sprays, and green arrows indicate Evergreen sprays.

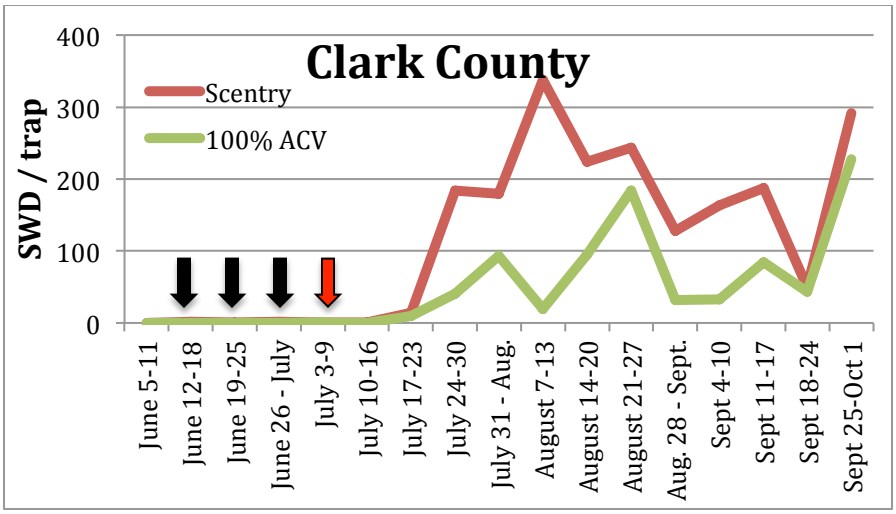

Figure 7. Seasonal trap catch of SWD adults at a raspberry site using Scentry traps in combination with various baits. Black arrows indicate Mustang Maxx sprays, red arrows indicate Brigade sprays.

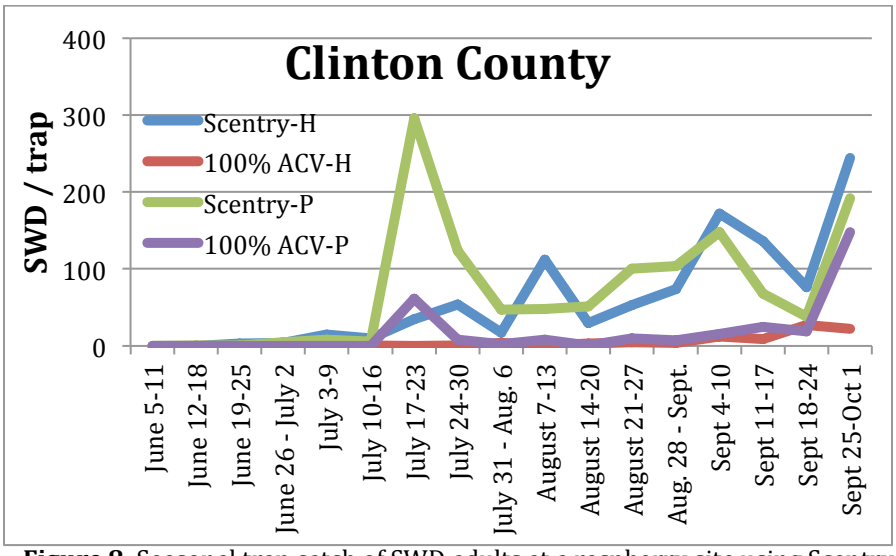

Figure 8. Seasonal trap catch of SWD adults at a raspberry site using Scentry traps in combination with various baits. Traps by the home are labeled "H", traps by the pond are labeled "P".

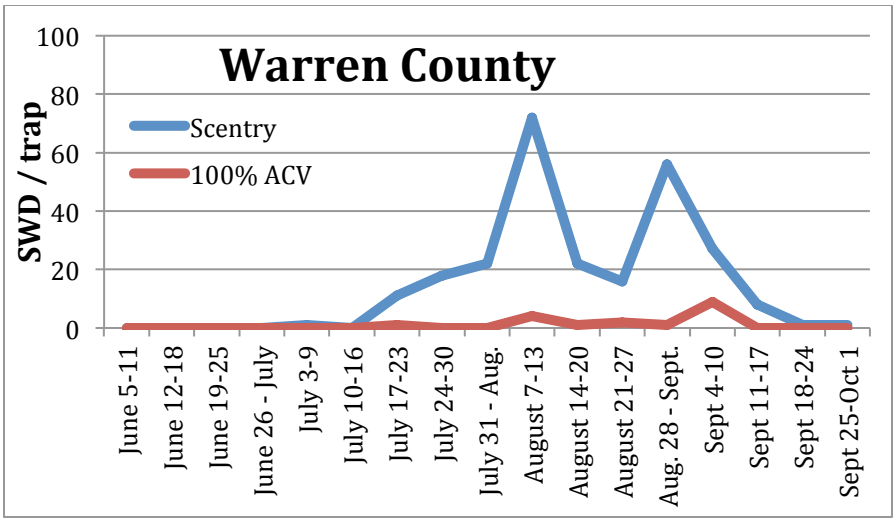

Figure 9. Seasonal trap catch of SWD adults at a grape site using Scentry traps in combination with various baits.

Table 1. List of counties involved in the SWD trapping network, the crops trapped, bait type, and total trap catch.

County	Cooperator	Crop(s):	Week of 1st detection	Bait Used	Total trap catch
Ashland	Malinich	Elderberries	24-Jul	Scentry	244
Champaign	Douridas	Red Raspberries	26-Jun	Scentry	1683
Clark	Jasinski	Raspberry	12-Jun	Scentry, 100% ACV	4008
Clinton	Jasinski	Raspberry	12-Jun	Scentry, 100% ACV	2668
Cuyahoga	Roche	Raspberry	-	Scentry	0
Franklin	Welty	Raspberry	19-Jun	Scentry, 100% ACV	2627
Geaugua	Draper	unknown	10-Jul	Scentry	174
Greene	Jasinski	Blueberry, Blackberry, Raspberry	19-Jun	Scentry, 100% ACV	5031
Lake	Kocichik	Grapes	7-Aug	Scentry	7085
Lorain	Malinich	Brambles	17-Jul	Scentry	101
Madison	Griffith	Grape	26-Jun	Scentry	628
Mahoning	Barrett	Blueberries, Raspberries, Strawberries, Peach	26-Jun	Scentry	2
Miami	Bennett	Raspberries, Grapes	12-Jun	Scentry	283
Monroe	Landefeld	Blueberries, Grapes	10-Jul	Scentry	93
PIke	Slaughter	Blueberry	17-Jul	Scentry	157
Portage	Kowalski	Raspberry, Blueberry	31-Jul	Scentry	74
Sandusky	Gahler	Grapes, Peaches	31-Jul	Scentry	230
Warren	Jasinski	Grapes	3-Jul	Scentry, 100% ACV	273
Wayne	Lewandowski	Grapes, Blueberry, Raspberry	12-Jun	Scentry, 100% ACV	7796

Table 2. First SWD detection by bait at paired sites; Scentry lure vs. 100% ACV.

County	Crop	Bait	Weeks prior to 100% ACV bait detection
Franklin	Raspberry	Scentry lure	2
Greene	Raspberry	Scentry lure	1
Greene	Blackberry	Scentry lure	2
Clark	Raspberry	Scentry lure	3
Clinton	Raspberry	Scentry lure	2
Clinton	Raspberry	Scentry lure	5
Warren	Grapes	Scentry lure	2