Winter Squash and Pumpkins—Seeing Lots of Color Out There!

Chuck Bornt, CCE Eastern NY Commercial Horticulture

This year’s heat has really pushed the maturity of winter squash and pumpkins along and I am starting to see lots of color out there. If there is any upside to this, the only thing that I can think of is that it seems grocery stores and other retailers are looking for these crops earlier and earlier every year.

First, just because vines are going down does not mean the crop is mature—it could mean that the plant has succumbed to a disease or environmental factors, etc. In the last couple of weeks I have seen a lot of bacterial issues including Angular leaf spot in many different vine crops. Typically immature winter squash will not store well and flavors may not be optimal. If the vines are dead then the best thing to do is to harvest the squash if it is reasonably mature with reasonably good flavor. Leaving it in the field without living vines/leaves will not help them mature and in fact will probably result in more fruit loss—especially those whose rinds are dark in color like buttercup, kabocha, and acorn which are much more prone to sun scalding issues.

Fruit may become infected by soil dwelling pathogens like Phytophthora capsici or Fusarium, especially during rain events. As vines go down striped cucumber beetles and squash bugs will start directly feeding on fruit causing scarring damage but also opening up entry points for diseases. And not that you would think it today, but temperatures below 50 F cause chilling injury in many of these winter squash and reduce the storage potential and eating quality.

So how do you tell? Many of the dark skinned cultivars will have a nice dark orange spot of color on the side touching the soil surface including hubbard, acorn and kabocha/buttercup types. Sweet dumpling and Delicata will also have that orange coloring on the bottom. Even the hybrid orange hubbards will have a different color on the bottom when mature. Butternut type will usually turn slightly darker tan, that is duller in color and will have a hard rind when they are mature that is difficult to penetrate with your thumbnail (if you can press your thumbnail into the skin on most winter squash, and if it still gives easily, the squash is not mature.). For me, I also look to see if the green stripes that you normally see when it is younger have completely either faded or are hardly there.

I just wanted to spend a minute on spaghetti squash—it is really important to handle this squash as gently as possible. These, buttercup and delicata, are the notorious for not holding up. Part of the reason I think is because spaghetti squash is quite susceptible to blackrot issues (the fruit phase of the Gummy stem blight pathogen that produced those brown to tan colored rings that eventually turn (Continued on page 2)
grayish black you see soon after storage and sometimes in the field). I feel that rough handling and bruising of this squash tends to result in higher levels of this disorder in storage. I also think we wait too late to harvest, so get out there and check to see if it has turned a nice yellowy tan color – if it has, get it out of the field, cured and into storage.

Onions are a little bit different, but from what I have seen and been taught, onions are mature when the handles are stiff. I know this does not sound like anything scientific, but I learned this from a cucurbit breeder long ago and over the years, it has seemed to make sense. Immature fruit will tend to have handles that seem a little bit “wobbly” compared to one that is mature and un-wobbly. This method usually works best on fields that have had a good fungicide program and do not have a lot of disease in them already.

Tips on harvesting and storing squash: These things are nothing new and really should be followed for all crops – including pumpkins!

- Handle squash as gently as possible to avoid bruising or cutting the skin. Wounds will allow soft rot bacteria and other disease to invade and reduce the storage life of your squash.

- As hard is it might be as the faster you move the more you pick up, instruct your help to “gently” place the squash in the bins/baskets. Do not throw or drop them in or if using buckets, just drop the buckets from the top of the bin! It only adds to the bruising and wounding that leads to more breakdown and lost storage potential!

- Avoid picking up squash that is wet with dews or recent rain. This increases the risk of pressure bruise and breakdown.

- If possible, try curing your squash to encourage cuts or bruises to heal over. Place in windrows in the field (this also allows the stem ooze to dry up) especially if the weather is going to be warm and dry for several days. However, this might be more difficult to do this early in the season, especially with upper 80’s and lower 90’s forecasted for this week. They can also be

placed in a warm, dry atmosphere (70-80°F) with good air movement such as a well ventilated barn or shed if temperatures can be maintained. Greenhouses or high tunnels with fans turned on and shade cloths would work nicely.

- Many growers will remove the stem especially from butternut and acorn. This practice helps reduce puncturing that can happen in the bins but squash should definitely be cured for up to a week before going into storage.

- Be sure not to pile squash too high in the bins especially if they will be stacked on top of one another. Pressure bruise is another way to decrease squash quality and storage potential. This is especially important for large fruited pumpkins if they will be harvested and placed in a barn for a while before they are to be sold – better to use a few extra bins and not load them up then have to throw the ones on the bottom of a over stacked bin away!

- After curing, move squash or pumpkins to a dry, well ventilated, warm storage area. Store squash at 55-60°F with a relative humidity of 50-70%. If humidity levels are lower than that, moisture is removed from the fruit resulting in “pithiness” or shriveling. Humidity higher than that results in conditions that favor decay organisms. Avoid chilling injury by avoiding exposing squash to temperatures below 50°F in the field or in storage.

- Lower temperatures in the storage slowly so as not to produce condensation on the fruit.

- And I know I sound like a broken record but one of my biggest pet peeves (yes, I have a few) is seeing bins and baskets of beautiful produce loaded on farm trucks or wagons and watching them bounced and jounced all over the place as the driver drives way to fast on farm roads! All of this movement can cause additional more bruising and wounding.

Post-Harvest Handling of Small-Scale Storage Onion Crops

Crystal Stewart Courtens, CCE Eastern NY Commercial Horticulture

The onions are starting to come in, so it’s about time to talk about best practices surrounding drying, curing, and storage so that the nice crops that people have grown this year stay that way.

Pulling onions

Onions should be pulled when a minimum of 50% (Ideally more like 75%) of the tops have naturally gone down, which indicates that the bulb has started the process of going dormant. After this happens, onions can still gain 25-33% of their total size, so you also want to check them to see if the roots have also started to go dormant. If the onions pull out easily, the roots have started to die off; if they still resist being pulled, they are probably actively taking up water and nutrients and the bulbs will continue to size up.

Once you do pull the onions, some people choose to start the process of drying in the field by allowing onions to sit on the surface for a few days, typically in windrows and ideally with the tops covering the bulbs to prevent sunscald. If temperatures are below 85 degrees F and a few dry days are expected, this can work well. If it’s forecast to be hotter, windrowing in the field increases chances of sunscald and black mold developing, so this practice should be avoided. If windrowed onions do get rained on, wait for them to dry out before handling, because doing so increases the chances of infection with diseases.

(Continued on page 3)
Harvesting and drying

If the tops of the onions have dried (tissue does not slide when you roll it between your fingers) the tops can be removed at this point. Cutting tops earlier is risky because bacterial diseases, botrytis neck rot, and black mold can move through the green tissue down into the bulbs. When cutting, leave 2-3 inches of neck material as a little insurance to keep the onion safe from disease infection.

Handle onions carefully during harvest, because bruising is another way that disease can enter the bulb and dramatically limit storage life.

Onion curing is a step which develops firm, dry skins which protect the bulb during storage. Onions are kept at between 68 and 86 degrees F during curing, and ideally at 70% relative humidity. Good airflow is also key to remove moisture and keep temperatures even.

Timing Onion Sprout Inhibitor Application and Managing Black Mold

Ethan Grundberg, CCE Eastern NY Commercial Horticulture

Properly timing the application of Royal MH-30 (maleic hydrazide) sprout inhibitor is equal parts art and science. Here are some tips on how to make the most of your inhibitor:

- In general, sprout inhibitor should be sprayed once onions are fully mature (a good rule of thumb is that about 50% of onion tops should be down) on storage varieties that will be kept past November.
- Spraying inhibitor before bulbs are fully mature can result in loose and spongy bulbs that are unmarketable and more prone to mold and rot in storage.
- However, waiting too long is equally problematic. Onions should still have 5-8 green leaves per bulb in order to provide enough living tissue for the inhibitor to be absorbed and translocated to the bulb. If fewer than 5 leaves remain green or if plants have severe foliar disease pressure, there is a serious risk that the maleic hydrazide will not be taken up by the plant.
- Sprout inhibitor is not a silver bullet for guaranteeing good storage, either. If MH-30 is sprayed more than two weeks in advance of harvest and the bulbs are exposed to temperature extremes and rain in the field, bulbs may be triggered to break dormancy regardless of inhibitor application and uptake.
- Care must be taken to avoid applying inhibitors at temperatures above 85 degrees.
- Sprout inhibitor will not magically make a sweet onion store as well as a storage variety. Applications should only be made to varieties that are bred for long-term storage.

One final consideration on sprout inhibitor application timing: studies have repeatedly demonstrated that bulb onions size up significantly in the last month prior to 100% falling over. One study by Davis and Jones showed that yields per acre increased by 10,500 pounds/acre in the time from 10% tops down to 100% tops down. However, other studies have shown that, in order to achieve maximum storage life, harvest should be timed around 40% lodge. So, depending upon your goals (maximum yield or maximum storage life) the timing of your inhibitor application and harvest may vary slightly.

Another question that often arises when discussing inhibitor application is whether to tank mix it with any adjuvants or fungicides. To answer the first question on adjuvants, the Royal MH-30 clearly states NOT to mix inhibitor with any adjuvants for onions grown east of the Rocky Mountains. The arid conditions of western grown onions at harvest often accelerates leaf dry down and requires the addition of a non-ionic surfactant to be added to facilitate absorption and translocation by the onions. However, the issue of whether to apply with a fungicide is more complicated. MH-30 is compatible with most fungicides, but it is recommended NOT to tank mix them. Growers also need to consider the mode of action of the fungicide being sprayed; inhibitor is formulated to penetrate the cuticle and move around the plant, so fungicides like copper and chlorothalonil that are effective on the leaf surface as protectants don’t make sense to use with MH-30. Growers also need to assess the percentage of leaves that are still green, too. If leaves are mostly dry, they will not benefit from another foliar fungicide application.

What about late season fungicide applications for black mold (Aspergillus niger)? Multiple field experiments conducted both by Cornell and University of Georgia faculty have shown that there is no statistically significant improvement in black mold reduction from late season fungicide applications once leaves have dried. The same studies have, however, concluded that in-season foliar fungicide programs that are targeted to manage other foliar diseases (botrytis, stemphylium, and purple blotch) DO reduce the incidence of black
mold in storage. Those interested in more detail on these trials should refer to the research done by Hunt Sanders et al in 2013-14 starting on page 37 at https://secure.caes.uga.edu/extension/publications/files/pdf/AP%20114_1.PDF.

So if late season fungicide applications don’t reduce the presence of black mold on onions, what will?

- As already mentioned, keeping up with an effective foliar fungicide spray program in season
- Ensuring the onions are fully mature and dry at harvest, which can be facilitated by deeper undercutting early in the harvest process or lifting later in the season once sunburn is less of a concern
- Minimizing bruising and physical injury to onions during the harvest process
- Most importantly, focusing on creating the ideal post-harvest curing and storage conditions! Ideal curing conditions are 75°F-80°F at 70% humidity for about 2 weeks. Once curing is complete, both temperature and humidity should be gradually lowered to near 33°F and 50%, respectively. Since black mold thrives at temperatures above 60°F and at relative humidity of 80% and higher, hot and humid storage and curing conditions create a prime environment for it to grow.

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Maintaining Brussels Sprouts Quality Into the Fall Season

**Elisabeth Hodgdon, CCE Eastern NY Commercial Horticulture**

The fall season is around the corner, and Brussels sprouts are sizing up around our region. In order to ensure a great yield of quality Brussels sprouts this fall, there are a few tasks to do in the late summer:

**Manage insect pests (be on the lookout for cabbage aphid)**

Caterpillar pests (cabbageworm, cabbage looper, etc.), flea beetles, and cabbage aphids (Fig. 1) feed on leaves and sprouts, reducing marketable yield. Cabbage aphids are particularly problematic in Brussels sprouts compared with other brassica crops, because these tiny gray aphids nestle in the forming leaves of the sprouts late in the season. Once aphids are under the leaves, they are difficult to reach with insecticide sprays, and cannot be washed off post-harvest. If sprouts are severely infested, they are rendered unmarketable.

To manage cabbage aphids effectively, begin scouting in late summer. Aphid outbreaks often occur in one or a few isolated spots in a field to start. Once aphids are crowded, winged individuals develop that fly within the field to find other host plants. Since aphids reproduce clonally, their populations grow very rapidly. I often notice that cabbage aphids situate themselves first on the top growing point of the plant, and then move into the sprouts. If you find that >10% of plants have at least one aphid, insecticide application is warranted. Several insecticide options are available, including neonicotinoids (Assail, Actara, Admire Pro), spirotetramat (Movento), flonicamid (Beleaf), and cyantraniliprole (Exirel). In particular, insecticides with translaminar movement are most effective. For organic growers, alternating sprays of M-Pede and Azera achieved control of cabbage aphid in a University of New Hampshire study (see Additional Resources).

**Manage disease**

Alternaria (Fig. 2), black rot (Fig. 3), downy mildew, and other diseases can cause discoloration on the outer leaves of sprouts. In last week’s podcast episode, Ethan Grundberg and Teresa Rusinek on our team covered Alternaria and downy mildew management in brassica crops. Alternaria, which is very common in our region, causes target spot dark

(Continued on page 5)
lesions on Brussels sprouts leaves and black spots on sprouts. Removing lower leaves (which is usually only practical in small plantings), if plants do not self-prune, helps with disease management by increasing air flow within the leaf canopy. Prune to encourage sprout development in late summer and fall

Research has shown that pruning off the main growing point (topping) encourages sprouts at the top of the plant to size up prior to harvest. Removing the growing point alters the hormone dynamics in the plant (auxin levels) and encourages the plant to divert resources into enlarging existing sprouts, rather than continuing to produce very small sprouts at the top of the plant that are not marketable at the end of the season. Topping Brussels sprouts also improves the aesthetics of the stem for retail sales in which sprouts are sold on stems.

When should you top your Brussels sprouts plants? The general rule of thumb is to top plants when the largest sprouts are between 0.5-1” in diameter. The date of topping varies by variety and the growing season, and can’t be predicted reliably by calendar dates. A University of New Hampshire trial found that marketable sprout yields can be increased when plants were topped at this phenological stage, when harvest was no more than 60 days away. Topping too early reduced yield, and very late maturing varieties did not benefit from topping (see Additional Resources).

References and Additional Resources


(Continued from page 4)

Managing Basil Downy Mildew

*Ethan Grundberg, CCE Eastern NY Commercial Horticulture*

Basil downy mildew (BDM) has been active for a few weeks in the region already. The first symptom of BDM is usually the development of angular yellow patches on the top side of basil leaves, followed shortly by the arrival of purplish gray spores on the leaf underside. After sporulation, the yellow patches turn brown and gray.

Growers have increasingly been planting the variety ‘Eleonora’ by Vitalis Organic Seeds due to its intermediate resistance to BDM. However, ‘Eleonora’ is still very susceptible and growers should still monitor their plantings of resistant varieties carefully. Purple and Thai type basils typically have better resistance than sweet Genovese types. Rutgers released three new BDM-resistant sweet and Genovese basil varieties in 2018: Obsession DMR, Devotion DMR, Passion DMR, and Thunderstruck DMR. These varieties have been included in field trials at the Long Island Horticultural Research Laboratory and have demonstrated superior resistance compared to other commercially available varieties with intermediate resistance. All three are available through VDF Specialty Seeds (https://www.vdfspecialtyseeds.com/). There are several other commercially available basil varieties on the market now with improved BDM resistance, including Prospera and Amazel.

However, Dr. Meg McGrath recently wrote the following: “New resistant varieties have exhibited better resistance than those commercialized previously, but plant resistance is rarely complete, thus some symptoms are expected warranting fungicide treatment when symptoms are first found to achieve good control. Pathogens have demonstrated ability to evolve to overcome resistance. Meg McGrath is involved with a multi-state project on this disease that includes researchers who will be looking at genetic variation in the pathogen. Examining isolates from resistant varieties is of special interest. If you see downy mildew on a resistant variety, please contact her at 631-727-3595 or mtm3@cornell.edu.”

The best cultural practices to avoid BDM are those that minimize leaf wetness and humidity levels, especially in high tunnels. In order to effectively manage BDM, fungicide applications should begin before visual symptoms develop. Ranman (cyazofamid; FRAC code 21), Revus and Micora (mandipropamid; FRAC 40), and Quadris (azoxystrobin; FRAC 11) are all labeled for use on basil for BDM. Studies conducted on Long Island in 2013 found that Revus and Ranman were most effective at controlling BDM on both ‘Italian Large Leaf’ and ‘Eleonora’ varieties. Revus and Ranman can be
rotated with any number of phosphorus acid (FRAC 33) fungicides labeled for use on basil like ProPhyt, Fospite, Fungi-Phite, Rampart, pHorsePhite, and K-Phite. The same study tested the efficacy of several OMRI-approved fungicides as well (Regalia, Actinovate, and Trilogy), but found them to be mostly ineffective. Some studies have found Procicid (3.5% citric acid) to be somewhat more effective for organic growers and was deemed NOP compliant by the Washington State Department of Agriculture. Double Nickel 55 (Bacillus amyloliquefaciens), MillStop (potassium bicarbonate), Trilogy (neem oil), and OxiDate (hydrogen dioxide) are also labeled for use on basil for suppression of BDM. Since OxiDate is a contact fungicide with no residual activity, it should only be used in conjunction with another fungicide. If you are unable to control BDM on your crop, be sure to disk in the infected plantings as soon as possible to help reduce the inoculation source for other plantings.

For more information on BDM, please refer to [http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html](http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html) and [http://blogs.cornell.edu/livegpath/extension/basil-downy-mildew/](http://blogs.cornell.edu/livegpath/extension/basil-downy-mildew/).

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**USDA CFAP Payments are Now Available for Cut Flowers, Nursery Crops, and Microgreens**

Elizabeth Higgins, CCE Eastern NY Commercial Horticulture

On August 11, the USDA announced that nursery crops, cut flowers and microgreens are now eligible for CFAP payments! Nursery crops means decorative or non-decorative plants grown in a container or controlled environment for commercial sale. Cut flowers includes cut flowers and cut greenery from annual and perennial flowering plants grown in a container or controlled environment for commercial sale. Cornell Cooperative Extension and New York Farm Bureau submitted data to USDA last June in support of expanding CFAP to nursery, cut flower and microgreens growers and so we were really pleased to see these crops included.

Farms growing these crops had been left out of the initial CFAP program, but many suffered devastating losses this spring. In late May, I conducted a statewide survey in support of the USDA appeal and found that growers in NY with potted ornamental plants and bedding plants like petunias lost almost three of their revenue compared to last year in the spring due to the fact that landscapers and nurseries/garden centers that were not producing/selling food crops were not exempt businesses and were forced to close. Cut flower growers across NYS also lost catering and restaurant clients and events. Thanks to many of your responses to this survey – as well as comments by many in these industries across the US cut flower and nursery growers are now eligible for CFAP.

In addition to nursery crops and cut flowers, micro greens are also now included in CFAP and are eligible for payments as a specialty crop. For microgreens there is a $7.15/lb payment for microgreens that were sold between January 15th and April 15th that left the farm but payment was not received (or were donated because markets collapsed) and there is a $3,850 per acre payment available for microgreens that were unable to be sold due to market loss.

CFAP payments for nursery crops and cut flowers will be based on a percentage of the producer’s wholesale value of inventory. Payments will be the sum of CARES Act payments and CCC payments as follows:

**CARES Act Payments:** For nursery crop and cut flower inventory that was shipped but subsequently spoiled or is unpaid due to loss of marketing channels between January 15, 2020, and April 15, 2020, the wholesale value of the inventory that was shipped that spoiled or is unpaid, multiplied by 15.55 percent. This would include flowers and nursery crops that were donated because of market loss; and

**CCC Payments:** For nursery crop and cut flower inventory that did not leave the farm between January 15, 2020, and April 15, 2020, due to a complete loss of marketing channel, the wholesale value of the inventory ready for sale that did not leave the farm by April 15, 2020, and that will not be sold due to lack of markets, multiplied by 13.45 percent. This would include crops that spoiled or were destroyed due to market loss.

Nursery crop and cut flower inventory that may be sold after April 15, 2020, is not eligible for CFAP.

USDA is accepting applications for CFAP until September 11, 2020. You can learn more about applying at [https://www.farmers.gov/cfap/nursery](https://www.farmers.gov/cfap/nursery). Responses from growers in other commodities who have applied for CFAP is that the application process is relatively straight-forward and payments have come quickly. USDA FSA has been working hard to help growers through the process. You can apply on-line or download forms and work with USDA FSA office serving your county to complete the application.

If you have additional questions, you can also contact me (Liz Higgins) at [emh56@cornell.edu](mailto:emh56@cornell.edu) and I will try to find out the answer.
ENYCHP 2020 Haikus

A long, long season.  
So tired. At least I have  
A watermelon

The hotter it gets  
The more insects multiply  
Ice cream does not help

Western Bean Cutworm  
Bucket traps so full of moths  
Where are the eggs, though?

No summer weddings  
Farmer tans are my new art  
How ‘bout those white feet?!

Which disease is it?  
Those tomato leaf lesions  
Canker, speck, spot, blight?

Oh hi winter squash  
Did you know it’s still August?  
Did I lose a month?
Events & Updates

2020 Vermont Vegetable and Berry Grower Webinars
Wednesdays from 12:00 to 1:00pm
http://www.uvm.edu/vtvegandberry/Webinars2020.html

August 26: Fall Cover Crop Options. Becky Maden and Laura Johnson.
Coming in September...
- Growing Saffron
- Leafy Greens in Winter Tunnels
- Irrigation Tips

Project Planning for Post-Harvest Efficiency, Profitability, & Food Safety
A Series of videos developed by UVM Extension Agricultural Engineering
https://www.youtube.com/playlist?list=PLRhtZw1o6RdfFlbLS9FRNf4GcLmeNU9M

UMass Agricultural Water Twilight Series
https://ag.umass.edu/vegetable/events/agricultural-water-twilight-series-part-i-soil-moisture-monitoring-irrigation

The UMass Extension Vegetable Program is offering a series of online twilight meetings next month all about water! They welcome extension specialists and farmers from Massachusetts and beyond to cover a range of water-related topics. More details and registration info coming soon!
- Wednesday, Sep. 16, 6-7:30 pm: Water use monitoring tools and efficient irrigation, water use regulations
- Wednesday, Sep. 23, 6-7:30 pm: Water sources, mapping and inspecting water distribution systems, and water testing for FSMA
- Wednesday, Sep. 30, 6-7:30 pm: Post-harvest water quality and sanitizer use

Corn Trap Counts

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