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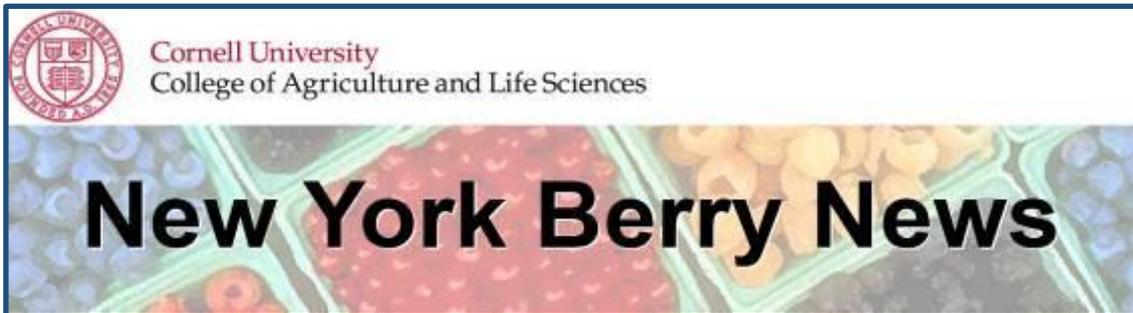
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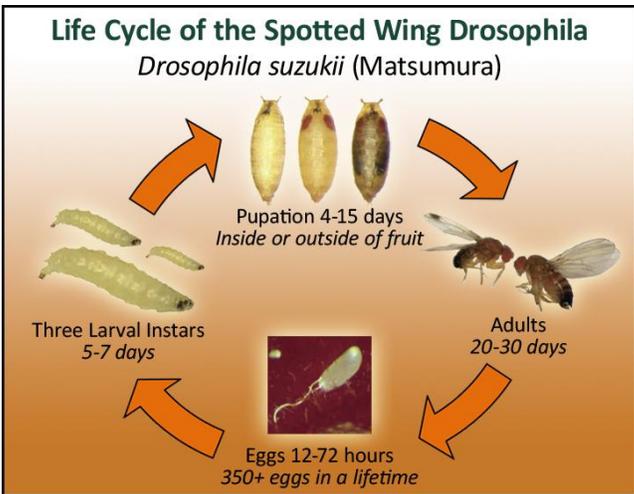
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Originally from Asia, spotted wing drosophila (SWD) first showed up in California around 2005 and has spread throughout the northern regions of the US. In 2011 SWD was reported throughout the Northeast, presenting economic loss well into the 2012 growing season. Because SWD female flies have very large and serrated ovipositors (the body part used to lay eggs), they are able to lay eggs in marketable fruit. This poses many growers with questions in regards to both controlling this pest as well as how to give consumers appropriate information. In this edition of New York Berry News we hope to answer any questions you may have.



Spotted Wing Drosophila

Q & A

- Is 2016 a bad year for SWD? (*page 3*)
- What crops are most vulnerable to SWD damage? (*page 3*)
- What are some signs that the fruit is infested? (*page 4*)
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Is 2016 a bad year for SWD?

The mild winter that occurred in New York probably contributed to overwintering success of SWD and early first detection in the spring. Various berry plants and wild hosts provided ample amounts of food for their early arrival. Despite this early arrival, however, populations did not grow as fast as observed in previous years. Hence, our data indicate that overall infestation of mid-season berry crops like summer raspberry and early to mid-season blueberry cultivars was lower than in some previous years. We believe this was due to the hot and very dry summer we have been having until recently. Now that we are getting some rain, population levels and infestation rates are likely to go up, at least until early October when SWD begins to go into reproductive diapause.

What crops are most vulnerable to SWD damage?

Soft skinned fruit including raspberry, blackberry, blueberry, and strawberries (day-neutral cultivars in late summer, not June-bearing cultivars) are the most vulnerable. Cherry and grape plants may also be at risk for infestation, especially if fruit is cracked. There are also various wild hosts as well, including bush honeysuckle, wild raspberry and blackberry, wild blueberry, dogwood, pokeweed and elderberry; especially those that fruit in late summer. A complete list of susceptible hosts can be found at <http://www.fruit.cornell.edu/spottedwing/cropshosts.html>



What are some signs that the fruit is infested?

A quick visual scan of the crop could display fruit that is softer than normal or softer than you would expect when ripe. Fruit can also have sunken areas or areas that appear to be dull and not as “fresh” looking. These can be signs of initial infestation. Sometimes the fruit will have droplets of berry sap due to egg laying sites which in turn could promote the growth of mold. In raspberries, wetness inside the receptacle after picking can also indicate infestation. If there are high levels of infestation, certain fruits, such as raspberries, may appear to be “melting” off of the plant. Examples with pictures can be found at

<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/19525/em9021.pdf> .

How does one know if SWD are in the area?

Monitoring networks are in place throughout NY which report any SWD finds according to county. There is also a SWD blog available which posts first find catches as well as SWD monitoring information. Growers can make or purchase lures and traps (see below). You can also monitor the presence of SWD in ripe fruit with salt flotation. An in-field salt flotation is done by collecting healthy/harvestable fruit and placing them in a bag full of salt solution, waiting 15 minutes, and seeing if any larvae have emerged. Larger larvae will be easier to see than small larvae, but may require a hand lens or microscope to easily observe. The protocol is below.

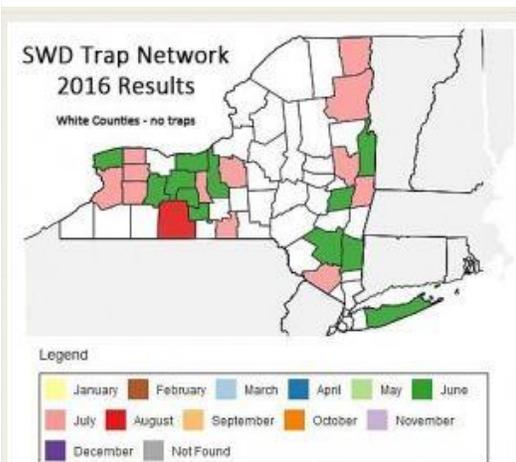
SWD blog: <http://blogs.cornell.edu/swd1/>

Monitoring information and SWD Monitoring Network map:

<http://www.eddmaps.org/swd/index.cfm>

Salt flotation in the field:

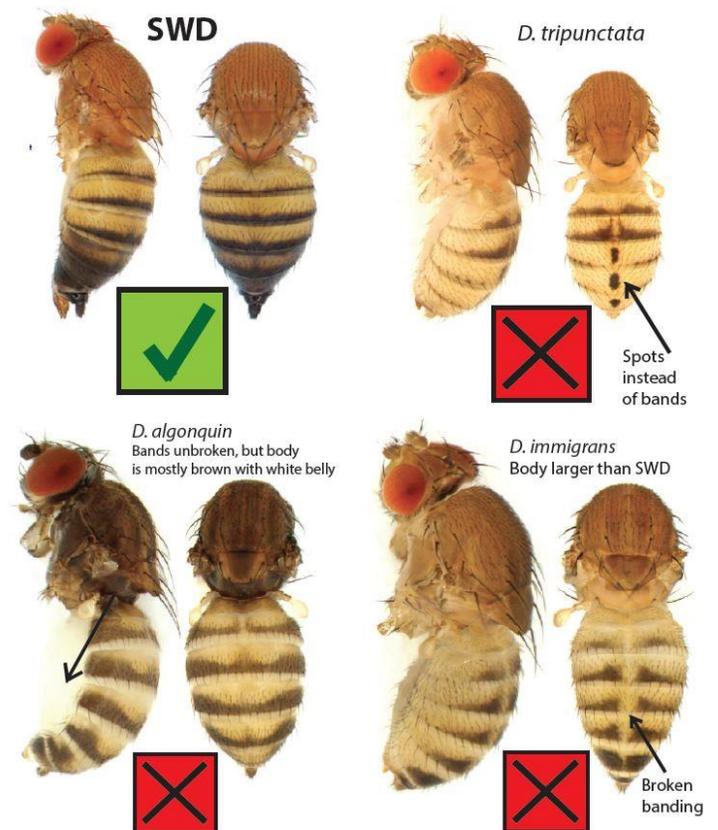
<http://www.fruit.cornell.edu/spottedwing/pdfs/SaltFloatation.pdf>



Distribution map for SWD, with data contributed by the SWD network operated by 25 Cornell University and Cornell Cooperative Extension scientists in 25 Counties, monitoring 117 traps.

How does one know if the flies they are seeing are SWD or the regular fruit fly?

Because these are flying insects, visual inspection of flies in the field is tricky unless they are caught. There are traps that you can make to lure and capture flies. Collecting trap contents allows you to visualize the fly body parts and determine whether or not it is SWD. If you are very concerned about the presence or absence of SWD you can contact your local pest management or research extension lab (<http://www.hort.cornell.edu/grower/nybga/swd/pdfs/Monitoring/SWD%20ID%20VerificationLabs.pdf>). They may be able to set up traps for you or have you send weekly trap collections to their labs. If you would like to monitor your crops via traps, there is an easy to make SWD trap with instructions at http://www.fruit.cornell.edu/spottedwing/pdfs/SWDTraps_CornellFruit.pdf. There are various fact sheets available to help with identification, including a Quick Key for SWD (http://www.hort.cornell.edu/grower/nybga/swd/pdfs/Monitoring/SWD_Quick_Key.pdf), SWD imitators (<http://www.ipm.msu.edu/uploads/files/MSU-SWD-ID.pdf>), and Managing SWD in your Home Garden (<http://www.fruit.cornell.edu/spottedwing/pdfs/SWDgarden.pdf>). There are other helpful links at the end of this Q&A. You can also purchase commercially made traps and lures (e.g. Scentry has worked as well or slightly better than homemade traps and lures in research trials).



Picture from "Spotted Wing Drosophila Quick Key" - Greg Loeb

http://www.hort.cornell.edu/grower/nybga/swd/pdfs/Monitoring/SWD_Quick_Key.pdf

What is a typical spray program for SWD?

Insecticide treatments should begin when susceptible fruit crops begin to ripen and SWD has been detected through monitoring. It is recommended on the Cornell Fruit Page (<http://www.fruit.cornell.edu/spottedwing/mgmt.html>) “to apply insecticides at least every seven days and repeated in the event of rain. Choose the most effective insecticides with pre harvest intervals that work for your picking schedule. Rotate insecticides according to their modes of action.” Reading labels and avoiding times of day when pollinators are active is also recommended.

A list of labeled Insecticides for Control of Spotted Wing Drosophila in New York Berry Crops can be found here: <http://www.fruit.cornell.edu/spottedwing/pdfs/swd-insecticides-berries-ny.pdf>

And for stone fruit and grapes: <http://www.fruit.cornell.edu/spottedwing/pdfs/swd-insecticides-grapes-treefruit-ny.pdf>

Are there organic alternatives?

Yes- organic alternatives can be found on the insecticide tables via <http://www.fruit.cornell.edu/spottedwing/pdfs/swd-insecticides-berries-ny.pdf> and <http://www.fruit.cornell.edu/spottedwing/pdfs/swd-insecticides-grapes-treefruit-ny.pdf> . Any insecticide with the symbol “^” is approved for organic use in NY. These include insecticides such as Entrust 80WP Naturalyte, Entrust 2SC (2ee), and Pyganic EC 1.4. Entrust has provided moderately good control while Pyganic has not been very effective in research trials. Make sure to look at any details within the insecticide tables to ensure you are following correct protocols.

*Refer to label for details and additional restrictions.

*Adding sugar (sucrose) at 2 lb/100 gal water as a feeding stimulant will increase efficacy.

^Approved for organic use in NY.

©After two consecutive applications must rotate to different mode of action.

¹ Active Ingredient.

² Mode of Action, based on IRAC group code.

³ Re-entry Interval.

⁴ Days to Harvest.

Example of symbol key found at the bottom of each insecticide table.

What can a grower do, besides spraying, to reduce or eliminate SWD?

Management of SWD can be accomplished through a number of practices, including monitoring, identification, and control. By monitoring for the pest you are able to better understand when they have arrived as well as in which area of your farm. By clean picking, practicing excellent sanitation, and harvesting all ripe fruit you can reduce the number of SWD. Each of these steps will help create an unfavorable environment for SWD. If you are able to pick up after you-pick customers and after rain storms you can decrease the presence of rotting fruit. Another way to reduce the presence of SWD is by making sure any old fruit is not stored in fields or nearby areas. The old fruit will become an environment for SWD to lay more eggs. Because SWD have a large number of hosts, removing any potential wild hosts surrounding your crop and farm may help reduce SWD populations, although more research is needed on this question. Maintaining a well-groomed, more open canopy can also help reduce SWD because they prefer a cool shaded environment (it can also improve spray coverage). Exclusion netting can be used to cover susceptible crops, but you must keep an eye out for any tears or openings. A final and important way of eliminating SWD is by storing harvested fruit in a cool or refrigerated area as soon as possible. This will greatly reduce the chance of SWD eggs and larvae developing.

Do SWD larvae pose a health risk to consumers?

No, although the thought of accidentally eating larvae is unappetizing, they are not harmful. And as far as we can tell, they don't affect taste either, but this has not been carefully studied. By chilling the fresh fruit as soon as possible, coupled with frequent harvest, growers can greatly reduce the chance of larvae developing.

What should I tell customers who find SWD larvae in their fruit?

It will be important to let customers know that while seemingly unappetizing, SWD are not harmful. In order to avoid finding SWD in fruit, chill your fresh fruit as soon as possible. This will slow or even stop the development of eggs and larvae.

Other SWD resources available:

NY distribution map: <http://www.fruit.cornell.edu/spottedwing/dist.html>

List of SWD first catch according to county: <https://blogs.cornell.edu/swd1/category/swd-reports/2016-trap-network/>

SWD Invasive Species and Exotic Pests factsheet:

<https://ecommons.cornell.edu/bitstream/handle/1813/42883/spotted-wing-drosoph-NYSIPM.pdf?sequence=1&isAllowed=y>

SWD Biology and life cycle:

http://www.hort.cornell.edu/grower/nybga/swd/pdfs/Biology/SWDbiolifecycle_2014.pdf

Method for sorting SWD in lab setting:

http://www.hort.cornell.edu/grower/nybga/swd/pdfs/Monitoring/SWD_Sorting_Method_Trap_Catch.pdf

Scentry SWD trap and lure:

<http://www.greatlakesipm.com/SCENTRY%20SPOTTED%20WING%20DROSOPHILA.html>

Upcoming Events

- Tuesday, October 4, 2016** "Mid-Season" Biocontrol Workshop for Growers
http://events.cornell.edu/event/mid-season_biocontrol_workshop_for_growers
- Tuesday October 4 -** The National Forum on Climate and Pests
Thursday October 6, 2016
<http://www.northeastipm.org/about-us/signature-programs/national-forum-on-climate-and-pests/>
- Tuesday, October 11, 2016** Biocontrol for Growers, Educators, and Consumers
http://events.cornell.edu/event/biocontrol_for_growers_educators_and_consumers
- Monday November 7 -** NC Strawberry Association – Southeast Strawberry Expo
Wednesday November 9, 2016
<http://ncstrawberry.com/>
- Sunday December 4 -** North American Berry Conference
Tuesday December 6, 2016
<http://www.raspberrylblackberry.com/>
- Tuesday January 17 -** 2017 Empire State Producers Expo
Thursday January 19 2017
<http://nysvga.org/expo/information/>
- Tuesday February 21, 2017** Ontario Berry Growers Association annual meeting and conference
<http://ontarioberries.com/site/growers-and-members.html>
- Wednesday February 22 -** Ontario Fruit and Vegetable Convention
Thursday February 23, 2017
<http://www.ofvc.ca/>

Berry Budgets

The budgets presented below are estimate production costs and returns for the berry crops in New York State in 2014. **Each budget includes cost for the pre-plant, planting, and full production years.** Members of the New York State Berry Growers Association reviewed the budgets to ensure they reflected actual experience on New York farms.

[Strawberries \(PYO June-bearing\) - returns to risk and management](#)
[Strawberries \(PYO June-bearing\) - production year budget](#)
[Blueberries - returns to risk and management](#)
[Blueberries - production year budget](#)
[Raspberries \(Florican, summer-bearing\) - returns to risk and management](#)
[Raspberries \(Florican, summer-bearing\) - production year budget](#)

“Labor is the largest cost on berry farms, representing 80% of the costs. With this in mind a labor and machinery budget was created for each crop and year. These budgets break down the costs for the tasks involved in growing berries, and can help to identify where there are opportunities to reduce costs or substitute machinery for labor.

Budgets were based on typical production practices in New York State for strawberries, blueberries, and raspberries. The strawberry budget is for growers growing June-bearing strawberries in a matted-row system. For the raspberries a planting life of 10 years was assumed, and for blueberries the planting life was assumed to be 25 years. The establishment costs were spread out over the life of the planting in the production year budget, so growers can see how those costs can be recovered.

For additional production information, please see the other pages on the berry site or contact your local Cooperative Extension office. To avoid giving specific pesticide recommendations that might not be effective for a particular farm or situation, the pesticide costs were based on an average spray program from the Cornell Pest Management Guidelines for Berry Crops. If you need more detailed pesticide information, consult the guidelines or with Cooperative Extension.

Using data from the 2012 NYS Berry Pricing Survey, and the expenses from the enterprise budget, a breakeven analysis was developed based on different yield and price assumptions. This information can be found in the “Returns to Risk and Management” document. A grower can use this to determine the price they need to charge to cover all their costs at a given yield per acre, or to know what their crop should yield to begin making a profit at a certain price.

These budgets can be used as a guide for growers to determine production costs and returns for berry crops in New York State. The assumptions in the budgets may be different for each farm and area of the state because of variations in production practices, input costs, and prices received by growers. A “My Cost” column is included to the right of the sample costs in each budget. Growers can enter their actual costs for each item in the budget to get a more accurate picture of their true cost of production.”

This work was supported by the New York Farm Viability Institute Project #AIC 12-00: “Building a Better Bottom Line for NYS Berry Growers”

Original post can be found at: <http://www.fruit.cornell.edu/berry/budgets/>

Spotted Wing Drosophila (*Drosophila suzukii*): Updates From Global Research

Tess Grasswitz, Extension Associate, Lake Ontario Fruit Program, Cornell Cooperative Extension
Originally published in Fruit Notes, Vol 16, Issue 18, August 18, 2016

Introduction

Spotted wing drosophila (SWD) is native to South East Asia. It was first recorded as an invasive species in Hawaii in 1980, and in both California and parts of Europe in 2008. Since then it has spread rapidly



throughout temperate North America and Europe, mainly due to global trade combined with an initial lack of regulatory controls. Its annual rate of range expansion has recently been estimated at approx. 1000 km (~620 miles) per year, and it is now established in parts of South America and the Middle East.

As a result of its global economic impact, spotted wing drosophila is the target of an intense global research effort encompassing various aspects of its biology and control. This article summarizes the results of some of this recent research that offers potential for the development of future pest management strategies. Please note that these reports do not constitute recommendations at this stage.

Summary of life-cycle

Spotted wing drosophila overwinters as a specialized (darker) adult morph that has greater cold tolerance than the summer form. Overwintered flies emerge in spring and feed on nectar from early flowering weeds and crops. Overwintering adults may live for more than 200 days, but the longevity of the summer form is considerably less. Reproductively mature female flies lay eggs in the ripening fruits of a wide range of host plants, including many wild, uncultivated species. Each female may produce 100–400 eggs, laying approximately 20 per day (depending on host availability and environmental conditions).

Recent research from Italy has shown that spotted wing drosophila can complete its lifecycle at temperatures as low as 53 °F; however, adult activity is highest at temperatures between 68 and 77 °F, and is reduced at temperatures above 86 °F. Adults are most active at dawn and dusk.

Larvae develop inside the fruit and complete their development in 3-13 days (depending on temperature). Pupation can occur in the fruit or in the soil, and the entire life-cycle can be completed in

approx. 7–10 days (again, depending on temperature). Under optimal conditions, up to 13 generations per year are possible, although in the US and Canada 3–9 generations are more typical. Canadian research suggests that the lower lethal temperature for adult flies is in the region of 19 °F, although cold tolerance depends on the extent of prior exposure to fluctuating cool temperatures. There is evidence to suggest that females are more cold-tolerant than males.

Recent research results

i. Host plants

Fruits of susceptible host plants are liable to attack as soon as the fruit begins to soften and show color. Research with both raspberries and blueberries has shown that green, hard fruits are not at risk. The likelihood of egg-laying increases as the force needed to penetrate the fruit decreases: hence egg-laying is consistently high in raspberry and other thin-skinned fruits. In a recent US study, calcium treatments applied to blueberries in a field experiment produced firmer fruits that harbored fewer SWD eggs than fruits from untreated plots.

The wide host plant range of spotted wing drosophila can influence population levels at the landscape scale. In one US study, the abundance of wild hosts in nearby woods and hedgerows was implicated in the increased early-season risk of spotted wing drosophila in adjacent raspberries. However, it did not appear to influence the subsequent rate of population development in those crops.

As an indication of the wide host plant range of spotted wing drosophila, in recent field surveys in Europe, more than 24,000 adult flies successfully emerged from the fruits of 84 plant species from 19 different plant families, 38 of which were non-native species. The highest infestations were found in species of *Cornus* (dogwoods), *Prunus* (relatives of stone fruits such as cherries, plums, etc.), *Rubus* (raspberries, blackberries, and relatives), *Sambucus* (elderberry) and *Vaccinium* (blueberries and relatives). US research has shown a similarly wide range of hosts, including many of the above, as well as *Morus* (mulberry), edible blue honeysuckle (also known as haskap or honeyberry), and some common herbaceous weeds such as *Solanum dulcamara* (bittersweet nightshade). In Europe, spotted wing drosophila has also been found infesting mistletoe berries (*Viscum album*) – probably one of the earliest host fruits available for spring egg-laying.

In another European study, the fruits of several plants stimulated egg-laying by SWD females, but did not support full larval development and successful adult emergence. If these lab reports are supported by future field studies, such plants might be a useful component of an integrated control strategy as trap plants or so-called 'dead-end' hosts. For such an approach to be successful, however, the fruits must either be significantly more attractive than the crop being protected, or be present either earlier or later than the fruits of the target crop.

ii. Interactions with yeast

Once mated, adult female spotted wing drosophila respond strongly to odors produced by wild yeast species associated with fruit. These yeast odors are used as feeding cues, and may form the basis for developing an “attract-and-kill” strategy: in recent research, exposing flies to a mixture of yeast and insecticide reduced egg-laying and increased the mortality of adult flies compared to insecticide treatments alone. However, related work has shown that the effect is dependent on both the insecticide used, and the species of yeast. In some cases, there was no additional benefit from adding yeast to an insecticide spray that was also supplemented with cane sugar.

A rather more advanced approach to exploiting the attraction of SWD to yeasts involves the use of a genetically modified yeast strain to disrupt the expression and regulation of some of the pest’s critical genes by interfering with the normal functioning of its ribonucleic acid (RNA). Such ‘RNA interference’ techniques (RNAi) are being developed for many important crop pests. Recent lab-based research in California involved feeding a genetically modified yeast strain to adult spotted wing drosophila and recording mortality, activity and post-treatment egg-production: while there was no increase in fly mortality as a result of the treatment, the flies were less active and laid fewer eggs, prompting speculation that further refinements of the technique might have a future role in pest management.

iii. Environmental factors

Previous research has shown that SWD trap catches decline when humidity is low. Several research groups are now investigating whether different pruning and irrigation practices can reduce within-crop temperature and humidity and hence slow the rate of SWD population increase. Other research groups are comparing the survival of SWD in blueberry plantings with or without black plastic weed mats: the higher temperatures associated with the mats may reduce the survival of pupae in infested fruit that falls to the ground.

iv. Biological control

Various research groups in both North America and Europe have addressed the possible impact on spotted wing drosophila of both native natural enemies and a range of commercially available predators, parasitic nematodes and fungal pathogens. However, many of the studies have been conducted only under laboratory conditions and the results have been rather variable.

Two species of parasitic wasps (parasitoids) (*Trichopria drosophilae* and *Pachycrepoideus vindemiae*) have been found attacking SWD pupae in both the USA and Europe, as well as in the pest's native range (various parts of Asia, including Japan and Korea). *Trichopria drosophilae* has a narrower host range than *P. vindemiae* and may have potential for mass-rearing for use in augmentative release programs. Additional parasitoids collected from South Korea are currently undergoing evaluation under quarantine in California, but it will be some time before such tests are completed.

v. Chemical control

At present, commercial producers rely heavily on season-long applications of a rather limited range of insecticides for spotted wing drosophila. With a pest such as this, with rapid rates of development and multiple generations per year, the risk of selecting for insecticide resistance is high. This is particularly true for enclosed tunnel systems (because of limited fly movement) and in organic plantings, where there are few effective chemical control options. There is already some evidence of reduced susceptibility to spinosad (Entrust®) in some organically managed berries in the western US. On the other hand, a recent study in Canada showed no increase in resistance to malathion in a laboratory population of SWD exposed to sub-lethal concentrations for 30 generations. Baseline monitoring for resistance to the most widely used insecticides is currently being conducted in fruit-producing regions in various parts of the US. Such monitoring will provide a valuable early-warning system if and when resistance develops.

In the meantime, a recent report from Georgia on the efficacy of insecticides used for SWD in blueberries showed that the adjuvant Nu Film P had some effect on prolonging the activity of spinetoram and spinosad after a simulated rainfall equivalent to 0.5", and of malathion after a rainfall of approx. 1". Nu Film P is listed by the Organic Materials Review Institute (OMRI) as suitable for use in organic production.

In conclusion, the heavy investment in research on spotted wing drosophila is now starting to produce results that at the very least will provide some additional management tools, and which in future may form the basis of a multi-tactic, integrated approach to the management of this pest.



National Forum on Climate and Pests

As Climate **Shifts,**
So Do **Pests**

October 4–6, 2016
Washington, DC & the Internet



The National Forum on Climate and Pests will bring invited experts together in front of a live Internet audience to speak about the latest climate change science and pest research.

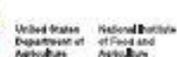
What can studies about climate tell us? How are pests responding? What will these changes mean for agriculture, forestry, or the homeowner?

These questions (and more) will guide our dialogue. We will discuss commonalities, identify gaps in knowledge, and initiate strategic planning.

We invite you to participate in this forum on **October 4–6, 2016.**

Organized by the Northeastern IPM Center in cooperation with:

Northeastern
IPM
Center



Learn more at neipmc.org/go/nfcp

Photo credits: Brown Marmorated Stink Bug (*Halyomorpha halys*) by Gary Beeson, USDA APHIS. Potato Leafhopper (*Erioposia fabae*) by Steve L. Brown, University of Georgia. All other photos from Moogafelis.com.

2016 Southeast Strawberry Expo Registration

❖ November 7-9, 2016 ❖ Register in advance to avoid \$25 penalty ❖

NOW OFFERING ONLINE REGISTRATION: WWW.NCSTRAWBERRY.COM

CONTACT INFORMATION

Name(s) (for name tags): _____

 Farm/Business: _____
 Mailing Address: _____
 City: _____ State: _____ Zip: _____
 Home Phone: _____
 Cell Phone: _____
 Farm/Work Phone: _____
 Email: _____
 Website: _____
 Acres of strawberries grown in 2016: _____
 I'd like my newsletters via: Email Mail
 Bringing an item for the silent auction? Tell us here:

PAYMENT INFORMATION

Please select payment method:
 Check (payable to NC Strawberry Association or NCSA)
 Visa Mastercard Discover
 Card #: _____ Exp: _____
 Name on Card: _____

HOTEL INFORMATION

Hilton North Raleigh/Midtown
 3415 Wake Forest Rd. Raleigh, North Carolina 27609



Hotel room at the group rate of \$129.00

Deadline for hotel reservations is:

Monday, October 17, 2016

BOOK RESERVATIONS BY PHONE:
 1-800-371-8104, ask for reservations department
 Mention Group Code: NCSA

BOOK ONLINE:
http://www.hilton.com/en/hi/groups/personalized/R/RDU/HHF-NCSA-20161107/index.jhtml?WT.mc_id=POG

NCSA MEMBERSHIP

(good through November 2017 - you must be a member to attend expo)

TYPE	RATE	QUANTITY <small>(one per farm)</small>	TOTAL
In-State	\$100		\$
Out-of-State	\$170		\$
Student/Ext.	\$25		\$

FULL CONFERENCE REGISTRATION

(includes all breakout sessions, Tuesday lunch, all breaks)

TYPE	RATE	QUANTITY	TOTAL
First Registrant	\$150		\$
Additional Person	\$125		\$
Student/Ext	\$100		\$
Child	\$75		\$

TUESDAY ONLY (11/8)

(includes Tuesday breakout sessions, lunch, and breaks)

TYPE	RATE	QUANTITY	TOTAL
First Registrant	\$100		\$
Additional Person	\$85		\$
Student/Ext	\$60		\$
Child	\$50		\$

WEDNESDAY ONLY (11/9)

(includes Wednesday breakout sessions and break)

TYPE	RATE	QUANTITY	TOTAL
First Registrant	\$70		\$
Additional Person	\$60		\$
Student/Ext	\$40		\$
Child	\$35		\$

FARM TOUR (MONDAY, 11/7)

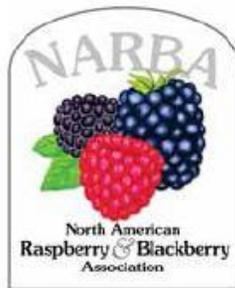
TYPE	RATE	QUANT.	TOTAL
On bus (lunch & dinner)	\$85		\$
Own car (dinner only)	\$60		\$
Child	\$35		\$

Donation to Scholarship Fund: \$ _____

TOTAL AMOUNT DUE:

Please add totals from all columns \$ _____

MAIL THIS FORM TO:
 NCSA, PO Box 543, Siler City, NC 27344
FAX TO: 919-742-5259
EMAIL TO: info@ncstrawberry.com
PHONE: 919-537-2287



North American Berry Conference December 4-6, 2016 – Grand Rapids, Michigan

in association with the Great Lakes Fruit, Vegetable, and Farm Market Expo

OVERVIEW

This conference is a joint meeting with the North American Strawberry Growers Association. Our activities December 4-5 will be held at the Amway Grand Plaza Hotel in downtown Grand Rapids. Our December 6 sessions are embedded in the Great Lakes Expo. These sessions, the many other Expo educational sessions and the Expo trade show will be held at the adjoining DeVos Place Convention Center (303 Monroe Avenue NW). Over 4000 attendees and 450 exhibitors typically participate in the Great Lakes Expo.

HOTEL RESERVATIONS

Make hotel reservations immediately; they can be hard to get. The following host hotels all connect to DeVos Place Convention Center through enclosed walkways. Mention group code GREAT LAKES EXPO:

Amway Grand Plaza, 187 Monroe Avenue NW, 800-253-3590, 616-774-2000; convention room rate is \$118 for up to four persons. Free self-parking in the Amway's ramp if your room is reserved at the convention rate.

Courtyard by Marriott Downtown, 11 Monroe Avenue NW, 877-901-6632, 616-242-6000; convention room rate is \$122 for up to four persons. \$10/day self-parking.

JW Marriott, 235 Louis Street NW, 877-901-6632, 616-242-1500, Convention room rate is \$168 for up to four persons. \$10/day self-parking. Additional hotels further away also offer convention rates. See www.glexpo.com/attend-register/location-lodging

TRAVEL

Flying: Gerald R. Ford International Airport (GRR), located about 20 minutes southeast of downtown, serves Grand Rapids. None of the downtown hotels operate airport shuttles. Metro Cab (616-827-6500) offers curbside service available outside Door 4 at the airport. The fare to downtown Grand Rapids is approximately \$35 one way.

Driving: Free self-parking is offered by the Amway Grand for registrants with reservations at the hotel. The other nearby hotels have daily parking fees. For more information visit www.glexpo.com/attend-register/driving-parking-flying

REGISTRATION

Conference registration is being handled by the Great Lakes Expo. You can register on paper with the form here, with the form in the Expo preconference booklet, or online at www.glexpo.com. Our conference is shown in Expo materials as a "preconference activity." Berry Conference registration includes the Sunday evening reception, the Monday program, and continental breakfast and lunch on Monday. To attend Tuesday's Berry Conference sessions you must also register for the Great Lakes Expo. Your Expo registration gives you access to its huge trade show and all other educational sessions Tuesday-Thursday. There is no Tuesday-only option.

NARBA/NASGA members receive a registration discount to the Berry Conference and the workshops. You may join or renew your membership with your registration.

Pre-register by **November 16** for lower registration fees. Your receipt, name badge and any special event tickets will also be mailed to you prior to the Expo, saving you time at arrival. On-site registration will be available, but lunch Dec. 5 and workshops cannot be guaranteed for walk-ins.

WORKSHOPS

■ **Getting Started in Raspberries and Blackberries** Tuesday, Dec. 6, 9:00-12:00. For novice and potential growers. The workshop covers the basics from site selection and planting through harvest and marketing. It will be led by Dr. Marvin Pritts (Cornell), and Dr. Eric Hanson (Michigan State). Participants will receive a USB drive of resource materials. Registration limited. \$20 fee to members, \$25 non-members.

■ **Create a Food Safety Plan for Your Farm – right here and now** (Tuesday, Dec. 6, 2:00-4:30) Even growers who do not need GAPs certification need a plan! Oriented especially towards raspberry, blackberry, and blueberry growers, but will be helpful to any smaller-scale produce grower with limited food safety experience or training. Leader Megan Shoenfelt is both a Food Safety auditor and a small-scale raspberry producer. Fee covers packet of handouts and worksheets. Registration limited. \$15/members, \$20/non-members.

KEYNOTE

Britt Burton-Freeman will speak on berry health benefits. Dr. Burton-Freeman is the Director of the Institute for Food Safety and Health's Center for Nutrition Research at the Illinois Institute of Technology. Her current research interests are in mitigating disease processes through dietary approaches focused on health promoting properties of foods. Specific disease targets include cardiovascular disease, metabolic syndrome and obesity.

POSTERS

Posters are invited for both the Berry Conference and the GL Expo. The "presenting" author will receive complimentary Expo registration. Learn more at www.raspberryblackberry.com/submitting-a-poster/

Visit www.raspberryblackberry.com and www.glexpo.com for more details, updates, and links to online registration



The Amway Grand Plaza from the Grand River in Grand Rapids.

Sunday, December 4 – at the Amway Grand Plaza			
2:00-5:30	NARBA and NASGA Board Meetings		
7:00-9:00	Opening Reception and Exhibits		
Monday, December 5 – at the Amway Grand Plaza			
7:30-9:00	Continental Breakfast in Exhibit Area		
9:00-10:30	General Session: Grower Spotlight: Bardenhagen Berries (Michigan) "Heart health, obesity, and diabetes: Berries can make a difference" <i>Britt Burton-Freeman</i>		
	Caneberry	Tunnels / Organic	Strawberry
10:45-12:00	Exclusion netting and harvest frequency for SWD management Sustainable options for disease management in caneberries	Choosing tunnel plastics to meet your needs Potential effects of tunnel plastics on pesticides and pest management Approaches for blackberry production in high tunnels	Biofungicides and organic options for disease control in strawberries Tackling tough weeds in strawberries
12:00-2:00	Lunch and NARBA/NASGA Annual Meetings		
2:00-3:30	The expansion of primocane-fruited blackberry production – From idea to reality Wholesale production: What are caneberry shipper/ marketers looking for? Marketer Panel	Grower experiences with high tunnels: Panel discussion	Managing Spotted Wing Drosophila in Strawberries – What Works Sprayer technology for strawberries Strawberry varieties – Grower panel
3:45-5:00	Intensive trellising improved our bottom line Getting two crops from your raspberries: Does it make economic sense?	Using high tunnels for organic raspberry production in humid regions Organic berry production: Grower panel	What Facebook has done for our farm Technology/smart phone apps: Growers share what works for them
6:00-	Dinner on your own		
7:30-8:30	Evening Roundtable on Production Issues Join in to this open, moderated discussion.		
8:00-11:00	Berry Conference Hospitality Room, Amway Grand Plaza		
Tuesday, December 6 – at DeVos Place Convention Center (Great Lakes Expo)			
Also at the Great Lakes Expo on Tuesday: Trade show, sweet corn, farm markets, food safety, greenhouse production, cucumbers, tomatoes, and more.			
	Caneberry	Workshops	Strawberry
9:00-12:00	Grower spotlight: K & K Farm (Michigan) Bramble varieties for today & tomorrow Arkansas blackberry varieties – What are people planting and why? How the National Clean Plant Network helps growers Virus diseases and their management	Getting Started in Raspberries and Blackberries. For novice and potential growers. Limited registration; pre-registration recommended	Silica treatments for strawberry disease control Emerging technologies – How can these help strawberry growers Getting the most out of your irrigation system Home-grown innovations – Show and tel
12:00-2:00	Lunch, visit trade show		
2:00-4:30	SWD management update and new research Sprayer technology for caneberries Growing blackberries in a colder climate: Grower panel	Create a Food Safety Plan for Your Farm – Right here and now Limited registration; pre-registration recommended	Soil health assessment / Soil health and composts Building soil health for perennial crops Intro to substrate culture: Top ten principles for growing strawberries in substrate Low tunnels for plasticulture strawberries
8:00-11:00	Berry Conference Hospitality Room, Amway Grand Plaza		
Wednesday - Thursday, December 6-7 – at DeVos Place Convention Center (Great Lakes Expo)			
Great Lakes Expo trade show and educational sessions on many topics. See program details at www.glexpo.com			

Look Who's Talking

This list contains many, but not all, of the presenters at the Berry Conference.

Research and Extension: Hannah Burrack, NC State University • John Clark, University of Arkansas • Kathy Demchak, Penn State University • Jason Deveau, Ontario Ministry of Food & Ag. • Pam Fisher, Ontario Ministry of Food & Ag. • Britt Burton-Freeman, Illinois Institute of Technology • Eric Hanson, Michigan State University • Rufus Isaacs, Michigan State University • Bob Martin USDA-ARS (Corvallis) • Marvin Pritts, Cornell • Annemiek Schilder, Michigan State University • Yannis Tzanetakis, University of Arkansas • Bernie Zandstra, Michigan State University
 Growers: Gary Bardenhagen (Michigan) • John Cooper (Ontario) • Kevin Edberg (Minnesota) • Tom Heeman (Ontario) • George Elder (Kansas). Shirley Klein (New Jersey) • Fred & Linda Koenigshof (Michigan) • Nate Nourse (Massachusetts) • Dale Illa Riggs (New York) • Megan Shoenfelt (Ohio) • Blaine & Leonna Staples (Alberta), Daniel Trudel (Ohio) • Bernie Ware (Michigan)

2016 NORTH AMERICAN BERRY CONFERENCE

Grand Rapids, Michigan.

in association with the Great Lakes Fruit, Vegetable & Farm Market Expo

REGISTRATION FORM

You can register with this form, with the GL Expo form, or online at www.glexpo.com

Name(s) _____

Business/Organization _____

Mailing address _____

City _____

State/Province _____ Zip/Postal code _____ Country _____

Phone #1 _____ home work cell

Phone #2 _____ home work cell

E-mail _____

Website _____

TO ATTEND THE FULL BERRY CONFERENCE DEC. 4-6: REGISTER FOR BOTH OF THESE:

◆ **BERRY CONFERENCE REGISTRATION (DEC 4-5)**

Reception Sunday, Monday breakfast & lunch, and all Monday sessions and activities

	By 11/16	After 11/16	
NARBA or NASGA Member	\$75	\$90	\$ _____
Non-Member	\$125	\$145	\$ _____

◆ **GREAT LAKES EXPO REGISTRATION (DEC. 6-8)**

All Tuesday berry sessions, plus the trade show and all other tracks of educational sessions Tuesday-Thursday. There is no Tuesday-only option.

	By 11/16	After 11/16	
Registrant	\$80	\$95	\$ _____
Spouse	\$30	\$30	\$ _____

Use a separate form for unrelated individuals. Children under 18 are free. Names and ages: _____

WORKSHOPS

Getting Started in Raspberries and Blackberries (Tues am) # _____ \$ _____
 \$20 NARBA/NASGA member \$25 non-members

Create a Food Safety Plan for Your Farm (Tues pm) # _____ \$ _____
 \$15 NARBA/NASGA member \$20 non-members

MEMBERSHIPS

You may join/renew with your registration to take advantage of lower member registration rates. Memberships are per family/farm/location, not per person. If you joined in the last few months, you do NOT need to renew here.

NARBA DUES

NARBA Dues Amount \$ _____

Grower: \$50 new member \$85 renewal
 Plus Grower acreage charge of \$5/acre in caneberrries (maximum \$100)
 _____ acres x \$5 = \$ _____

- Research/extension/students** \$40
- Industry** (suppliers, processors, marketers, etc.) \$150

NASGA DUES

NASGA Dues Amount \$ _____

Business Membership (Grower, nursery, supplier)
 Renewing: \$175 for USA, Canada & Mexico \$190 for other countries
 New Member: \$85 for USA, Canada & Mexico \$95 for other countries

Individual Membership (Research, Extension, Student)
 \$55 for USA, Canada & Mexico \$65 for other countries

TOTAL DUE (Conference Registration plus Membership) \$ _____

SEND REGISTRATION TO GL Expo, 139 Eisenhower Place, Ann Arbor, MI 48108

Fax to: 734-677-2407

PRE-REGISTER BY 11/16/2016 TO SAVE \$\$\$ AND TIME

If you register by 11/16, your receipt, name badge and any special event tickets you order will be mailed to you. At the conference, just pick up your badge holder and program at the Pre-Registration Booth. If we receive your registration after 11/16/2016, you will need to pick them up onsite at the Registration Help Desk. Pre-registration fees will be refunded for any request made by 11/16/16. A \$10 processing fee will be charged for refunds.

PERMISSION TO USE PHOTOS: Please be aware that this registration form also serves as an agreement to appear in photographs taken at the 2016 Great Lakes Fruit, Vegetable & Farm Market EXPO and the Michigan Greenhouse Growers EXPO. These photos may be used for publicity or general information purposes and may be seen by the general public.

HOTEL: Do you plan to stay at one of these hotels during the EXPO? Amway Grand Plaza JW Marriott Courtyard by Marriott

CHECK ALL THAT APPLY:

- FRUIT GROWER** (also check crops grown)
 - Apples Cherries Peaches Pears Plums
 - Blueberries Grapes Strawberries
 - Raspberries/Blackberries Other Small Fruit
- VEGETABLE GROWER** (also check crops grown)
 - Asparagus Carrots Celery Cole Crops
 - Peppers Pickling Cucumbers Pumpkins
 - Squash Other Vine Crops Onions Potatoes
 - Snap Beans Sweet Corn Tomatoes
 - Other Veg Crops
- GREENHOUSE GROWER** **FARM MARKETER**
- ORGANIC GROWER**
- AG SUPPORT BUSINESS** **OTHER**

PAYMENT INFORMATION

Payment must accompany this form: Mail to: Great Lakes Expo, 1390 Eisenhower Place, Ann Arbor, MI 48108. Fax to: 734-677-2407.

Payment by Check: Check # _____
 Make check payable to: Great Lakes EXPO

Payment by Credit Card: Visa Mastercard
 Discover American Express

Card Number _____

CW Code _____ Exp. Date _____
 (3 or 4-digit number on back of card)

Print Name as it appears on credit card _____

Billing Street Address of Credit Card _____

Billing City/State/Zip _____

Cardholder Signature _____

New York Berry News (**NYBN**) is a seasonal commercial berry production newsletter provided by Cornell berry team members. It is designed to help promote and strengthen commercial berry crop production in New York State. NYBN is available free of charge in pdf format at: <http://www.fruit.cornell.edu/nybn/>.

Visit the NYBN web site to view back issues or to subscribe to monthly e-mail notices with table of contents and a link to the most current issue.

More on individual team members and their areas of expertise may be found at: <http://www.fruit.cornell.edu/berry/berryteam.htm>.

Horticulture Section
School of Integrative Plant
Science

Cornell University
Ithaca, NY

PHONE:
607-255-4568/1789

FAX: 607-255-0599

E-MAIL:
hort@cornell.edu

We're on the Web!
See us at:
<http://hort.cals.cornell.edu/>

Questions or comments about the New York Berry News?

Ms. Nicole Mattoon

NYS IPM Program – Geneva Campus

nem42@cornell.edu

