Empire State Fruit and Vegetable Expo - 2013
Syracuse, NY

Title of session: Spotted Wing Drosophila
Speaker: Dr. Greg Loeb, Department of Entomology, Cornell University
Title of talk: Spotted Wing Drosophila in New York: Where we are and where we are heading

Summary: Spotted wing drosophila (SWD) *Drosophila suzukii*, originally from Asia, is a new invasive fruit pest that became established in NY and surrounding states in 2011. Unlike other fruit flies that typically only infest overripe and rotten fruit, female SWD oviposit in ripe fruit thereby making them unmarketable. Soft-skinned fruit are at greatest risk. In 2012 we monitored adult SWD and larval infestations for small fruit and stone fruit crops, and potential wild hosts through the season to determine crops at most risk, timing of infestation, spatial variability, relationship between adult captures and larval infestations, and role of wild hosts. Traps baited with apple cider vinegar were used to monitor adult SWD at multiple small fruit farms in NY, including traps placed at the edge or interior of various berry crops and in wood edges adjacent to fruit crops. Figure 1 summarizes adult capture results. SWD adults were not detected in these traps until early July and became wide-spread and abundant by mid-August. Overall, we captured more adults in traps on wood edges relative to crops and this was particularly true in the fall indicating a shift to wood sites, perhaps to seek overwintering habitat. However, traps in wood sites did not generally provide any earlier detection of SWD than traps in the crop.

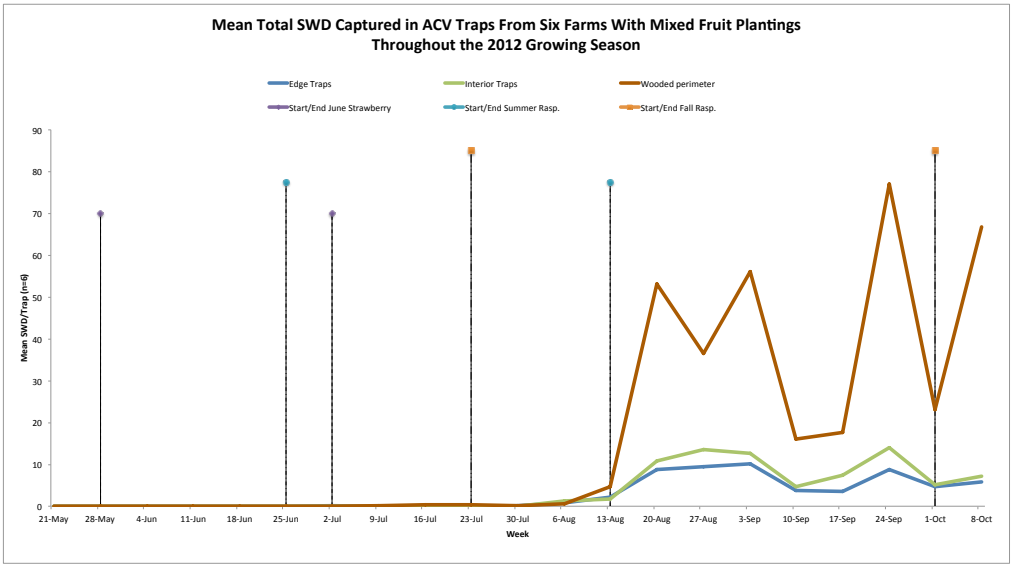

Figure 1. Mean total SWD captured in various fruit crop (combined for this figure) edges and interiors, and from wooded farm perimeters, from six Finger Lakes and Lake Ontario region farms, throughout the 2012 growing season. Standard ACV deli-cup traps were used and checked weekly.

Ripe fruit samples that were collected and held under insectary conditions provided some indication of host utilization and the ability of various fruit crops to support development

of SWD (Table 1). Rearing results should be interpreted keeping in mind factors related to the population dynamics of the SWD in relation to the fruiting season of the various crops and wild hosts. Fall raspberry and blueberry appeared to be the most utilized by SWD, but we reared SWD from a number of other fruit crops at lower levels. June-bearing strawberry escaped SWD infestation in 2012 while day-neutral strawberries in late summer were exploited. The most important wild hosts at the farms studied included dogwood, buckthorn, pokeweed and bush honeysuckle. Peaches and day-neutral strawberries appear to support SWD infestation, though damage was not as great as was found for raspberries and blueberries. By mid-August severe infestations were found and were reported across NY with timing of infestation development being rapid.

Table 1. Mean ± SE SWD per sample, other Drosophila per sample, and proportion of SWD reared from various possible SWD fruit hosts. Sampled from 7 different farms in the Finger Lakes Region, NY.

Host	N Rows	SWD Rank	Total SWD Mean/g ± SE	Total Other Fruit Flies Mean/g ± SE	Proportion SWD mean ± SE
Fall Raspberry	63	1	1.05 ± 0.22	0.17 ± 0.05	0.76 ± 0.04
Wild-Buckthorn	29	2	0.54 ± 0.16	0.06 ± 0.04	0.82 ± 0.09
Fall Raspberry (overripe)	2	3	0.49 ± 0.34	0.03 ± 0.03	0.96 ± 0.035
Blueberry	68	4	0.38 ± 0.12	0.08 ± 0.03	0.73 ± 0.06
Wild-Pokeweek	10	5	0.30 ± 0.12	0.07 ± 0.05	0.86 ± 0.09
Summer Raspberry	82	6	0.25 ± 0.07	0.11 ± 0.04	0.59 ± 0.07
Wild-Dogwood	5	7	0.17 ± 0.09	0.04 ± 0.02	0.86 ± 0.07
Grape-Syrah(damaged)	2	8	0.13 ± 0.13	0.0 ± 0.0	1
D-N Strawberry	58	9	0.09 ± 0.03	0.37 ± 0.16	0.34 ± 0.08
Grape-Concord (damaged)	37	10	0.08 ± 0.02	0.47 ± 0.07	0.14 ± 0.04
Wild-Cotoneaster	2	11	0.06 ± 0.06	0.0 ± 0.0	1
Wild-Honeysuckle	53	12	0.03 ± 0.02	0.10 ± 0.07	0.45 ± 0.21
Tunnel Raspberry	47	13	0.02 ± 0.007	0.37 ± 0.08	0.31 ± 0.06
Grape-Cabernet Franc (damaged)	18	14	0.02 ± 0.007	0.15 ± 0.06	0.25 ± 0.08
Grape-Baco	14	15	0.02 ± 0.008	0.017 ± 0.007	0.41 ± 0.16
Grape-Cayuga White (damaged)	6	16	0.01 ± 0.007	0.67 ± 0.41	0.20 ± 0.16
Peach	30	17	0.01 ± 0.008	0.14 ± 0.12	0.15 ± 0.14
Grape-Cabernet Franc	44	18	0.009 ± 0.005	0.11 ± 0.06	0.27 ± 0.11
Peach-drops	30	19	0.0029 ± 0.0023	0.11 ± 0.06	0.05 ± 0.05
Apple	9	20	0.003 ± 0.003	0.0 ± 0.0	1
Wild-Sumac	14	21	0.002 ± 0.002	0.0 ± 0.0	1
Grape-Cayuga White (damaged)	18	22	0.0019 ± 0.0015	0.02 ± 0.009	0.08 ± 0.07
Grape-Cayuga White	24	23	0.0009 ± 0.0007	0.78 ± 0.77	0.01 ± 0.0099
Grape-Concord	37	24	0.0008 ± 0.0005	0.087 ± 0.068	0.08 ± 0.07

Host	N Rows	SWD Rank	Total SWD Mean/g ± SE	Total Other Fruit Flies Mean/g ± SE	Proportion SWD mean ± SE
Grape-Chardonnay	24	25	0.0007 ± 0.0007	0.094 ± 0.092	0.17 ± 0.17
Apple-drops	14	26	0.0006 ± 0.0006	0.071 ± 0.04	0.02 ± 0.02
Grape-Niagara	25	27	0.0004 ± 0.0004	0.032 ± 0.030	0.08 ± 0.08
Apricot	2	28	0.0 ± 0.0	0.0 ± 0.0	
Grape-Cabernet Sauvignon	2	28	0.0 ± 0.0	0.0 ± 0.0	
Grape-White Table Grape	2	28	0.0 ± 0.0	0.0 ± 0.0	
June Strawberry	33	28	0.0 ± 0.0	0.28 ± 0.18	0.0 ± 0.0
Peach-Mummy	2	28	0.0 ± 0.0	0.017 ± 0.017	0.0 ± 0.0
Plum	2	28	0.0 ± 0.0	0.0 ± 0.0	
Sweet Cherry	7	29	0.0 ± 0.0	0.17 ± 0.17	0.0 ± 0.0
Wild-Climbing Nightshade	2	28	0.0 ± 0.0	0.0 ± 0.0	
Wild-Mushroom	2	28	0.0 ± 0.0	0.0 ± 0.0	
Wild-riparia	19	28	0.0 ± 0.0	0.0 ± 0.0	
Wild-Rosa spp.	6	28	0.0 ± 0.0	0.0 ± 0.0	
Wild-Washington hawthorn	2	28	0.0 ± 0.0	0.0 ± 0.0	

The 2012 field season was an awakening for many fruit growers to the threat of SWD. We conducted a grower survey in the fall of 2012 to assess impact of SWD. From the survey and additional discussions with industry representatives, it's clear this new pest caused major economic damage to some berry crops, particularly blueberries and raspberries. Indeed, a significant number of respondents to the survey indicated they were considering getting out of the business or shifting to less vulnerable crops. Insecticides were a primary method of management in combination with sanitation. Although SWD populations likely will decline over the winter, we anticipate that they will be back in full force in 2013. In the short-term, vigilance and rather intensive use of insecticides (with sanitation) will be necessary to keep SWD in check for vulnerable crops. Longer-term, research is continuing into the biology of SWD, improved monitoring techniques and development of alternative management approaches, such as biological control, repellents, and attract and kill devices.

I want to thank the many researchers, extension educators, and growers who worked with us during 2012 to address this new threat to berry production in NY. I also want to thank the New York Berry Grower's Association for their leadership in bringing the problem to the attention of policy makers in NY and nationally and helping to acquire the necessary funding to carry out our work.