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. Survey fields for weak bushes and determine whether or not Blueberry Stunt or Scorch may be the cause. 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 done. Be on the lookout for Orange Rust on black raspberries and blackberries. Fall raspberries is in full swing. 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.

Spotted Wing Drosophila UPDATE: SWD were not detected in monitoring traps in MA until the last week of July. This is approximately 4 weeks later than 2013. Trap captures have also remained low compared to 2013; an average of under 10 per trap currently whereas captures were averaging over 300. Grower reports are of relatively light infestation levels in crops this year. Vigilance is still needed as the potential still exists for a sudden increase in SWD numbers and activity while fruit is ripening. See https://extension.umass.edu/fruitadvisor/spotted-wing-drosophila for current information.
ENVIRONMENTAL DATA

The following growing-degree-day (GDD) and precipitation data was collected for an approximately 2 week period, August 7 through August 20. Soil temperature and phenological indicators were observed on or about August 20. Total accumulated GDDs represent the heating units above a 50° F baseline temperature collected via our instruments for the 2014 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.

<table>
<thead>
<tr>
<th>Region/Location</th>
<th>GDD (2-Week Gain)</th>
<th>GDD (Total 2014 Accumulation)</th>
<th>Soil Temp (°F at 4” depth)</th>
<th>Precipitation (2-Week Gain in inches)</th>
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<tr>
<td>Cape Cod</td>
<td>238</td>
<td>1761</td>
<td>75</td>
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<tr>
<td>Southeast (Wareham)</td>
<td>269</td>
<td>1701</td>
<td>72</td>
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<tr>
<td>Southeast (Hanson)</td>
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<td>1876</td>
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<tr>
<td>East</td>
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<td>1946</td>
<td>73</td>
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<td>1724</td>
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<td>1959</td>
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<td>3.80</td>
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<tr>
<td>Berkshires</td>
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<td>1500</td>
<td>64</td>
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<tr>
<td><strong>AVERAGE</strong></td>
<td><strong>234</strong></td>
<td><strong>1764</strong></td>
<td><strong>71</strong></td>
<td><strong>1.59</strong></td>
</tr>
</tbody>
</table>

n/a = information not available

(Source: UMass Landscape Message #19, August 22, 2014)

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 our 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 which 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.](image-url)
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.

Phomopsis leaf blight: As lesions grow, they form a V shape, 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 Captate 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 2013 New England Small Fruit Pest Management Guide]. (Source: Pennsylvania Fruit Times Vol. 28, No. 7)

RASPBERRIES/BLACKBERRIES

Managing Mites in Raspberries and Blackberries
Rufo Isaacs, Michigan State University

Most caneberry growers in Michigan have had little need for mite management because of the abundance of predatory mites that keep pest mite populations in check. However, the current increased level of insecticide against spotted wing Drosophila is starting to cause some outbreaks of two-spotted spider mites, and these can compromise raspberry cane health and lead to reduced yield. This is especially likely inside high tunnels that tend to block the immigration of predatory mites.

Two spotted spider mite (TSSM) is the main species of pest mite encountered in Michigan caneberries, and this pest can quickly reach high abundance if the predator mites are not sufficiently abundant to suppress their populations. TSSM can be monitored through the season using a hand lens on 10-leaf samples taken weekly. Look on the underside of the leaves for the small spherical translucent eggs and the stationary/slow-moving immatures or adults of TSSM that have two dark spots in their bodies. In contrast, the predatory mites are light colored and they do not have the dots, and tend to move...
quickly across the leaf surface. These mites will require a hand lens to see, as the mites are less than a millimeter diameter. A general rule of thumb is that if the predator to pest mite populations are 1:10 or higher, then the predators should keep spider mites in check.

Treatment for two-spotted spider mite is considered unnecessary unless populations reach a threshold of one or more TSSM on 50 percent of the leaves. If predator mites are not present, the pest mite populations can far exceed this threshold. If that happens, growers will notice stippling damage on the leaves as the pest mite populations build. If it gets out of control, there can be severe leaf bronzing. Canes will typically recover from this damage eventually and put out new leaves, but the goal of mite management is preventing that situation from happening in the first place. This can be done through inundative release of predatory mites, but this approach has not yet been well-tested in Michigan farms and the releases are best done when the TSSM population is low and has not yet reached damaging levels.

Maintaining some broad-leaf weed/ground cover can also provide some habitat for predator mites, and this can also provide food for them to persist on. Fields with clean cultivation and completely weed-free management are more likely to experience mite outbreaks.

If chemical control is needed, caneberry growers have a number of miticides registered for use against TSSM. These can be grouped into those products that have activity on the immature and adult mites (Acramite, Vendex, Kanemite, soaps) and those with activity primarily on eggs and immatures (Savey, Zeal). For growers producing fall red raspberries, it may be important to highlight that Savey can be used when honey bees are active, although we still recommend that applications are done in a way that does not lead to direct application to bees, and so early morning or late evening application is suggested. The insecticidal soaps such as M-Pede, Safer, and other formulations are potassium salts of fatty acids, with activity on eggs, immatures, and adult mites. They have 0 day PHI restrictions and 12 hour re-entry. Soap products require thorough coverage, including on the undersides of the leaves to be effective. Miticides for use in raspberry have 0-3 day preharvest intervals. (Source: MSU Fruit Crop Advisory, August 6, 2013)

BLUEBERRY

What should I do About the Fallen Blueberries?

Cesar Rodriguez-Saona, Rutgers University

We know that not all fields are being harvested and growers are asking what to do about the blueberries remaining in these fields. Growers are concerned that these berries can become a source for spotted wing drosophila (SWD) oviposition, and thus possibly create a greater problem the following year. Firstly, I need to indicate that we do not know whether this statement is true, i.e., whether fruit remaining in fields will increase the likelihood of higher SWD populations the following year. It is clear that we need to know more about the overwintering biology, behavior, and survival of this fly in our region. One thing that we do know, based on studies we conducted last year, is that SWD will readily oviposit on fallen berries. Our data show that as the season progresses and the number of berries in bushes decreases and the number of berries on the ground increases, there is a likely shift in SWD preference towards those berries on the ground (see graph).
So, what can growers do to protect these berries from SWD? After harvest, we do not recommend use of insecticides in these fields. There are a couple of important reasons for this; first, it is expensive and we feel this is a waste of money because we do not know if applying insecticides after harvest has any benefits, and second, overuse of insecticides will increase the likelihood of resistant SWD populations. Alternatively, disking the row middles to bury infested berries may provide protection against SWD. Our research has shown that burying the fallen berries 5-10 cm (or 2-4 inches) below ground will likely decrease SWD emergence by 70-100%. Therefore, adoption of cultural control such as disking might be the most sustainable method to reduce SWD populations in blueberry fields that still have berries after harvest. For this, we suggest blowing the berries from the bushes, crowns, and tops of the rows into the row middles, and then disking these areas to bury the berries.

[Editor's Note: For growers with sod row middles, cultivating will not be practical. However, raking or blowing fallen fruit out from under the bushes may still be beneficial, especially if the fruit can then be crushed by driving over the ‘windrow’ with a garden tractor or mower. Each grower will have to assess the practicality of this step. In any case, do not allow grass or weeds to grow up within the crop row as this creates an even more hospitable environment for SWD to reproduce. Keep weeds and grass mowed within and between rows.]


Blueberry Plants: Few Leaves and Erratic Berry Size
Kathy Demchack, Penn State University

A number of calls have come in this year regarding blueberry plants with few leaves – though some canes often appeared nearly normal – and berries on the same plant that ranged in size from normal to very tiny.

Photo: Tom Butzler

This problem occurred over the entire state, as well as throughout the Northeastern U.S. and westward to Michigan. The widespread occurrence of this problem is a pretty good indication that this was a weather-related problem.

Laura McDermott authored an article for the last issue of The New York Berry News (for those with Internet access, it is available online( http://www.fruit.cornell.edu/nybn/newslettpdfs/2014/nybn1306.pdf )), where Marvin Pritts explained that the problem could have been due to sub-lethal temperatures that occurred from prolonged cold spells last winter. However, some folks have pointed out that we've had colder temperatures than last year's in the past, and that's true – many of us thought that last winter's cold simply felt like a "real winter", which we haven't had in a few years.... What really stood out to me though was the fluctuations, so while I think it's likely that the problem was related to low temperatures, the reason we had damage at these temperatures was the fluctuations.

Plants have various mechanisms for dealing with cold, but they lose hardiness during warm spells. Consider these temperatures from the University Park airport last winter, via the Pennsylvania State Climatologist. Dec. 21-22: Highs of 54 and 63, with overnight lows of 41 and 52, respectively. Dec. 25: High of 26, low of 15. On Jan. 6, the high was 41 but the next day, the high was 4, with a low of -9. Temperatures fluctuations were more normal during most of January and February, though there were two 5 to 10-day stretches with highs in the 40 to 50 degree range quickly followed by lows at or below zero. On March 11 the high was 64 and two days later, the low was 10. April 13 saw a high of 84 and 3 days later, the low was 23. Who knows what was happening in the plants under these conditions. What is more difficult to explain is that not everyone saw these problems, so there could be other factors (field aspect, cultivar) that are complicating the picture.

At any rate, the reason for this article is to let folks who have this problem know that they aren't alone. The next question is what to do with the plants. I expect that some of these plants won't survive, but perhaps with a little tender loving care, some will pull through. You'll be able to tell if they set buds on the wood by later this fall. The plants that were affected but survived will benefit from a good pruning to remove any dead wood and lighten the
crop load next year, and of course, avoiding other stresses like nutritional issues and water stress is always a good idea.

A different situation that could be confused with this problem is plant defoliation by yellow-necked caterpillars. Leaves sometimes disappear seemingly overnight, and usually by the time the missing leaves are noticed, the caterpillars have moved to other bushes in the field – so take a look around if you notice plants with leaves that have suddenly gone missing. Physical removal of a branch or two with the caterpillars on them is the best and simplest control. \textit{(Source: Penn State Vegetable and Small Fruit Gazette, Aug. 1 2014)}

\textbf{Putnam Scale in Blueberries}  
\textit{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. \textit{(Source: Blueberry Bulletin, Volume 30, No. 15, August 18, 2014)}

\textbf{GRAPE}

\textbf{Evaluating Grape Samples for Ripeness}  
\textit{Joe Fiola, University of Maryland}

It is critical to properly monitor and assess the fruit characteristics and maturity to make the appropriate management, harvesting, and winemaking decisions to produce the best quality grapes and wine possible. The last “Timely Viticulture” described how to take a proper sample that best represents the actual ripeness stage of the variety in that vineyard. The next step is set the priorities that will optimize fruit quality and give you the opportunity to make the best possible wine and then evaluate your sample based on that criterion.

- The critical principals here are that high quality wine is the confluence of fruit derived flavor and aroma components and for red grapes also the reduction of immature tannins.
- These do not necessarily correspond to “desired” sugar and acid ranges.
- The highest priority needs to be the quality and quantity of varietal aroma/flavor in the fruit.
  - Simply stated, to obtain a desired characteristic aroma or flavor in the wine, it must be pre sent in the grapes at the time of harvest!
  - By regular, continuous sampling you will learn through experience the succession of aromas, flavors and textures that each variety goes through.
- Depending on the degree of ripeness red grape characteristics can range from green and herbaceous to fruity and “jammy.”
- Therefore the individual sampling must be diligent to monitor for that aroma and/or flavor in the sample.

  • The next highest priority, especially for red wines, is the texture of the grape tannins in skin and the seed.
- These quality and quantity of the tannins determine the structure, body, astringency, bitterness, dryness, and color intensity of the wine. Mature tannins are critical to the production of quality red wines.
- The degree of ripeness and polymerization of the tannins will determine the astringency and mouth feel of your wine.
  • This can range from the undesirable, hard and course tannins of immature grapes, through to the desirable, “supple and silky” profile of mature grapes.

  • Procedure:
- Select a few random grapes and place them in your mouth. DO NOT look at the cluster when you are choosing the grapes because you will tend to pick more ripened berries.
- Without macerating the skins, gently press the juice out of the berries and assess the juice for sweetness (front of tongue) and acid (back sides of your tongue). With experience (and comparison against numbers from lab samples) you will be able to reasonably guesstimate the Brix and TA level of the grapes.
- Next gently separate the seeds for the skins and “spit” into your hand. The color of the seeds gives you a clue to the level of ripeness. Green seeds are immature, green to tan and tan to brown seeds is maturing, and brown seeds are mature. Ripe seed tannins are desirable as they are less easily extracted and more supple on the palate.
- Finally macerate the remaining skins and press them in your cheeks to assess the ripeness of the skin tannins. You will be able to “feel” the astringency (pucker) of the skins. The less intense the astringency the more ripe the grapes.
  • A good way to practice is to first sample an early grape variety such as Merlot and then immediately go to a later variety such as Cab Sauvignon, and you will feel the difference in the acidity, astringency and ripeness.

  • Of course, other factors must still be considered, such as the total acidity and pH
- Generally you would like to harvest white grapes in the 3.2-3.4 pH range and reds in the 3.4-3.5 range, as long as the varietal character is appropriate as described above. Remember the enologist can do a good job adjusting acidity but it almost impossible to increase variety character in the wine.
- Brix or sugar level is good to follow on a “relative” scale but levels can greatly vary from vintage to vintage.
- In some years the grapes will be ripe and have great varietal character at 20 Brix and another year they may still not have ripe varietal character at 23 Brix.
  • Disease/Rot - Monitor to see if the grapes are deteriorating do to fruit rots or berry softening.
  • Look at the short and long range forecast.
- If it looks good and the grapes have the ability to ripen further, then there may be a benefit to letting them hang a bit longer.
- If the tropical storm is on the way......
- When grapes are close to optimal ripeness, it is more desirable to harvest before a significant rainfall than to wait until after the rain and allow them to build up the sugar again afterwards. (Source: Univ. of Maryland Timely Viticulture Series: Pre Harvest)

Late Season Pest Management For Canopies
Alice Wise and Wayne Wilcox, Cornell University

After veraison, pest management is focused on keeping the canopy free from downy and powdery mildew. Most Long Island growers turn off the nozzles in the cluster zone at this time of year, easy to do with VSP training systems. Sprays for control of downy and powdery mildew should therefore have minimal contact with fruit. Nevertheless, there are some concerns with the impact of late season pest management on fermentation. Sulfur residues in sufficient quantity on berries may lead to stinky fermentations. This is not considered an issue for well clarified white musts. However, skin fermented reds may encounter problems. Besides sulfur, other end-of-season powdery mildew sprays include potassium bicarbonate (Kaligreen, Armicarb, Milstop), monopotassium phosphate (Nutrol), hydrogen peroxide (Oxidate), the biological products Serenade and Sonata and JMS Stylet Oil. The first two groups contain potassium, though there is no evidence that they raise must pH. It would be prudent, however to avoid a heavy application shortly before
harvest. No issues come to mind with hydrogen peroxide, it dissipates rapidly after application. Vivando (14 d PHI) (PHI = preharvest interval, the required interval between the last spray and harvest) is an excellent powdery material. No more than 3 app’s per season are allowed and if powdery is present, Vivando must be tank mixed with another material. Given the resistance concern, perhaps it is best to preserve Vivando for those important pre- and post-fruit set timings.

JMS Stylet Oil, 0 days PHI, is actually a very good late season PM spray. It has post-infection as well as forward activity, up to ~7 days. It will knock back European red mites as well. Several researchers have found that oil can depress Brix (sugar) accumulation. In a trial at LIHREC several years ago, two end of season app’s did depress Brix slightly. Anecdotally, other aromas and flavors were not impacted. There are local growers using Stylet Oil throughout the season with no reported negative impacts. Stylet Oil reportedly has no effect on fermentation. Read and understand the label thoroughly concerning compatibility of oil with other materials.

Primary choices for downy mildew control are copper, phosphorous acid products, Revus (14 days PHI – preharvest interval), Ranman (30), Presidio (21), captan (0) and Tanos (30). Copper can also be inhibitory to yeast and bacteria (i.e. ML) though only with very high residual copper concentrations, not likely if used prudently in the vineyard. Phosphorous acid products (0 days PHI) will keep infections in check but coverage must be excellent. PA products will not control a wellestablished DM infection. For all PA products, avoid use on raging infections due to resistance concerns. Captan has a zero day PHI and a 48 hr reentry interval. Captan is generally used early or mid-season; its use is less common post-veraison.

Finally, for DM and PM, the strobilurins and sterol inhibitors are possibilities but not the optimum choice. Resistance to PM and/or DM has been documented with some of these products. Consequently, their best use is not on existing infections. If choosing to use these products late season, it is best to rotate with other materials that are not prone to resistance. From a fermentation standpoint, there appear to be no issues with either group of materials.

Bottom line – make pest management choices carefully at this time of year. It is complicated if disease exists or a major rain looms or if trying to maintain a canopy into October or November. (Source: Long Island Fruit & Vegetable Update, Aug. 21, 2014)

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.

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. Growers in Ontario apply potassium metabisulfite to “dry out” the clusters and kill yeasts and bacteria.
Mid-symptoms of Botrytis bunch rot in grapes.

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/Vangard alternation: bloom (Pristine), bunch closure (Vangard), veraison (Pristine) and two weeks before harvest (Vangard). 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.

**Vangard**: 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*)
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)
Three Juneberry Questions ... Answered
Jim Ochterski, Cornell Cooperative Extension

Q: Commercial juneberries and saskatoons are exactly the same fruit. Why two different names?
A: The term “saskatoon berry” or “saskatoon” is a predominantly Canadian term for this tasty, dark berry that has spilled over to Michigan and a few other communities near the US-Canada border. Elsewhere, including North Dakota, Minnesota, and the Northeast US, we are using the term “juneberry” because of the close relationship with our native juneberry. From a marketing point of view, the name “juneberry” conjures its ripening season, a favorable early summer-ness, and offers an easy-to-remember / easy-to-say word. There has been some mild cultural tension with Canadian saskatoon growers, so we often use both terms now. The Saskatoon Berry Council of Canada now uses the term “juneberry” in their marketing to the US.

Amelanchier canadensis (wild juneberry) is native to the Eastern United States and has been cultivated primarily for ornamental and wildlife-attracting uses, but not necessarily for human food. Some individual plants may produce full-flavored berries, but currently yields are often comparatively low, and inconsistent with flavor compounds.

Q: Can I take juneberries from the woods in New York and plant them?
A: The wild Juneberry (or serviceberry or shadbush) you would find naturally around woodland edges is a species known botanically as Amelanchier canadensis. The species that has been domesticated for fruit production in Canada and now New York Amelanchier alnifolia.

For farming, A. alnifolia has a lot of advantages over A. canadensis. It was cultivated from wild plants on the Canadian prairies more than 80 years ago, and is known widely there as the Saskatoon berry. The variety ‘Smoky’ was selected due to its exceptional flavor in the 1950s.

Q: Now that juneberries are being grown more commonly in New York, what are the most common problems most growers are experiencing?
A: Bird damage. Cedar waxwing, American robin, and European starling are the main culprit species. Ripe juneberry plantings require full-force bird deterrence for a couple weeks: noise makers, distress calls, scary eye balloons, pop-up figures, and netting if necessary. Use the same bird deterrence as any other fruit grown in NY.

In 2014 there was partial crop loss due to cracking with extra rain in late June. As the damp 2014 summer growing season has lapsed, we are seeing notable levels of Entomosporium leaf spot (fungal).

Below: Packed Juneberries ready for sale. Photo: Juneberry grower Sophy Sidaway, Britain.

More on Sophy’s efforts in commercializing Juneberry production in the UK:

(Source: New York Berry News, Vol. 12, No. 11, August 2014)
Grasses

soil erosion. Grains and grasses can provide all of these remaining nutrients, chokes out weeds, and prevents organic matter, improves soil structure, scavenges A well-established late season cover crop increases and field conditions.

functions and legumes can add additional nitrogen. Each has strengths and weaknesses. Below is a list of several good choices, depending on your specific goals

Grasses can return a significant portion of organic matter and other nutrients to the soil if planted after removal of a seasonal crop and given enough time to mature. Kill grasses before maturity in the spring or mix with a legume to reduce the C:N ratio and supply more nitrogen for the following year’s crop.

Winter or Cereal Rye (Secale cereale) is the most common cover crop used by growers in Massachusetts. It is inexpensive, easy to get and to establish, and can be seeded until 2 weeks before a killing frost. However, it is best planted before September 15th in order to recover the available N from soil and to produce enough canopy to protect soil from erosion and outcompete weeds. It consistently overwinters here and will continue to grow in the spring, producing up to 7,000 lbs/A of biomass contributing to soil organic matter. It should be seeded with a legume to keep the C:N ratio low making more N available in the spring. Some growers are hesitant to use this cover crop because of the longer decomposition rate and allelopathy against spring seeded crops. *Seeding rate: 90-120 lbs/A broadcast; 60-120 lbs/A drilled; 50-60 lbs/A mixed with a legume.

Annual or Italian Ryegrass (Lolium multiflorum) and Perennial Ryegrass (Lolium perenne) are used by some growers because of the dense root system that outcompetes weeds and protects against erosion. Annual ryegrass can tolerate some flooding while perennial ryegrass is more cold hardy. Both are shade tolerant. These cover crops should be seeded at least 40 days before the fall frost date. The seed is small and light, so specialized equipment will be needed if seeding a large area. Seeding rate: 20-30 lbs/A broadcast; 10-20 lbs/A drilled; 8-15 lbs/A mixed with a legume.

Oats (Avena sativa) can be seeded in the late summer, will come up quickly, and are best planted before September 15th similar to winter rye. Unlike winter rye, oats will winterkill in Massachusetts, making for simpler field preparation in the spring, however, with less organic matter contribution. To maximize nitrogen carry-over to the following crop, mix with a legume that will overwinter such as hairy vetch. Seeding rate: 110 – 140 lbs/A broadcast; 80-110 lbs/A drilled; 60-90 lbs/A mixed with a legume.

Winter Wheat (Triticum aestivum) is increasingly being used as a cereal grain and as a cover crop. It is winter hardy, but does not grow as tall or mature as quickly as rye so there is no rush to kill it in early spring and risk compacting wet soils. Wheat is excellent for erosion control, scavenging N, P and K, building soil organic matter and improving tilth. Plant it in late summer to early fall; before September 15th. Best growth will be in well-drained soils with moderate fertility. Rye is a better choice on wet soils. Wheat works well as a nurse crop for legumes such as hairy vetch or clover. Seeding rate: 90-160 lbs/A broadcast; 60-120 lbs/A drilled; 60-90 lbs/A mixed with a legume.

Legumes

are a good choice if you are interested in adding nitrogen to the soil, however, it is important to inoculate seed before planting with the appropriate root nodulating bacteria that will fix nitrogen from the air. Some growers use coca cola or sugar water to help the inoculum stick to the seed and plant while still wet to keep the bacteria alive. Bacterial inoculants are specific to certain legumes and therefore must be used with the correct plant groups in order to establish. Inoculum groups are: 1) red and white clovers, 2) crimson and berseem clovers, 3) alfalfa and sweet clover, 4) pea, vetch and lentils, 5) annual medics, 6) cowpea and lespedeza. If well managed, legume cover crops can provide as much as 100 to 150 lbs nitrogen per acre to the following crop.

Hairy Vetch (Vicia villosa) usually benefits from being grown with a nurse crop such as rye, oats or wheat to help reduce matting during spring and to keep weeds down. Both the vetch and the grain can be mixed together in the seed drill. In the spring, vetch is incorporated at early bloom, typically in late May. With a good flail mower, vetch can be used in a deep zone tillage system without matting and tangling in the equipment. Seeding Rate: 25-40 lbs/A broadcast; 15-40 lbs/A drilled, 15-20 lbs/A mixed with a grass.
Red Clover (Trifolium pratense) is a short-lived perennial that is somewhat tolerant of soil acidity or poor drainage. Mammoth red clover produces more biomass for plow-down than medium red clover, but does not regrow as well after mowing. Mammoth will often establish better than medium in dry or acid soils. Sow in early spring or late summer. Red Clover can be undersown in mid-summer into corn or winter squash before it vines and other crops if soil moisture is plentiful. Seeding rate: 10-15 lbs/A broadcast; 6-10 lbs/A drilled; 6-10 lbs/A mixed with a grass.

White Clover (Trifolium repens) is a low-growing perennial, tolerant of shade, moisture and slightly acid soil. Ladino types are taller and live longer than the Dutch or New Zealand types. The clovers do not compete well with weeds unless mowed to improve lateral growth and establishment. Thus, they are suitable for use in mowed walkways or alleys. Seed tends to be expensive, although stands can last for many years, especially if mowed or grazed, since the laterally-growing stolons continue to root. Seeding rate: 7-14 lbs/A broadcast; 10-12 lbs/acre drilled; 2-6 lbs/A in a mix.

Sweet clover (Melilotus officinalis) is a biennial crop, except for the annual types called Hubam. It is deep-rooted and adapted to a wide range of soils and thus is a good soil-improving crop, as a provider of free N and “biological subsoiling”. Yellow Sweet clover is earlier maturing and somewhat less productive than white Sweet clover. Sow before August 30th for best results. Heavy growth is produced in spring after overwintering. The tall, lush growth may be difficult to incorporate without proper equipment. This should be done in late spring, or by mid-summer at flowering since growth will cease after that. Seeding rate: 20-30 lbs/A broadcast; 10-20 lbs/A drilled; 6-10 lbs/A in a mix.

Other species may be used as cover crops in disease management or in the case of the forage radish, for improving water drainage and soil structure.

Radish (Raphanus sativus), known as Daikon, tillage, forage or oilseed are also appropriate biological subsoilers, often producing 8-14 inch tap roots. With its deep roots, this crop can recover N, P, S, Ca and B for the following season, but must be planted into a crop early in the spring or else these nutrients are lost through fast decomposition and the deep root holes. This cover crop can be planted 4-10 weeks before a killing frost and typically winterkills in December or January. It can be used as animal forage. Seeding rate: 10-13 lbs/A broadcast; 7-10lbs/A drilled.

Brown Mustard (Brassica juncea) found in many of the ‘Caliente’ seed mixes is a biofumigant planted to combat root knot nematode and a variety of soil-borne fungal pathogens. It is also allelopathic against weeds. Do not plant this cover crop in rotation with any brassica crops. If allowed to flower, this crop is highly attractive to honey bees. Plant this in late August through September. Other brassica cover crops include Rapeseed or Canola and Turnips, which are often used as livestock forage. Mustards should not be planted following any brassica crops since they are in the same family. Seeding rate: 10-15lbs/A broadcast; 5-12 lbs/A drilled.

Keep in mind it is always best to plant a cover crop as leaving a field bare over winter is very damaging to soil structure, increasing erosion and reducing long term fertility. Though it may take several growing seasons or a lifetime to perfect the art of cover cropping, your soil will thank you.

Cover Crop Resources:
2) Managing Cover Crops Profitably: http://www.soilandhealth.org/03sov/0302hsted/coverscropsbook.pdf 3rd ed. Published by the Sustainable Agriculture Network, Beltsville, MD.
* Note: seeding rate recommendations may vary with regional differences.
(Source: UMass Veg Notes, Vol. 24, No. 16. August 8, 2013)
UPCOMING MEETINGS:


**October 3, 2014** – *Cornell Small Fruit Open House*, 1:00 – 4:30PM. Cornell Orchards, Ithaca NY. The open house is free and open to the public but pre-registration is required to ensure adequate transportation, handouts, and refreshments. Signs will be posted on the day of the event. Please register by phone or e-mail by contacting Cathy Heidenreich, mcm4@cornell.edu, 315-787-2367, no later than Friday, September 26, 2014.

**November 5-6, 2014** – *Northeast Greenhouse Conference*. Mass Mutual Center, 1277 Main St. Springfield, MA. For more information see: [https://extension.umass.edu/vegetable/events/northeast-greenhouse-conference](https://extension.umass.edu/vegetable/events/northeast-greenhouse-conference).


**December 10, 2014** – *Greenhouse Vegetable Production in Containers*. 9:30 – 3:45. Publick House 277 Main St. Sturbridge, MA. $40. Registration required. 2 pesticide license contact hours requested. For more information see: [https://extension.umass.edu/vegetable/events/greenhouse-vegetable-production-containers](https://extension.umass.edu/vegetable/events/greenhouse-vegetable-production-containers).

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