

Maintaining a Rapid Reaction Monitoring Team for Invasive Species

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Other Key Personnel: County based Extension Educators, key growers

Objectives(s) of research proposal:

1. Maintain monitoring network for Brown Marmorated Stink Bug and Spotted Wing Drosophila.

We have maintained trapping networks for both of these fruit and vegetable pests in 2014. Eighteen counties actively monitored for SWD at 52 sites using either apple cider vinegar or fermented yeast baited traps; 12 of those counties reported trapping SWD adults (Figure 1). There was an average of 1-2 traps per site. Crops monitored included red & black raspberries, blueberries, blackberries, strawberries, pokeberries, mulberries, elderberries, and grapes.

The first detection of SWD adults occurred in Wayne county on June 25th in brambles, with a majority of sites picking up adults by mid to late July. The total number of SWD flies captured per county is affected by the number of sites, traps, and length of trapping season in each county (Figure 2). Although this pest continued to cause economic losses to some growers in 2014, the overall level of SWD populations may have been lower than in 2013 based on the volume of grower inquiries.

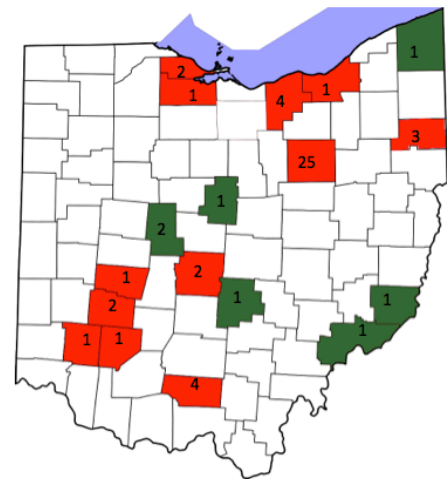


Figure 1. Counties in the 2014 spotted wing drosophila network. Numbers indicate number of sites within county. Red counties are positive for SWD adults, green counties reported no detections.

Apple Cider Vinegar vs. Fermented Yeast Baited Traps

There have been several trap styles and baits developed to trap SWD. In general, fermented yeast baited traps have been shown to be more attractive to SWD adults compared to apple cider vinegar (ACV) traps resulting in earlier captures and detection in research trials around the country. In Ohio, there were six sites with both ACV and fermented yeast baited traps set out in a crop to compare the earliness of first capture. Contrary to other research findings, ACV traps in Ohio captured SWD adults earlier at 3 sites by one week, tied with fermented yeast bait at 1 site, and had no adult captures for either bait at the other two locations.

One indirect measure of population density and effective management is to measure SWD larval infestation of small fruit brought to wholesale produce auction sites. At the Wayne County produce auction site in Northeast OH, random lots of small fruit were subjected to salt water tests to float out any larvae hidden inside fruit. Detections of larvae were first discovered August 5 and were last found September 17. Fruit was being brought to the auction as late as October 9 (Table 1). Toward the end of the season fewer lots of SWD infested fruit were found, most likely due

to increased insecticide treatment, as SWD populations tend to remain high through October. Blackberries, red raspberries and grapes were the only fruit found infested at the auctions.

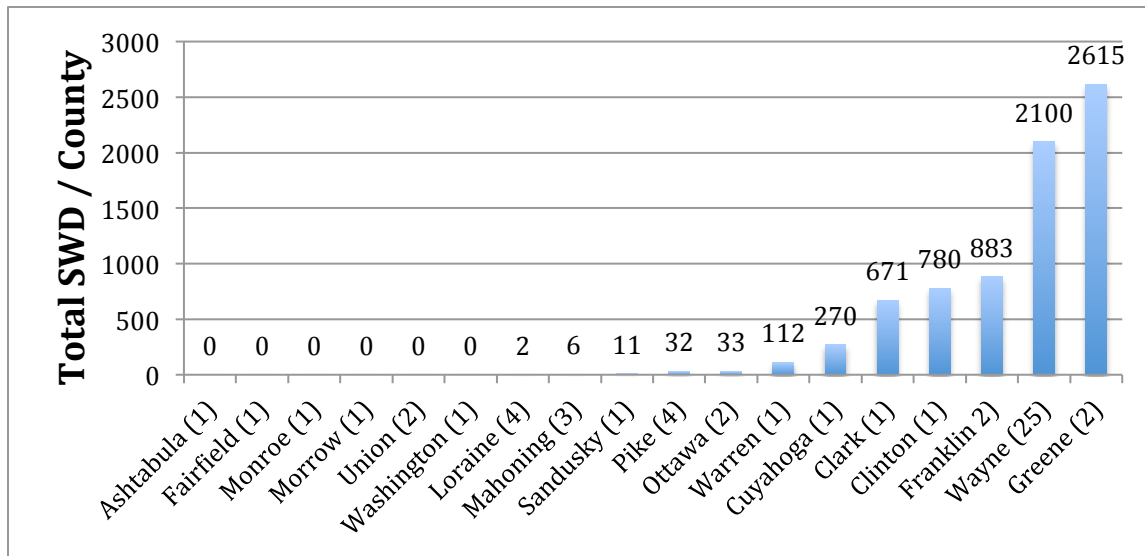


Figure 2. The total number of SWD flies captured in 2014 by county. The number of sites per county follows in parentheses.

Table 1. Fruit lots inspected for SWD larvae at Wayne County produce auction.

Fruit	Auction lots SWD positive	Auction lots SWD negative	% Positive
mulberry	0	2	0
elderberry	0	8	0
plums	0	1	0
garden huckleberry	0	1	0
ground cherry	0	1	0
grapes	3	32	9
blackberry	3	8	27
red raspberry	12	14	46

In our second monitoring network that was established for Brown Marmorated Stink Bug (BMSB), 11 counties actively trapped for this pest using pheromone baited black or yellow pyramid or PVC style traps at 15 sites. Nine of those counties reported capturing BMSB nymphs or adults (Figure 3). Crops monitored included raspberry, blackberry, grapes, apples, sweet cherries, and sweet corn. The first detection of BMSB occurred in Washington county during the week of June 15th. Most captures occurred between the first week of August and the middle of September. The total number of BMSB adults and nymphs captured is affected by the number of sites, traps, and length of trapping season in each county (Figure 4). There have yet to be reports of serious economic losses from this stink bug outside of an apple orchard located at the OSU research farm in Columbus but we continue to be vigilant of the

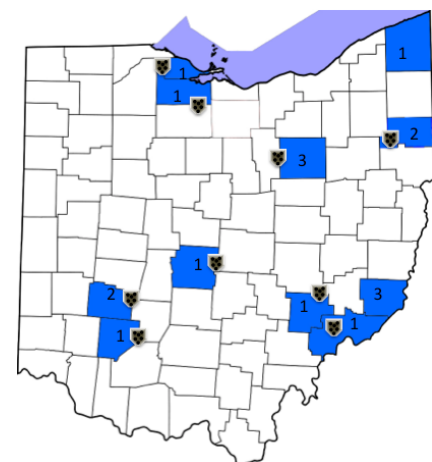


Figure 3. Counties in the 2014 Brown Marmorated Stink Bug network. Numbers within county indicate sites, bug symbol indicates where BMSB were trapped.

potential losses this pest can cause on fruit and vegetable crops, as documented by nearby states.

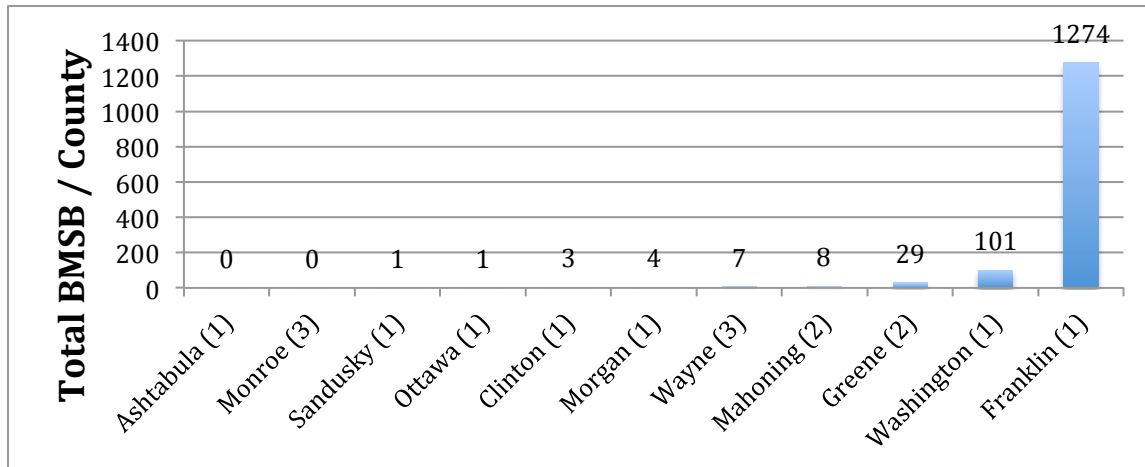


Figure 4. The total number of BMSB adults and nymphs captured in 2014 by county. The number of sites per county follows in parentheses.

2. Conduct workshop on Spotted Wing Drosophila identification, management, and monitoring.

On April 30th, the Dept. of Entomology and IPM Program conducted their 2nd annual SWD workshop for 29 growers and Extension educators. One of the focuses of the workshop was identifying male and female adult SWD, but proper trap monitoring techniques, biology and management were also emphasized. At the conclusion of the three hour workshop, each participant was given a utility caddy with all the monitoring supplies (apple cider vinegar, yeast, strainer, ethanol, vials, etc.) needed to set up at least two traps on their farm or in their county. Several of these growers did contribute their trap catch information to the overall monitoring network.

3. Implement a 24-48 hour rapid response protocol for Spotted Wing Drosophila cooperators.

This protocol was in place this year for our Extension educators to follow. Given the short life cycle of this pest (ca. 7-10 days from egg to adult), it was critical to sort through and identify any insects collected in the baited traps quickly to give the grower as much notice as possible if found to begin management procedures. Once SWD adults were detected at most sites, insect identification of samples was not a priority requiring a short turn around so specimens collected were placed in ethanol filled vials for later sorting. Most of those samples have been inspected for SWD at this point. Some of the growers in the network also contributed their data on a timely basis.

4. Provide 24/7 access to BMSB and SWD site trap data via MyTraps.com for fruit and vegetable growers.

This was our second year of trying to place trap data collected for these invasive pests on a commercial web service, MyTraps.com, so that easy access and visualization of pest populations could be given to growers. Although the concept of individual trap cooperators entering their own data as soon as they collect it is appealing to eliminate the bottleneck in uploading data, the overall system was not as user friendly as it needed to be in order for growers to easily enter their trap data. Although we worked intensively and extensively with the MyTraps technical support to

correct some of these issues, overall the system was plagued with too many user interface and data access issues that could not be resolved. As a consequence, we have decided to abandon this service and will seek another solution to entering and displaying trap data in 2015.

5. Update management and insecticide options on Spotted Wing Drosophila factsheet.

Dr. Celeste Welty updated and revised the factsheet associated with SWD biology, management, identification, trapping techniques, fruit damage, and insecticide recommendations on seven susceptible hosts in the spring. This colorful reference material was handed out to the participants of the SWD workshop in April. This factsheet has also been handed out at various field days and workshops throughout the summer, including at the OPGMA Summer Field Day. The factsheet is readily available online at

http://entomology.osu.edu/welty/pdf/SWD_Ohio_handoutV9.pdf.