



UMass
Extension
CENTER FOR AGRICULTURE

Berry Notes

Prepared by the University of Massachusetts Fruit Team

August 2015 Vol. 27, No. 8

www.umass.edu/fruitadvisor/berrynotes/index.html

Massachusetts Berry Notes Underwriters:



Berry Notes is edited by Sonia Schloemann with articles written by other contributors with attribution; sources are cited. Publication is funded in part by the UMass Extension Agriculture & Landscape Program, subscription fees and generous underwriting. Questions can be directed to Sonia Schloemann at 413-545-4347, sgs@umext.umass.edu. Please cite this source if reprinting information that originates here.

IN THIS ISSUE:

CROP CONDITIONS

ENVIRONMENTAL DATA

STRAWBERRY

- ❖ Late Season Strawberry Care – Including Foliar Disease Management
- ❖ Strawberry Fruit Bud Development

RASPBERRIES/BLACKBERRIES

- ❖ Orange Rust of Blackberry and Black Raspberry
- ❖ Late Leaf Rust of Raspberry

BLUEBERRIES

- ❖ Putnam Scale in Blueberries
- ❖ Powdery Mildew on Blueberries – Not Symptoms You'd Expect

GRAPES

- ❖ Don't Let Bunch Rots Ruin Your Grapes
- ❖ Grape Anthracnose

GENERAL INFORMATION

- ❖ Do My Fruit Have SWD?
- ❖ Late Summer Weed Control Options for Berries

UPCOMING MEETINGS

CROP CONDITIONS:

Strawberry fields remain quiet at this time of year. Dayneutral varieties are still fruiting. Some annual production fields are being planted now. Late summer and early fall is a good time to fertilize both new and established strawberry fields. Typically strawberries will need 20 – 50 pounds of nitrogen at this time of year. Amounts depend on how much was applied at renovation and the organic matter content of the soil. Evaluate established fields for the foliar diseases or other problems that could carry over to next year. Also scout fields for weed problems that can be addressed in the fall. **Highbush Blueberry** harvest is about done. A few late varieties may still be active. Late season varieties showed increased SWD infestation levels where rigorous management was not employed. Survey fields before fall dormancy for weak bushes and determine whether or not Blueberry Stunt or Scorch virus may be the cause. Contact the [UMass Extension Plant Diagnostic Lab](#) for help with virus testing. Only non-nitrogen fertilizer applications should be made this late in the season if leaf tissue tests indicate deficiency. Also, be sure to keep your blueberries watered during the coming weeks to avoid drought stress as they go into dormancy. Scout fields for weeds to prepare for late season management strategies. **Summer raspberry** harvest is complete and spent floricanes can be removed now to allow for good light penetration to primocanes. This can increase flower bud formation along the length of the canes. Be on the lookout for Orange Rust on black raspberries and blackberries. **Fall raspberries** are in full production and SWD management is the most important activity at this time. SWD populations are increasing rapidly in this hot humid weather. Be sure to rotate materials and make sure to adhere to label restrictions when only a limited number of applications is allowed. Botrytis fruit rot is still a threat, especially if wet weather returns. Be sure to provide irrigation (drip preferred) so the canes can size up the fruit. Also check for mites and leafhopper damage. **Grapes** are approaching harvest. Scouting for disease and insect levels and taking corrective action are still important activities now. Prepare for wine grape harvest by checking fruit ripening parameters regularly. Mite infestations can build up quickly at this time of year. Be sure to check the underside of your leaves.

ENVIRONMENTAL DATA

The following growing-degree-day (GDD) and precipitation data was collected for an approximately two week period, August 7 through August 19. Soil temperature and phenological indicators were observed on or about August 19. Total accumulated GDDs represent the heating units above a 50° F baseline temperature collected via our instruments for the 2015 calendar year. This information is intended for use as a guide for monitoring the developmental stages of pests in your location and planning management strategies accordingly.

| Region/Location | GDD (2-Week Gain) | GDD (Total 2015 Accumulation) | GDD (Total 2014 Accumulation) | Soil Temp (°F at 4" depth) | Precipitation (1-Week Gain in inches) |
|-----------------|----------------------|-------------------------------------|-------------------------------------|-------------------------------|---|
| Cape Cod | 687 | 1,890 | 1,761 | 80 | 2.37 |
| Southeast | 441 | 1,721 | 1,701 | 86 | 1.25 |
| North Shore | 606 | 1,840 | 1,876 | 76 | 0.79 |
| East | 666 | 2,060 | 1,946 | 77 | 1.22 |
| Metro West | 582 | 1,869 | 1,724 | 82 | 0.54 |
| Central | 265 | 1,587 | 1,643 | 70 | 1.56 |
| Pioneer Valley | 656 | 2,124 | 1,959 | 77 | 1.47 |
| Berkshires | 508 | 1,676 | 1,500 | 72 | 1.67 |
| AVERAGE | 551 | 1,846 | 1,764 | 78 | 1.36 |

n/a = information not available

(Source: UMass Landscape Message #19, Aug. 21, 2015; 2014 same date GDD provided for comparison)

STRAWBERRY

Late Season Strawberry Care – Including Foliar Disease Management

Kathy Demchack, Penn State Univ.

This is the time of year when your strawberry plants are initiating flower buds for next year's crop. So, anything you can do take care of your plants now will help to increase next year's yields. Failure to take care of them now could set the stage for poor yields next year. So, what do we need to do? 1) Make sure the plants have adequate water (1-2" per week). 2) Make sure the plants have sufficient nitrogen (20 to 30 pounds applied during the mid-August to mid-September time frame, or slightly more on sandy soils). If you've experienced a lot of rain since renovation, you may want to apply the nitrogen a bit earlier than usual, especially if plants are light green and are not growing as fast as usual. Nitrogen you applied at renovation may have been washed through the soil, especially if it was in a nitrate form. 3) Keep an eye out for foliar diseases (as you've probably noticed, there are a lot of them out there this year), and apply an effective fungicide for any fungal diseases. Injured leaves = less photosynthesis = less food for flower buds and healthy root growth, and a lot of inoculum overwintering can damage your plants, including fruit, next year. The trick is correctly identifying which leaf disease(s) you have, and knowing whether any the symptoms you are seeing are caused by fungus or a bacteria. Fungicides only work on diseases caused by fungi. So... here's a description of leaf diseases I'm seeing most frequently this year, in order from most common to least common, at least for 2009.

Leaf scorch: Spots on leaves start out circular and dark red to purple. Eventually the center may turn brown, spots may coalesce, and entire leaves and become affected and die, given the whole plant a scorched appearance. Some common fungicides are effective against this disease, which can be easily confused with angular leaf spot, on which fungicides will have no effect.



Leaf scorch (left) and angular leaf spot (right) when viewed with light shining down on the leaves.

Angular leaf spot: At first, light green “windowpanes” between the veins show up on the leaf when it is held up to the light. From the top, these areas may have a blackened appearance at first. Later on, as affected areas enlarge and coalesce, the leaves may develop a reddish tinge, with leaf tissue eventually dying and turning brown. This disease (along with gray mold) was responsible for a lot of caps on the fruit turning brown or black this past spring. Fungicides don’t affect this disease, but copper can help (see cautions below). Since leaf scorch and angular leaf spot are easily confused, here are some photos to help tell the difference. These photos are of the same two leaves, held differently so sunlight either shines down on them, or through them. The primary disease affecting the leaf on the left is leaf scorch, and the one on the right, angular leaf spot. In the first one, where sunlight is shining down on the leaves, the leaves appear very similar. In the second photo, where leaves are held up so that sunlight shines through the leaf, you can see that light does not shine through the leaves with leaf scorch on the left, but the “windowpane” effect of angular leaf spot can be clearly seen in the leaf on the right. Note that in these two leaves, there is some of each disease present on each leaf, but the disease causing most of the spots is different.



Leaf scorch (left) and angular leaf spot (right) when held up to the light. The same two leaves appear in each photo.

Powdery mildew: Usually the first symptom noticed is leaf curling, where leaves fold inward along their length. There may be a purple tinge to the leaves. White powdery growth on the upper leaf surface may or may not be seen, but if you look at the leaves under magnification, as with a 16x hand lens, you may be able to see the growth of

fungal mycelia on either leaf surface. On the leaf undersides, be careful not to confuse strawberry leaf hairs (they’re straighter and thicker) with the mycelia.

Phomopsis leaf blight: As lesions grow, they form a Vshape, with the wide portion of the “V” at the leaf’s edge.

Common leaf spot: I’m seeing less of this all the time - most of today’s common strawberry varieties have resistance. Spots are small (1/8 to 1/4 inch across), and develop white to gray centers, which may fall out.

Once you’ve figured out which disease(s) you have, how do you treat them? First, any cultural controls that improve air circulation will help greatly. Keep rows narrowed, and keep plantings weeded. As a general rule of thumb, Nova and Pristine work well on any of the above diseases except for angular leaf spot – just be sure to tank-mix or alternate chemistries, such as with Captan, as both are susceptible to resistance development. Captan or Captivate work quite well on leaf scorch, common leaf spot, and phomopsis leaf blight, but

not powdery mildew or angular leaf spot. Copper helps with angular leaf spot, but phytotoxicity is a concern, so follow precautions on the package and discontinue use if phytotoxicity appears. For more info on these diseases and their biology, efficacy ratings, and management options, see the most recent version of the Mid-Atlantic Berry Guide [or 2015 New England Small Fruit Pest Management Guide]. (**Source:** *Pennsylvania Fruit Times Vol. 28, No. 7*)

Strawberry Fruit Bud Development

Bruce Bordelon, Purdue University

June bearing strawberries are “short day” plants that set flower buds in response to short days. As we get into late summer, days shorten and strawberry plants respond by setting the flower buds that will result in the crop next spring. It is important to maintain appropriate nutrition and soil water status during this time. General recommendations are to fertilize strawberry fields with 20 to 50 pounds of actual nitrogen per acre. Nitrogen rates

depend upon amount supplied at renovation and plant vigor. New fields with high vigor may not need additional nitrogen now, but older fields should benefit. Irrigation during this time is also extremely important, if rainfall has not been sufficient in your area. We suggest about 1 inch per week. Continue to irrigate strawberries through fall to assure a good crop next year. (**Source:** *Facts for Fancy Fruit, Vol. 15, Issue 9, August 14, 2015*)

RASPBERRIES/BLACKBERRIES

Orange Rust of Blackberry and Black Raspberry

James Travis, Penn State Univ.

Orange rust is a fungal disease that occurs only on brambles, particularly blackberries, dewberries, and black raspberries. This disease is not known to affect red or purple raspberries. This is a systemic disease. Once the plant is infected, the entire plant is infected for life.

Symptoms: The diagnostic symptoms of orange rust occur early in the spring when the new shoots begin their growth. The new leaves are stunted, deformed, and pale green or yellowish. Waxy blisters cover the undersides of the leaves. These blisters later become bright orange and powdery, the characteristic that gives the disease its name "orange rust." Canes produced on the diseased plants may appear healthy. However, these infected canes are usually spineless and do not produce blossoms. The diagnostic orange pustules will be produced on the leaves of these canes the following spring. Infected plants generally take on a bushy appearance since many short, upright shoots arise from one bud.

Disease Cycle: Orange rust is caused by two fungi: *Arthuriomyces peckianus* and *Gymnoconia nitens*. The disease occurs only on black raspberries, blackberries, dewberries, and possibly purple raspberries. The two fungi that cause the disease are very similar. The disease is not known to affect red raspberries. The fungus is systemic and overwinters in diseased roots and canes. Orange rust generally is favored by cool wet conditions. When the orange spore pustules mature and break open in June or July, the spores are spread to other plants by the

wind. The fungus enters the plant through the leaves and grows internally through the canes, crowns, and roots. Newly infected plants seldom show symptoms until the following spring.

Disease Management: Many initial problems in the bramble planting can be prevented by starting with certified, disease-free nursery stock. Inspect all plants in the spring for symptoms of infection. As soon as symptoms of orange rust are detected, remove the entire plant. Remove and destroy all wild blackberries and raspberries in the area that might serve as a source of disease. Any practice that speeds the drying of foliage, such as keeping plantings weeded and rows narrowed back, will assist in control since spores need a relatively long period of leaf wetness in

order to be able to germinate and penetrate the leaves in the spring. Avoid tipping canes in the fall because transporting inoculum on hands is easy during this operation. No chemical control is known for this disease. Some blackberries, specifically Ebony King, Eldorado, and Raven, are reported to exhibit resistance. If fungicides are used, they should be applied from the time orange pustules are first seen until the leaves on which they were produced die and dry up, and then again during late summer or fall when temperatures cool. Refer to [Table 7.5](#) [or the 2015 New England Small Fruit Management Guide] for pesticide recommendations. (**Source:** *Penn State Small Scale Fruit Production Guide*)



Photo credit: Cornell Diagnostic Imaging Page <http://www.fruit.cornell.edu/tfabp/gallery.htm>.

Late Leaf Rust of Raspberry

James Travis, Penn State Univ.



Late Leaf Rust on underside of raspberry leaf. Photo credit: Cornell Berry Diagnostic Tool.

Late leaf rust can be a problem on fall-bearing raspberries. The disease infects red and purple raspberries but not black raspberries or blackberries. This rust, unlike orange rust, is not systemic.

Symptoms: Yellow masses of spores are noticed primarily on fall fruit of primocane-bearing varieties, making the fruit unmarketable. Because symptoms on the fruit do not usually develop until late in the season, infections in plantings of summer-bearing varieties may go unnoticed. Powdery yellow spores also form on the undersides of leaves, causing badly infected leaves to drop prematurely, but this symptom is generally not noticed until infected fruit is seen.

Disease Cycle: There are several species of late leaf rust fungi worldwide. In our region, *Pucciniastrum*

americanum is believed to be the causal agent. White spruce and Engelmann spruce serve as alternate hosts, and their closeness to a planting may increase the likelihood of occurrence. Spores are produced on infected spruce needles in early summer and can infect raspberries. High humidity is necessary for infection to take place. The raspberries will show symptoms shortly afterward. However, spruce are thought not to be necessary for the rust to survive in a planting once infected since this disease has occurred in successive years in plantings with no spruce in the vicinity. Spores are disseminated by wind but may also be physically moved from infected to uninfected plantings by people or machinery.

Disease Management: Clean nursery stock is important since planting stock can be the initial source of inoculum. Control is aided by cultural practices that increase air circulation within the planting such as thinning canes, keeping rows narrow, and practicing good weed control. Prune fall bearers to the ground; do not keep canes around for a summer crop and rake and dispose of all old leaves. Removing floricanes and infected primocanes in winter

will reduce the amount of inoculum. This disease has been especially problematic on summer-bearing Festival and fall-bearing Heritage and Jaelyn. Fall-bearing Josephine and spring-bearing Nova and Esta



Late Leaf Rust on raspberry fruit.

Photo credit: Cornell Berry Diagnostic Tool.

red raspberries tend to be resistant. Because this fungus is not systemic, eliminating the disease from plants is possible. Refer to [Table 7.5](#) [or the 2015 New England Small Fruit Management Guide] for pesticide recommendations. (**Source:** *Penn State Small Scale Fruit Production Guide*)

BLUEBERRY

Putnam Scale in Blueberries

Cesar Rodrigues-Saona, Rutgers University

Crawlers are now present on trap tapes that were placed on infested bushes. This is the start of Putnam scale emergence. If using Esteem, then treatments can be applied now. If using Diazinon, then wait until next week. Not matter what the insecticide is, use enough volume.

Life history: Scales feed on plant sap, decreasing plant vigor and fruit yield. Adult scales are protected from insecticide sprays by a waxy covering. These insects are common in older canes when not removed, and located mostly under loose bark. In New Jersey, the Putnam scale has two generations a year. It overwinters as second-instar nymphs under loose bark. Spring activity begins in early February. Eggs from the first generation are laid in late

April, and immature “crawlers” begin to appear in mid-May. Peak crawler emergences occur in late May and early June. Peak crawler emergences for the second generation occur in early to mid-August (this time of year).



Monitoring and Management: Growers that have a scale problem need to treat post harvest for the 2nd generation of crawlers (use Diazinon or Esteem). Crawlers can be monitored by wrapping black electricians’ tape covered by double sided sticky tape around canes. Use a hand lens to see crawlers on the sticky tape. Sprays should coincide with crawler emergence. (**Source:**

Blueberry Bulletin, Volume 30, No. 15, August 18, 2014)

Powdery Mildew on Blueberries – Not Symptoms You’d Expect

Kathy Demchak and Cassandra Swett, Penn State Univ.

Powdery mildew, a warm-weather high-humidity disease, is present in some blueberry plantings. Lowbush, highbush, and rabbiteye blueberries are all affected.

Symptoms on blueberries are different from those on most other plants, and could be mistaken for a virus or bacterial disease. The powdery mildew organism, *Microsphaera vacinii*, at first causes a yellow mottling on the upper leaf



Photo 1: Early powdery mildew symptoms on upper surface of blueberry leaf. Credit: Tracey Olson, PA Dept. of Agriculture



Photo 2: Powdery mildew symptoms on lower surface of blueberry leaf. Credit: Tracey Olson, PA Dept. of Agriculture

surfaces (Photo 1), but eventually the mottled areas develop into red spots with a lighter margin; both of these symptoms could be mistaken for a virus. Symptoms on the lower leaf surfaces consist of water-soaked areas (Photo 2) that turn reddish; these symptoms might make one think that the plants have a bacterial disease. The typical “powdery” patches as seen on

other crops may be present, but often are not.

Since disease development is favored by warm, dry weather, symptoms start to appear in mid-summer. The fungus overwinters in dormant buds, so inoculum can build up over time if not managed. In most cases, this disease has minor impacts on growth and fruit production, primarily causing infected leaves fall off prematurely. In rare cases impacts on growth can be severe.

Generally powdery mildew incidence on blueberries is not sufficiently severe to warrant a fungicide spray. However, if leaves are severely affected, fungicides such as Orbit, Tilt or Quash (all in activity group 3), or Pristine (activity groups 7 and 11) may be used. Be sure to follow label directions to avoid development of resistant fungal strains. Cultivars vary in resistance, but information on this subject is limited.

Thanks to Tracey Olson at the [PA Dept. of Agriculture](#) for bringing the presence of this disease to our attention and for providing photos for this article. (Source: *PA Fruit Times*, August 28, 2015)

GRAPE

Don't Let Bunch Rots Ruin Your Grapes

Annemiek Schilder, Michigan State University

This 2014 growing season, Botrytis bunch rot may be a bigger menace than usual due to prevailing moisture and high humidity. Botrytis bunch rot is caused by the fungus *Botrytis cinerea* and is the most common cause of pre-harvest losses of wine grapes. Another problem may be sour rot, caused by acetic acid bacteria, yeasts and certain fungi. Sour rot can explode after heavy rainfall during fruit ripening, resulting in swelling and bursting of berries, especially near woods. Fruit flies get in on the melee and help spread the microbes on their bodies. Botrytis and sour rot can be present in the same cluster, in addition to Phomopsis and black rot, so it is important to distinguish the culprits. Bunch rot often begins in one or a few berries, and can consume most of the cluster under the right conditions. Sometimes when rot is prevalent or developing faster than expected, the harvest date has to be moved up to avoid excessive losses.

If humid conditions persist, Botrytis pressure may be high this year. Remove leaves from around grape clusters and protect clusters with effective fungicides.

There are various fungicides available for control of Botrytis bunch rot while very few aid in sour rot control. Sour rot is best controlled by leaf pulling around the clusters between bunch closure and veraison to reduce humidity and increase sun exposure. While biocontrol agents like Serenade (*Bacillus subtilis*), Actinovate (*Streptomyces lydicus*) and Blightban (*Pseudomonas fluorescens*) may help by competing with sour rot microbes, leaf pulling is the main control method.



Mid-symptoms of Botrytis bunch rot in grapes.

Growers in Ontario apply potassium metabisulfite to “dry out” the clusters and kill yeasts and bacteria.

For Botrytis treatments, [Michigan State University Extension](#) advises growers to make sure to alternate fungicides in different chemical classes to avoid fungicide resistance development. The Fungicide Resistance Action Committee (FRAC) code indicates the mode of action; any fungicides with the same

FRAC number share the same mode of action. A conventional standard that has been quite effective in our fungicide efficacy trials is a Pristine/Vanguard alternation: bloom (Pristine), bunch closure (Vanguard), veraison (Pristine) and two weeks before harvest (Vanguard). Adding another chemical class (e.g., Elevate) would be even better from a fungicide resistance management perspective. Biological control agents and reduced-risk products also can be used, particularly during lower risk periods (e.g., bunch closure) or when approaching harvest to avoid fungicide residues.



Late symptoms of Botrytis bunch rot in grapes.

Below is a list of products with efficacy against Botrytis bunch rot.

Elevate: fenhexamid, FRAC group 17, locally systemic; zero-day pre-harvest interval (PHI). Good to excellent preventive and limited post-infection activity.

Endura: boscalid, FRAC group 7, systemic, 14-day PHI. Good to excellent preventive and post-infection activity. Use at an 8-ounce rate for Botrytis control.

Flint: trifloxystrobin, FRAC group 11, locally systemic, 14-day PHI. Moderately good preventive and limited post-infection activity. Works better at higher rate.

Inspire Super: difenoconazole + cyprodinil, FRAC groups 3 and 9, systemic, 14-day PHI. It is mainly the

cyprodinil component that provides Botrytis control. Good to excellent preventive and post-infection activity.

Luna Experience: fluopyram + tebuconazole, FRAC groups 7 and 3, systemic, 14-day PHI, 10-day REI for leaf pulling, trying and training in wine grapes. Good to excellent preventive and post-infection activity.

Pristine: pyraclostrobin + boscalid, FRAC groups 11 and 7, systemic, 14-day PHI. Good preventive and post-infection activity, but only at the high rate of 18.5-23 ounces per acre.

Rovral: iprodione, chemical group, FRAC group 2, locally systemic, seven-day PHI. Moderate to good preventive and limited post-infection activity; activity is improved by addition of oil or non-ionic spray adjuvant.

Scala: pyrimethanil, FRAC group 9, systemic, seven-day PHI. Good to excellent preventive and post-infection activity.

Switch: cyprodinil and fludioxonil, FRAC groups 9 and 12, systemic, 14-day PHI. Provides good Botrytis control. Preventive and post-infection activity.

Topsin M: thiophanate methyl, FRAC group 1, systemic, 14-day PHI. Good preventive and post-infection activity.

Vanguard: cyprodinil, FRAC groups 9, systemic, seven-day PHI. Good to excellent preventive and post-infection activity.

Reduced risk and biocontrol agents:

Botector (*Aureobasidium pullulans*): biocontrol agent, locally systemic, zero-day PHI. Good to excellent preventive and limited post-infection activity.

Regalia: giant knotweed extract, FRAC group NC, induced resistance, zero-day PHI. Good to excellent preventive and limited post-infection activity.

Serenade (*Bacillus subtilis*): biocontrol agent, protectant, zero-day PHI. Fair to moderate protectant activity. Organic formulation can be used in organic vineyards. (*Source: MSU Fruit Crop Advisory, August 6, 2013*)

Grape Anthracnose

Bruce Bordelon, Purdue University

With all the rain we've had in 2015 it is not surprising to see more disease problems than normal. One disease that is widespread this year is grape anthracnose, aka black spot or Bird's eye rot. There have been numerous reports from both commercial vineyards and home

grape plantings. This disease is not uncommon, but is seldom widespread except in very wet years. All the rain we've had this year is making the disease worse than normal. In addition, the newer cold hardy grape cultivars from Minnesota appear to be highly

susceptible to anthracnose. There are now several acres of Frontenac, Marquette and La Crescent planted in the state.



Fig. 4 Grape anthracnose

Anthracnose can infect all green grape tissues, (Fig. 4). Symptoms first appear early in the year on the first few internodes of new shoots. They are deep lesions with dark margins and a gray center. If the disease spreads to young tissue, it can distort and kill the shoot tips, giving the shoots a burned appearance. Leaf lesions often cause the leaf to distort and curl. Centers of the spots often fall out, leaving a shot-hole appearance. fig grape anthracnose The disease spreads to developing berries. Berry lesions appear as a dark spot with a gray center, giving the disease its common name, Bird's eye rot. Bird's eye rot is mostly cosmetic, as it does not affect the eating or processing quality of the fruit, (Fig 5). Severe infection, however, can reduce vine vigor and yield.



Fig. 5 Birdseye rot

Managing anthracnose can be relatively easy. The best control method is to apply a delayed-dormant application of liquid lime sulfur or Sulfurix (calcium polysulfide). This fungicide effectively kills the developing spores (primary inoculum) at the beginning of the season and prevents the disease from becoming established. If this spray is missed and the disease becomes established, control is more difficult. Lime sulfur will burn tender foliage so it must be applied just as buds are swelling, but before the leaves are exposed. After bud break mancozeb, captan and the strobilurin fungicides such as Abound or Sovran can provide some control and keep the disease from spreading. But the single application of lime sulfur usually provides nearly complete control. That's why it's important for growers with a significant problem this season to plan ahead for an early season fungicide application next year. (*Source: Facts for Fancy Fruit, Vol. 15, Issue 9, August 14, 2015*)

GENERAL INFORMATION

Do My Fruit Have SWD?

Juliette Carroll, Cornell University

Suggested ways for checking fruit for SWD infestation, include looking for egg breathing tubes, finding leaking pinholes, and floating out the larvae.

Egg breathing tubes You'll need a good pair of eyes and 20x magnification. Fruit on which this technique works fairly well include blackberry, cherry, black raspberry, dark plum and grape varieties, and probably nectarines. Looking for breathing tubes on fruit that is fuzzy (peach, red raspberry), has a waxy bloom (plums, grapes), or is light yellow in color may not be worth the effort. Blogs with **breathing tube pictures**: [SWD in](#)

[plums](#), [Monroe County – first report](#), and [Oviposition in blackberry](#). **A word of caution** – I've noticed that once the egg has hatched (12 to 72 hours after laying) the breathing tubes may be shed from the fruit and, therefore, won't be visible. After hatch, what remains on plum, blueberry and other relatively thick-skinned fruit is a pinhole through which the larva periodically breathes as it pauses from feeding. The soft skin and drupelets of blackberry and raspberry collapse in response to larval

feeding and the pinhole is less apparent.



Figure 1. Spotted wing drosophila oviposition in a grape (photo taken in 2012); note the tiny, white filaments visible on the fruit surface (red circles) which are the egg's breathing tubes (magnified in the inset). **Credit:** Faruque Zaman

Leaking pinholes On tougher skinned fruit (plum, blueberry, cherry, grape) gently squeezing the near-ripe to ripe fruit may cause a dewdrop of juice to leak through the pinholes that are associated with oviposition and larval development. Fruit that appears sound but from which leaking juices are noticed can be a sign that SWD may be developing in the fruit. Dried drops of juice seen

on leaves below a fruit cluster or on fruit in the field are also signs of possible SWD infestation, especially if no bird damage, cracking or other obvious signs of damage are seen on the fruit.

Floating out the larvae The salt floatation method can be used to quickly assess larval infestation in fruit. This method works better with the soft-skinned fruit, such as blackberry and raspberry. It can be used on blueberry, though the skins may trap the larvae and possibly affect the test results. On larger fruit, such as cherry, peach, and plum, this technique may not work very well. Dissolve 1 Tbsp (~15 cc) table salt in 1 cup (~250 ml) water. Place about 100 fruit in a Ziploc bag or a crisper-type container and add the salt solution. Gently crushing the fruit may help release the larvae. After one hour, examine the salt-solution-immersed fruit for the presence of [larvae \(white, ~2-4 mm long\)](#). The fruit sample may be split into two parts. One part used immediately in a salt floatation test. The other part kept for 3 days to allow eggs to hatch and larvae to develop prior to doing the salt floatation test. (Keep the fruit covered during the 3-day incubation, so it is not contaminated by ambient vinegar flies, and keep it on paper towels or a sponge to absorb liquid, so the larvae don't drown.) (**Source:** *Cornell University SWD Blog entry Sept. 6, 2013*)

Late Summer Weed Control Options for Berries

Laura McDermott, Cornell Coop Extension Capitol District

Strawberry Weed Control: Controlling fall germinating winter annuals such as chickweed and shepherds purse is critical at this time of year.

Devrinol (napropamide) is a pre-emergent herbicide that can cause problems with rooting of daughter plants so this material should be used after early forming daughter plants have rooted. Because daughter plants that form after late August don't usually contribute as much to the yield, *Devrinol* can be applied without much effect at that time, but BEFORE winter annuals emerge. *Devrinol* must be moved into the soil by cultivation or water after application.

Sinbar (terbacil) is a preemergent herbicide with some postemergence activity. Usually *Sinbar* is applied after renovation or after the berries have gone dormant in the fall. If leaves are present during application, immediately apply 0.5-1 inch of water to wash the chemical off the strawberry foliage. Otherwise severe injury may result. Do not use *Sinbar* on soils with less than 2% organic matter and do not use on *Guardian*, *Darrow* or *Micmac*, as these cultivars have shown extreme sensitivity while some growers report that *Honeoye* and less vigorous cultivars have an increase in

root rot following *Sinbar* use. *Sinbar* is limited to 8 oz/A per growing season.

Poast (sethoxydim) is a postemergent, grass herbicide. This material works well applied in late summer or early fall to actively growing grasses. Don't waste your time and the product on summer annual grasses like foxtails and crabgrass that will be killed by frost. *Poast* can be used in the fall to suppress perennial grasses such as quackgrass; control early emerging small grains, and kill winter annual grasses such as wild oats. *Poast* must be applied with crop oil.

Highbush Blueberry Weed Control: August is the time to focus on problem weeds, especially woody perennial plants. As perennial weeds begin to move carbon stores to their roots, they will efficiently move systemic herbicide to the root zone. But, so will blueberry plants! Be very careful with your application. A shielded sprayer is a must, better yet would be a wick applicator.

A 2% *Round-Up* solution (41% ai/gallon) will kill most of your problem herbaceous weeds, but if you have large woody material, you might want to use a higher solution. The *Round-Up Pro* label gives mixing

instructions for many concentrations up to a 50% solution. The cut-stem application method is also listed for problem woody plants. Using a 50-100% solution of Round-Up, apply the material directly to the woody stem using a wick applicator immediately after cutting. Many growers use a roller/wiper application to the edges of their mulched row to keep grass from encroaching. Be sure that your mulch is nice and thick and that no blueberry roots are obvious.

For pre-emergent control of fall annuals there are several choices. *Sinbar* can be used after harvest in all but 1 -year old plantings. *Devrinol* should be cultivated or watered in within 24 hours of application. *Solicam* is also a good choice at this time of year, IF you did not apply this material in the spring.

Bramble Weed Control: Late summer and fall is an excellent time to control troublesome perennial weeds like thistle, dock, smartweed, and morning glory by spot spraying with Round-Up, but take EXTREME caution to avoid getting herbicide on bramble canes.

For grass control, now is the time to apply the second *Poast* application. This should be done while grasses are actively growing. The further you get in August, the poorer the control.

To suppress winter annual germination, both *Sinbar* and *Devrinol* can be used. *Solicam*, if not applied in spring, is a good choice unless you have a new planting or light soils. Make sure that you read the label as herbicides have caveats re: soil organic matter content and rates.

Organic Options: If you are an organic grower or trying to reduce your herbicide usage, late summer is a good time to consider going through the berry plantings with a crew to hand weed or use a flamethrower in plantings.

Cultivation is an option for strawberries and materials like *vinegar* could also be very helpful for weed control. Cleaning up a patch, then applying mulch where it is appropriate will save time next season. Do not ignore late season weed control just because you don't use herbicides. (*Source: New York Berry News, Vol. 12, No. 11, August 2014*)

UPCOMING MEETINGS:

August 25, 2015 - *UMass Veg & Fruit IPM Field Walk*. 3:30-6pm Hurricane Flats, 975 S. Windsor St. South Royalton, VT
Sponsored by Vermont Vegetable and Berry Growers Association and NOFA-VT.

August 25, 2015 - *Strawberry Low Tunnels, 2:00-4:00pm* Green Acre & West Wind Fruit Farm, 3460 Latta Rd., Rochester NY 14612. Take a look at a low tunnel in a day-neutral strawberry production system. This workshop is free, rain or shine. Call Marcie at 518-272-2410 to register.

September 2, 2015 – *Exclusion Netting Workshop*, The Berry Patch, 15589 NY Route 22, Stephentown, NY 12168. 3:00 – 5:00. To Register: call Marcie at 518-272-4210. There is no fee, but a headcount is needed to make handouts. If you get a machine, please leave your name, phone, and number attending the SWD Open House at The Berry Patch. This event will happen rain or shine. Questions? Contact Laura McDermott: 518-791-5038

September 11th, Strawberry Low Tunnels, 2:00-4:00pm. Terry's Berry Farm, 284 Church St., Barton NY 13734. Take a look at a low tunnel in a day-neutral strawberry production system. This workshop is free, rain or shine. Call Marcie at 518-272-2410 to register.

September 16, 2015 —*Strawberry Low Tunnels, 3-5pm* at Stanton's Feura Farm, 210 Onesquethaw Creek Road, Feura Bush, NY 12067. Take a look at a low tunnel in a day-neutral strawberry production system. This workshop is free, rain or shine. Call Marcie at 518-272-2410 to register. See more at: <http://ulster.cce.cornell.edu/events/2015/09/16/strawberry-low-tunnels>.

September 16, 2015 – *Risk Management Education and Farm Bill Training for Wine Grapes*. 5:00 – 8:00. Newport Vineyards, 909 East Main Rd., Middletown, RI. Featuring Dr. Elsa Petit who will discuss current grape disease practices and research. 1 Pesticide credit (pending). For more information and to RSVP by Sept. 10, contact Peggy Siligato at Siligato@uri.edu or 401-640-0484.

October 15, 2015 – *All About Apples*, 5:00 – 7:00. Boston Public Market. 100 Hanover St., Haymarket Station, Boston, MA. With Dr. Wesley Autio. For more information see: <https://ag.umass.edu/events/all-about-apples>.

Nov. 17-20, 2015 – *Better Process Control School*. All Day Program. 243 Chenoweth Lab Conference Room. Food Science Building/UMass. For more information and to register, see: <https://ag.umass.edu/events/better-process-control-school-umass-amherst-campus-amherst-ma-november-17-20th-2015>.

December 15-17, 2015 – New England Vegetable and Fruit Conference. All Day Programs. Radisson Hotel, Manchester NH. For program details and registration information, go to <http://www.newenglandvfc.org/>.

Massachusetts Berry Notes is a publication of the UMass Extension Fruit Program, which provides research based information on integrated management of soils, crops, pests and marketing on Massachusetts Farms. No product endorsements of products mentioned in this newsletter over like products are intended or implied. UMass Extension is an equal opportunity provider and employer, United States Department of Agriculture cooperating. Contact your local Extension office for information on disability accommodations or the UMass Extension Director if you have complaints related to discrimination, 413-545-4800.