

Monitoring spotted wing Drosophila through a statewide network in Ohio

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ABSTRACT

Since the first detection of Spotted Wing Drosophila (SWD) in September, 2011, the OSU Extension IPM program and the Department of Entomology have joined forces to create a statewide monitoring network to understand the distribution of this invasive pest. This network has mostly been run by trained Extension educators who monitor for this pest on a weekly basis at grower farms in their county from June through September, on crops such as raspberry, strawberry, blueberry, blackberry, grapes, and peaches. The key use of traps is to determine the date of first positive capture on each farm each year so that a control program is initiated at the appropriate time. The date of first catch varied considerably from location to location. Lure and trap combinations also varied over the six years as improvements were made to either the formulation or trap design in an effort to detect adults even earlier in cultivated crops. Results were reported on an OSU vegetable and fruit pest management website (<http://u.osu.edu/pestmanagement/>) for other growers to view. One key to the network's success is the short time between trap check, identification of any SWD flies in the sample, and then posting those results to the website, so that nearby growers can use this information to swiftly initiate their management plan upon the first detection of this pest. In 2017, the network consisted of 19 counties representing 40 sites.

OVERVIEW

We have monitored for SWD the past six years through formal training of growers and Extension educators. As more was learned about the biology, behavior and management of this pest from national research programs, we provided those updates through articles in the VegNet newsletter or blog, pesticide

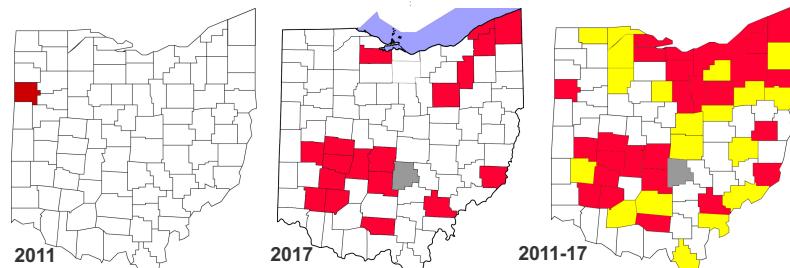


Figure 1. Initial detection of SWD (larvae) in 2011 (Left), extent of official SWD monitoring network in 2017 (Middle), and status of SWD in Ohio from 2011-2017 (Right) based on monitoring and anecdotal reports. Red counties are positive for SWD, yellow counties are suspected SWD positive, white counties have not been surveyed for SWD, and the gray county was monitored for SWD but not found.

OVERVIEW (continued)

applicator training sessions, or grower focused workshops across the state. Currently SWD has been positively identified in 28 counties and suspected in 19 additional counties (Figure 1). If a county contains susceptible cultivated host crops or has known wild hosts, we suspect that county likely has SWD.

NETWORK TRAPS & LURES

Based on research conducted in national programs focused on SWD biology, there has been a constant churn of trap designs and attractant baits over the past six years. For at least one or two seasons we have used all of the trap designs shown below (Figure 2) with various combinations of baits, such as apple cider vinegar (ACV), fermented baits, and commercial lures by Trece and Scentry. The primary goal of our monitoring network is a balance between ease of use to service and maintain the trap, component costs and durability, earliness of detection, and specificity of the bait to attract SWD adults while limiting non-target organisms. To that end, in 2016 and 2017 (and in the upcoming 2018 season) we have chosen the Scentry lure over a 25% ACV drowning solution (for specimen preservation) as our trap standard to be used in the network.



Figure 2. Different types of SWD traps used in the monitoring network from 2012-2018.

WORKSHOPS & WEBINARS

Training growers and Extension educators at workshops around the state has helped spread awareness about this pest, and give participants the tools and skills in identification, monitoring, biology, and management that are needed to keep this pest from causing serious economic damage to their crop (Figure 3). One of the most instructive parts of the workshops was the use of stereoscopes to identify both male and female SWD adults, which is key if adult monitoring is conducted. In the five workshops held across the state, we have trained 84 growers and educators. We also held a webinar in the spring of 2015 which attracted 35 viewers to review pest biology, improved monitoring techniques, and management.



Figure 3. Locations and years of SWD workshops conducted for growers and educators across the state.

INTENSIVE ON-FARM MONITORING

Most network cooperators monitor 1-2 sites with 1-2 traps each. Some cooperators monitor 6-10 sites in several counties, and also conduct salt water tests on the fruit to evaluate the grower's individual spray program. After the season is over, the grower submits their spray records which are graphed against the adult and larval counts to see if any patterns of efficacy can be determined. Depending upon the crop and insecticide program chosen, very dramatic differences in control can be seen. A red raspberry grower who prefers to use a more "organic" insecticide program initially struggled to keep adult populations low, resulting in high and then low larval populations in the fruit (Figure 4). A black raspberry grower in a neighboring county uses a more conventional insecticide program resulting in a substantially lower adult population with no larvae detected in the fruit during the shorter 2-3 week harvest period (Figure 5).

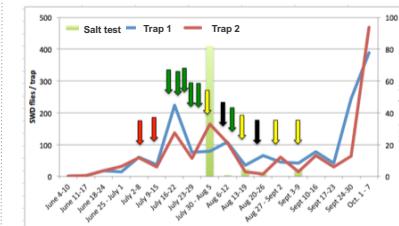


Figure 4. Adult and larval SWD population trends in red raspberry. Larval populations in fruit were monitored through salt water tests. Colored arrows indicate distinct active ingredient insecticide applications. Some mid-season applications had sucrose sugar added to the spray solution.

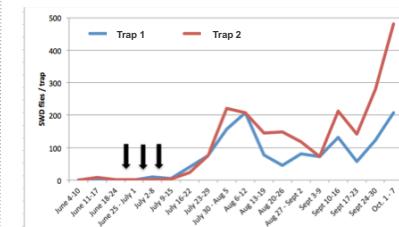


Figure 5. Adult and larval SWD population trends in black raspberry. Black arrows indicate application of a pyrethroid. Salt water tests were conducted on the fruit 21 Jun and 5 Jul but revealed no larvae.

CONCLUSIONS

- SWD adults have been positively identified in 28 counties as of 2017.
- Average 12-20 monitoring cooperators per year covering up to 20 counties across the state
- Currently recommend Scentry traps and Scentry lures with 25% ACV drowning solution; traps serviced weekly.
- Monitoring begins first week in June and ends in early October; some sites start and finish earlier and later.
- Early SWD detections in crops typically occur between mid and late June.
- SWD adults can be detected in wooded areas adjacent to host crops before they are detected in the crop.
- From 2015-17, SWD adults have been trapped in every month except March.

ACKNOWLEDGEMENTS

Special thanks to all of the Extension educators, summer interns, and station managers who helped monitor for this pest from 2012-17. This work was partially supported by the Ohio Vegetable Small Fruit Research and Development Program and USDA NIFA 20147000622507.