

Spring Berry "To Do" List

All Berries: Spotted Wing Drosophila (SWD) have been found in a sustained catch (meaning that we found them 2 weeks in a row on the same farm) in Albany, Rensselaer, Saratoga, Ulster and Washington counties. Insects were found in traps in Essex and Clinton counties this week. Given the number of counties throughout the state where the pest is being detected, the insect is very likely in all eastern NY counties. To check on current statewide distribution, click on the **2017 SWD Distribution Map**.

ALL Ripening berry crops and cherries are at risk! If SWD is in your area and susceptible fruit is coloring, including June strawberries, blueberries, summer raspberries and black raspberries, juneberries, honeyberries (haskaps), day neutral strawberries, etc., <u>insecticide treatments should begin</u>.

When weather patterns favor SWD population expansion – cloudy and high humidity – insecticides should be applied every 5-7 days. Choose the most effective insecticides with pre harvest intervals (PHI) that work for your picking schedule. Rotate insecticides according to their modes of action to prevent the development of insecticide resistance. Insecticide sprays will kill or suppress SWD adults, thereby reducing egg laying and slowing population buildup.

For the <u>current list of NY products for **berry crops**, click here</u>. There is a separate page for each berry crop, and the materials and specific details are different for each one, so please read carefully.

For the <u>current list of NY products for grapes and stone fruit, click here</u>.

Cultural controls for SWD

In addition to insecticides, there are cultural controls that should be taken to reduce the impact of SWD. Many of these things can be done now, including:

- Canopy reduction make sure to prune brambles and blueberries appropriately and strip lower leaves on brambles to reduce humidity.
- Weed the planting this helps reduce preferred SWD habitat and improves spray efficacy.

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 Although this year irrigation might be a moot point – examine irrigation equipment to make sure there are no leaks.

- Clean pick and don't leave dropped fruit whenever possible. Good sanitation will reduce egg laying opportunities.
- Regularly inspect fruit in the planting for symptoms and signs of SWD. For information on techniques, <u>click</u> <u>here</u>.
- Refrigerate berry fruit immediately after picking, and keep it cooled until purchased.

For a Michigan State perspective on how SWD has changed berry production practices, see the article in this newsletter.

Blueberries:

 Blueberry fruit set looks very strong throughout the region. Berries are sizing well and in a few cases a bit of color is actually showing.

Two weeks ago I spoke too soon about mummyberry. Seeing lots of mummies and small strikes now. Make a note to manage this disease early next spring if you are seeing strikes.



Strawberries:

June bearing strawberry picking is winding down in most areas except for some Herriot, AC Valley Sunset and Malwina. For the most part growers report an average or above average year. Leaf spot is still a concern on most farms. Renovation will help control this disease, but you should evaluate infection levels in early September. See the renovation article in this edition.

 A suggestion for strawberry growers who also grow brambles, blueberries or DN strawberries: after strawberry harvest renovate (or at least mow off the leaves) of fields as you finish picking. This will expose left-over fruit to sunlight and other elements that help break down what might otherwise be a source of SWD population buildup.

- Day Neutral strawberries are just beginning to ripen. If the nights' stay cool we could see a banner year.
- Stay on top of scouting DN's look for disease especially leaf spot, but also crown anthracnose. Tarnished plant bug, thrips, leafhoppers and mites are insect pests of these berries. SWD can also be a real problem – pick clean and refrigerate berries immediately.

Ribes:

- Currants and gooseberries are being harvested now.
- Scout for anthracnose and aphids on ribes plants.
- Tomato ringspot virus (ToRSV) was found in 'Pink Champagne' currants and also some blueberry plants this week. ToRSV is a plant pathogenic virus that affects species of cucumber, tobacco, tomato, blueberry, ribes and others. It causes ringspots in tobacco plants and raspberries, yellow bud mosaic in peaches, yellow vein in grapes, and stunted growth in some flowers. Its range is in the temperate regions of North America, especially where its vector, the dagger nematode, is present. Along with the adult and larval stages of this nematode, the virus is also spread by seed. This type of infection is more common in strawberries and soybeans than any other susceptible plant. See photo below.



Tomato ringspot virus in pink currant. This virus is vectored by dagger nematodes and cause challenges for many types of plants. It does not seem to impact yield in ribes, but it may in blueberries and other fruit crops.

Brambles:

- Floricane brambles have started harvest. Cane growth looks good and fruit set is strong.
- Orange rust on black raspberries has been reported in a few locations. This disease is a problem for black and purple raspberries but doesn't affect red raspberries. See the article on orange rust in this newsletter.

June Bearing Strawberry Renovation Tips

1. **Begin with weed control**. Use 2,4-D to control annual broadleaf weeds ideally right after harvest. If grasses are a problem, use Poast but don't tank mix the two herbicides. Read the label carefully as plant injury can occur with misapplication of 2,4-D.

2. **Mow strawberries** just above the crowns 3-5 days after herbicide application. Be careful not to damage crown by mowing too low.

3. Fertilize the planting. The main goal is to deliver nitrogen to help re-grow the canopy. Nitrogen should be applied at 25-60 lbs/acre, depending on vigor and basic soil fertility. Split applications (one now and the rest in 4-6 weeks) are better than a single fertilizer application. This gives plants more time to take up the nutrients in the fertilizer. A leaf tissue analysis (recommended once the canopy has regrown – see article this issue) is the best way to fine-tune your fertilizer program. This will tell you what the plants are actually able to take out of the soil and what nutrients are in sufficient supply or not.

4. **Subsoil**! This will be very important this year as constant saturated soil has become compacted where tractor and picker traffic has been heavy. Subsoiling between rows will help break up compacted layers and provide better water movement. Subsoiling may be done later in the sequence if necessary.

5. Narrow rows and cultivate between rows. Reduce the width of rows to 12-18 inches at the base. More berries are produced along row edges than in row middles. Wider rows lead to lower fruit production (yield and quality) and increased disease pressure. Narrow rows also give better sunlight penetration, air circulation, spray coverage, and over-all fruit quality. Use a rototiller, multivator, or cultivator to achieve the row narrowing. Work in the straw between the rows and try to throw 1-inch of soil on top of the rows at this time to stimulate new root formation on established crowns and new runners.

7. Post-renovation weed control. Pre-emergence weed control should begin immediately after the plants are mowed and the soil is tilled to narrow the crop row. Apply half the annual rate of terbacil (Sinbar at 4 oz/acre). You must mow strawberry plants first to prevent plant injury. If strawberry regrowth has started, you could really damage plants if you apply Sinbar. Sinbar should not be used on soils with less than 0.5% organic matter or on reportedly sensitive varieties such as Guardian, Darrow, Tribute, Tristar, and possibly Honeoye. Devrinol at 4 lb/acre or Dacthal at 8- 12 lb/acre can be applied at this time instead of Sinbar . Dacthal is preferred over Devrinol if the planting is weak. If Sinbar is used, apply Devrinol at 4 lb/acre 4 to 6 weeks later to control winter annuals. Be sure to water in the Devrinol.

During the summer, Poast can be used to control emerged grasses. Shallow cultivation is also common during the summer months. If you have a bad thistle problem you can use Stinger in September to help clean that up if renovation doesn't do the trick.

8. **Irrigate** to activate herbicides and for plant growth. The planting should receive 1 to 1-1/2 inches of water per week from either rain or irrigation.

9. Cultivate to sweep runners into the row until plant stand is sufficient. Runners not rooted by September will not bear fruit and should be considered weeds. Coulter wheels and/or cultivators will help remove these excess plants in the aisles.

10. Adequate moisture and fertility during August and September will increase fruit bud formation and improve fruit yield for the coming year. Continue irrigation through this period and fertilize if necessary. An additional 20 - 30 pounds of N per acre is suggested, depending on the vigor.

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Plan to Change when Dealing with Spotted Wing Drosophia Mark Longstroth, Michigan State University



In 2017, we are seeing an early start to spotted wing Drosophila (SWD) and there is a good crop of berries on host plants in the woods. To me, this means SWD will arrive earlier than normal and be a bigger problem than in recent years. I am concerned SWD will be an issue for fruit growers who have escaped SWD in the past because in previous years growers were harvesting earlier than the SWD surge. It looks like the surge will be early this year. Ripe fruit in the field is an incredible SWD magnet. Leaving ripe fruit in the field means SWD has many opportunities to attack that fruit and find any weakness in your spray program. Growers who fail to protect their fruit may be in for an unpleasant surprise.

Fruit growers have a hard job. They just want to harvest their crop with high quality, high yields and get it to market to be sold as quickly as possible. Having a pest at harvest makes this much more challenging, but growers are up to the task. In this new world of SWD, the management challenges really complicate harvest. To control SWD, you need to pay close attention to the ripeness of fruit in the field, protect that fruit, and watch the preharvest interval of the material used and your harvest schedule.



How SWD has changed growing fruit

SWD is a small, vinegar fly from Asia that has become a major fruit pest around the world. It first appeared in the United States in 2008. In 2009, it exploded up the West Coast attacking one of the major berry production areas and destroying millions of dollars of fruit. It appeared in Michigan in late 2010.

In 2011, SWD caused significant damage to Michigan blueberries. Growers who did not control this pest lost the crop from some of their most profitable fields. Since then SWD has become a major fruit pest in Michigan. It causes millions of dollars worth of damage to Michigan blueberries and cherries as well as peaches and plums. It has virtually destroyed the Michigan fall raspberry industry. Homeowners who grow berries know it well.

Even more importantly, SWD has increased the cost of growing an acre of fruit by hundreds of dollars. Many growers simply cannot afford to protect their fruit because the SWD has destroyed the profit margin.

I want to share my thoughts on what people need to do to control this pest. To me, it is not a fly; it is the spotted weapon of destruction. I think it has earned that nickname. Many of the habits and practices that have served fruit growers well for years do not work against SWD. Doing things the way you would have done them in the past will not work.

SWD is nothing like any insect pest you managed in the past.

SWD is different than most of the other insect pests that attack fruit. If you think of SWD as just another pest that can be controlled with a properly timed spray or two, you are doomed to fail. If you think of it as something that will destroy your fruit if you make a mistake, you have the proper mindset. If you think of SWD as a disease with "spores" that attacks your fruit from ripening through harvest, you will grasp the situation. SWD is always there.

The first thing to understand is SWD is not a pest of any particular fruit—it is a pest of all soft fruit. It overwinters as adults under the snow or in leaf litter protected from winter cold. The adults emerge in spring and begin to lay their eggs in the first fruit that ripen such as strawberries and other wild berries. It takes about a day or two for the eggs to hatch and two weeks for the maggots to mature and pupate into adults. In two weeks, 200 or 300 more SWD are looking for a place to lay their eggs.

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SWD is not particular and the fly moves to many different fruit as they ripen through the season. As long as there are ripe fruit in your fields or in the wild areas around your fields, there are probably SWD there to lay their eggs. This means the population builds continuously over the season.

Denial is a big part of the SWD problem. "It can't happen to me." "I don't have that pest." No one wants to talk about SWD. Growers do not want people to know they have a problem, marketers do not want people to know we have a pest that requires sprays and the public does not want worms in their fruit.

When MSU first established our trapping network, there were growers who wanted to keep the location of the traps a secret. My biggest fear was that a grower in Township A would assume there were no SWD in the area because they caught them in Township B, so they must not be in Township A.

Unless you are trapping for SWD on your farm and have not caught any flies, you have to assume you have them. Let me say that again. If you are not trapping for them, you have to assume SWD are there. If you have ripe fruit, you need to protect it.



SWD male on left, female on right. Photo courtesy of high-tunnnel.org.

Yes, you have to spray weekly and thoroughly

I am often asked, "How many days after I catch SWD should I spray?" My response is that if you caught SWD, they are laying eggs in your fruit. You should spray right now. This is not a pest where the capture of the first adult means the egglaying will begin several days later. This is not cherry fruit fly or blueberry maggot. Capturing an adult SWD means they are active and laying eggs.

Since SWD lays its eggs in the fruit, pesticide sprays target the adults. The goal is to kill the fly when it lands, before it lays its eggs. If you miss any SWD, their offspring will cause a lot of damage in a couple of weeks.

The fly does not sit out in the open where it would be easy to kill. SWD likes the shade, so it is inside the bush or the tree, or over in the cool, dark woods. SWD is active during the cooler parts of the day in the early morning and late afternoon.

In order to get good control, you need to cover the bush or tree. Penetrate sprays deep in the canopy and cover the backsides of the fruit. This requires changing the way you spray your fruit.

Growers do not like to spray. It takes a lot of time, pesticides are expensive, labor is expensive, the equipment is expensive and time is expensive. Many spraying tricks like speeding up, spraying multiple rows and reducing gallonages to make the work go faster and reduce the time to spray do not work with SWD. You need excellent coverage with contact materials that will kill the fly on contact. SWD does not spend a lot of time crawling around and systemic materials in the plant do not work against this pest.

Slow down, spray every row or two and double or triple your gallons per acre. I feel I cannot say this enough; all the tricks to reduce sprays to control insects and diseases work the wrong way when it comes to SWD.

You need excellent control, so you'll need to increase the gallons per acre and spray from both sides to get into the interior of the plant where the shade is. Think ahead to next winter too, and invest in pruning to open the bush canopy and help those sprays get into the deepest part of the bush where SWD likes to hide.

Michigan State University Extension's blanket recommendation for SWD control is to apply effective insecticides every week and reapply after a rain. Growers are used to materials that work for about two weeks; unfortunately, you'll need to reapply insecticides every week because there is not enough residue there to kill the SWD.

I have been telling blueberry growers for five years they need to spray once a week. Many tell me at first they did not believe me, but now they say *continued on next page*

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seven days is too long, it needs to be every five or six days. A week after making a mistake, your fruit will be soft and the buyer will reject it.

Plan to avoid pesticide resistance

With a tight insecticide schedule of weekly sprays and needing to reapply after any significant rain, pesticide costs quickly become an issue. Growers look to the cheapest material that will do the job, however, it will take a variety of materials to do the job.

Because SWD reproduce so quickly in such large numbers, there is a real risk of pesticide resistance if many growers use the same insecticide repeatedly because it is the cheapest material. Since there are several effective classes of insecticides, MSU recommends that no class of insecticide be used twice in a row and that growers rotate between chemical classes on every spray. Give careful thought and make a schedule for what you are going to use and when you are going to use it. What material will you use if it rains? Can you apply that material or do you need another material?

MSU has a website dedicated to Spotted Wing Drosophila (SWD) and its control in many crops. There are factsheets on SWD and specific recommendations for several important Michigan crops.

Crop recommendations for blueberries (in English and Spanish), cherries and raspberries are available as well as organic blueberry production. These crop recommendations include the insecticides MSU entomologists think will be the most effective with all the different restrictions. The insecticides are also listed by chemical class so growers can quickly see which materials are in the same class with the same mode of action.

Use this Salt Test Sampling Protocol to Check Fruit for SWD

1. Collect ripe fruit samples to be assessed via salt test. Sample size can be scaled up or down based on amount of fruit available, although the smaller the sample the lower the detection accuracy.

2. Place fruit sample in a 1 gallon ziplock bag. Set the bag on a hard surface and lightly crush each of the berries. For blueberries this means pushing on them just till the skin breaks, for raspberries this means just depressing the berry a bit. Do not mash the berries as this adds too much pulp to the liquid which makes the larval assessment much more difficult later.

3. Add salt water solution (1 cup of salt in 1 gallon of tap water) to the bag so are berries are covered with salt water. Seal the bag, removing as much air as possible from the bag. Removing the air from the bag minimizes the chances of larvae crawling out of the salt water and towards the top of the bag.

4. Let the bag sit for 1 hour before assessing for larvae.

5. Place bag on dark surface or pour into shallow, dark colored pan to improve visibility of white larvae.



All size larvae visible. This photo was from OMAFRA, Canada. These fruit were infested in the lab for demonstration purposes, so they are plentiful.

Flower Thrips in Strawberries Hannah Burrack and Aurora Teonnisson, NC State University

Biology

Flower thrips (*Frankliniella spp*.) are tiny insects that feed on strawberry leaves, flowers, pollen and fruit. In addition to strawberries, they feed on a variety of other cultivated plants and weeds. Some flower thrips feed on twospotted spider mite eggs so low levels of flower thrips can be beneficial. To the naked eye, flower thrips look like elongated yellow or brown specks, about a millimeter long, that run rapidly when disturbed.

Examination with a hand lens or microscope reveals the adult flower thrips to have two pairs of feathery wings. Adult female thrips lay their eggs into the leaf of a host plant. The tiny (< 1mm) yellow or white larvae hatch 2-14 days later. Availability of pollen and warm temperatures greatly facilitate larval development which can be completed in as little as 3-5 days. Once mature, larvae spend a pre-pupal and pupal stage in the soil before returning to the plant to feed and reproduce as adults. Western flower thrips (*Frankliniella occidentalis*), one of the species that may be found in strawberries.

Damage in strawberry

Flower thrips' tiny mouthparts pierce and suck plant juices from the outer layer of plant tissue. This feeding does not seriously damage strawberry leaves, but thrips feeding can cause misshapen blossoms and bronzing of the fruit near the leaf cap. Such feeding damage is rare in North Carolina, and when it does occur, usually happens late in the season.

Thrips feeding has not been shown to impact fruit set, and thrips feeding does not cause deformed fruit.

Sampling and thresholds

Strawberry blossoms can be held over a piece of white paper and beat against it so that thrips fall onto the paper. Note that even adult thrips are very small, so a handlens may be useful for distinguishing them from other arthropods. Treatment thresholds for North Carolina have not been established, but work in California indicates the insecticide treatment should be considered only after populations exceed 10 thrips per blossom.

Management options

Conventional foliar insecticides are available for control of flower thrips. Refer to the North Carolina Agricultural Chemicals Manual for materials recommended for use in North Carolina and the Southern Region Small Fruit Consortium Strawberry IPM Guide for regional recommendations.

OMRI approved foliar materials are available for control of flower thrips. Refer to the North Carolina Agricultural Chemicals Manual for materials recommended in North Carolina and the Southern Region Small Fruit Consortium

Biological Control

Minute pirate bugs, such as the insidious flower bug (*Orius insidiosus*), feed readily on flower thrips. These insects occur naturally in North Carolina, and purchasing additional bugs for release is unlikely to be cost effective. Some predatory mites are available for release against thrips (*Amblyseius swirskii*), but these mites have not been widely tested in strawberries.

Source: NC State Strawberry Factsheet Series, May 2014



P.M.J. Ramakers, Applied Plant Research, Bugwood.org



Bronzing and cracking of fruit surface from Thrips feeding. (photo courtesy of OMAFRA)

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Calendar of Events

Ag Business Tuesdays this Summer – free farm business technical assistance.

The Cornell Cooperative Extension Eastern NY Commercial Hort Team, in collaboration with CCE County offices, is offering free farm business technical assistance appointments this summer on Tuesdays at various locations in our service region. Topics for consultations can include: labor regulations and management, risk management (insurance and best practices), land use regulations and zoning, other food-regulations (labels, processing), personal finance and farm transition planning, tax and other grant and incentive programs, bookkeeping and recordkeeping, pricing products and market channel assessment, contract terms and negotiation, and loan programs and financing decisions. At your appointment we can either help to answer your questions or help direct you to the right resources.

Planned locations for July 2017

ERRY NEWS

- July 11 CCE Clinton County, Plattsburg NY
- July 25 CCE Warren County, Warrensburg NY

Appointments are in 1.5-hour increments starting at 9:00 am. In some cases, early morning or early evening appointments may be available. Pre-registration in advance is required - we cannot accommodate walk-ins. If you can't physically come to the office, we can also schedule an appointment by phone or a video conference.

To register go to: http://bit.ly/2oyaGpM or call (518) 949-3722 and leave your name, preferred date and preferred time and the best way to reach you. Liz will also be doing farm visits in the counties on the following Wednesday. If you would like a farm visit, contact her directly at emh56@cornell.edu.

July 11, 5-7 pm - VVBGA On-Farm Workshop - Strawberry Pro-

duction at Four Corners Farm, 306 Doe Hill Road Newbury VT

The Gray family grows about 50 acres of fresh produce including 10 acres of strawberries. They use innovative plasticulture techniques, grow their own straw mulch, rotate with cover crops for soil health, and have tried many varieties and production systems over the years. Currently they have 11 different varieties in production. This workshop is free.

July 18, 5-7pm – Mid-Season Berry Workshop – location TBA, but it will be in the general Montgomery county area. We'll discuss strawberry renovation, day neutral pest control and fertility, foliar nutrition sampling etc. Bring your questions! This workshop is free.

August 29th, 5-7 pm – Using weather and climate information and protected culture to improve berry crop production, The Berry Patch, 15589 NY-22, Stephentown, NY 12168.

Join NEWA and MESONET specialists to learn first-hand how berry crop production can be enhanced with weather apps and localized information. Look at exclusion netting and insecticidal lures used in research. Observe non-chemical weed control options for day neutral production.

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