Cornell University Cooperative Extension

# Eastern NY Commercial Horticulture Program

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# Weekly Vegetable Update

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Tcec c
Af ai ml
Ac 83/6-637-40/1
Ck g8cdb13@cornell.edu

k G
Nf ml c83/6-34/-523.
Ck g8adi2@cornell.edu

Rc c P gl ci
Nf ml c8623-47/-5//5
Ck g8tr28@cornell.edu

A c
Ac 83/6-553-../6
Ck g8cls263@cornell.edu

g c S gaf
Nf ml c8623-122-/012
Ck g8mru2@cornell.edu

Fruit
Laura McDermott
Cell: 518-791-5038
Email: lgm4@cornell.edu
Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu
Berries & Grapes

Dan Donahue
Phone: 845-691-7117
Email: djd13@cornell.edu
Tree Fruit

Anna Wallis
Phone: 443-421-7970
Email: aew232@cornell.edu
Grapes & Tree Fruit

Business and Marketing
Bob Weybright
Phone: 845-797-8878
Email: rw74@cornell.edu

*Layout:*
*Carrie Anne Doyle*

*Content Editor:*
*Teresa Rusinek*

## Regional Updates:

### *North Country—Clinton, Essex, northern Warren and Washington counties*

We had one last taste of summer with hot, sticky weather at the end of the week. After a few days of clear, mild sun we're heading into a week of nights in the 40's and 50's. Still no reports of late blight or cucurbit downy mildew in this northeast corner of the state. Fall crops look great.

Late season sweet corn with aphid infestation.

### *Capital District—Albany, Fulton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, southern Warren and Washington counties*

Weather has been great for harvesting fall crops like winter squash and pumpkins, though nights are dipping back into the 40's and 50's which is slowing down ripening and starting to damage squash that are still in the field. Overall fall crops from brassicas to late summer squash look very good. Growers should make sure to keep scouting for insects like flea beetles which can still reach threshold and require control.

Late sweet corn looks good, though staggered plantings continue to end up coming in at the same time, leading to excess and scarcity depending on the timing. We have been seeing a fair number of aphids on sweet corn. The hot weather we had seems to have allowed aphids to survive many controls. We think that pyrethroid insecticides might not have been completely effective due to the weather, paired with the fact that aphids can reproduce rapidly during warm weather. If populations are still high, another spray might be warranted. Heavy aphid infestations on ears or above ears, with honeydew dropping on ears, can make corn unmarketable.


Squash bug feeding on fruit near harvest.

### *Mid-Hudson Valley—Columbia, Dutchess, Greene, Orange and Ulster counties*

In general, conditions remained dry for most of the region, and I think for this reason we have not seen much spread of late blight in tomato/potato and downy mildew in cucurbits. Flea beetle activity has picked up in some brassica plantings. Pumpkin/Squash harvest is looking very good in this region. Quality and yield are excellent. In a few pumpkin fields, I have found squash bugs in high numbers on mature or near mature fruit. (Note that summer squash such as zucchini and crookneck are also susceptible to attack.) Normally they feed on foliage, but late in the season, especially when vines are down, they will also feed on fruit. Be careful leaving fruit out in the field longer than you need to as heavy feeding by squash bugs can "deflate" fruit and shrink handles. Removal or thorough destruction of crop debris and other field trash after harvest will remove overwintering shelter for the bugs. Deep tillage will bury and kill overwintering adults.

# Leafminer Damage Showing Up in Various Crops

This week there have been sightings of leafminer damage in several vegetable crops. Overall, they prefer greens like lettuce and spinach but will happily oviposit in many crops.

Damage can be devastating for crops that are harvested for their foliage, while for others it is merely an annoyance. It is characterized by little serpentine roads in the leaves of the crop. This is caused when the larvae burrow and feed between the layers of the leaves. Fecal material can often be seen in the mines, furthering the unsightly damage. Very heavy mining, especially in small plants, can reduce plant vigor. Oviposition (egg laying) can leave marks on leaves and/or allow pathogens in, further increasing damage.

Adult leafminers (there are a few species out there that damage vegetables) are small (2-3mm) black and yellow flies that may be seen resting on leaves.

Some systemic and contact insecticides can be effective for control but often damage happens quickly and the greens of the crop are soon unmarketable. Controlling the adults is not terribly effective either, as they fly quickly and "don't hang around" to get sprayed. Once the larvae have pupated, chemicals are ineffective. Leafminers have been known to develop resistance to insecticides quickly, so if you are seriously interested in chemical controls, be sure to research what might even have a chance of being effective. Thorough coverage with high water gallonage is recommended for best control. There are natural predators but most are quite sensitive to the insecticide applied season-long leaving conventional farms in a precarious spot later in the season.


Serpentine leafminer damage on broccoli raab. HGIC, U. MD Extension. More at http://extension.umd.edu/growit/photos-leafminer#sthash.VbE78mUi.dpuf

The best management comes from cultural controls such as:

- Managing weeds at the edges of fields where these pests can build populations while waiting for your crop to emerge.
- Rotate crops. Any field you had leafminer damage in this year should not have a susceptible crop in it next year. Remember, adults travel well. If you had lettuce in fields C&D this year with leafminer damage, putting sweet corn there in 2015 and the lettuce in fields B&E will result in similar levels of damage.
- Investigate tolerant varieties. There are not too many options for this management technique but some vegetable varieties are more or less attractive to the adults.

And, for those of you with greenhouses: leafminer can be problematic in greenhouses as well. If you have a field problem, be extra careful not to bring it in the greenhouse this fall. *-MRU*

# Attention Leek Growers: Have You Seen This Kind of Damage?

Leek moth is a relatively new pest that feeds on all members of the Allium family including onions, garlic, leeks, shallots and chives. So far, it has only been found in northern New York and Vermont, but it is slowly moving south and we are asking all growers to keep an eye out for this pest, and let us know if they see anything suspicious.

Not surprising, given its name, one of its favorite hosts is leeks. Leek moth has 2-3 generations per year so as the season progresses, its population builds. If your onions made it through the season unscathed, please take a look at your fall leeks to see if you have any damage similar to that in the photo at right.


For more information about leek moth, including many photos of damage on each host crop, visit http://web.entomology.cornell.edu/shelton/leek-moth/ or search for 'leek moth cornell' in your browser. And please, contact any of us if you suspect you have it. *-ADI*

# Tips for Best Onion Bulb Quality

*By Christy Hoepting, Cornell Vegetable Program*

**N gle lb glb m gle**

- Do not pull onions and leave them in the hot sun when temperatures are in the high 80s and into the 90s, because they can get l a b, especially if the relative humidity is high and they are pulled on the green side. Secondary bacterial pathogens invade tissue damaged by sunscald resulting in rotten bulbs.
  - o A common technique used for field drying is to orient the pulled onions so that the leaves lay over top of the bulbs.
  - o Some growers move the pulled onions with the tops on into a greenhouse or high tunnel to dry. Temperatures should be held below 85 °F, which will probably require leaving everything wide open. Black shade curtain/cloth over the house can also help to moderate temperature. Ensure good air movement.

**Rmnngle lb f c gle**

- Do not harvest onions when conditions reach 90 °F and 90% relative humidity, because ai k mb could develop. Harvest dry onions during the cooler part of the day as long as they are not wet from dew or rain or wait until a cooler day.
- Storage-bound onions should only be topped when the neck is dry and has no green tissue (i.e. the tissue does not slide when you roll the neck between your fingers). a c g bg c c , m g l cai m (caused by the fungal pathogen, *Botrytis allii*) and ai k mb can enter into and move through green tissue into the bulbs. These diseases do not infect or move in dry tissue.
- Leave 2-3 inches of neck on the bulb when topping. This increases the distance from the cut surface to the bulb for fungal and bacterial pathogens to travel. Theoretically, if the neck dries down before the disease gets to the bulb, the bulb should be sound in storage.
- If onions are dying standing up due to excessive leaf dieback caused by disease or other stress, and they are not lodging, they should be pulled and note that it may take a bit longer for the necks to dry on these onions.
- Conduct harvest practices when the weather is dry. Ideally, onions should not be handled when wet to prevent skin quality issues from m l gl , caused by *Botrytis cinerea* and ai k mb. When wet harvested onions are placed into boxes, it takes longer for them to cure properly, and the added moisture can stimulate disease development and mmgle, which in turn will stimulate n m gle.

Freshly pulled storage-bound onions will not be topped until the neck is dry and tight to ensure best bulb quality. *Photo: C. Hoepting.*

- Avoid bruising during harvest procedures. gc provide direct entry points for diseases to get started.
  - o Reduce drops to 6” and pad sharp surfaces.
  - o On mechanical harvesters, minimize mechanical injury during harvesting by adjusting the chain speed to make sure the chain is always full. This will help reduce rolling and bumping of the bulbs.

**A gle**

For optimum storage quality, onions must be cured soon after harvest. Curing decreases the incidence of l cai m and a c g bg c c , reduces c m during storage and is desirable for development of good scale color.

- Optimum conditions are 68-86°F and 70% relative humidity for at least 12 to 24 h. Best skin color develops at 75-90°F.
- Artificial curing can be done with outside air, which is heated to approximately 77°F or 3-5 °F above the ambient air temperature. Higher temperatures, up to 90°F can be used if onions are of high quality with several layers of good skins.
- Avoid temperatures greater than 90°F, because this is favorable for development of a c g bg c c
- Avoid temperatures greater than 82°F, because ai k mb is more likely to develop at this temperature.
- A lower temperature, down to 68°F should be used if onions are nmm igl cb, have been m afcb dm or have a c g bg c c .

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***Tips for Best Onion Bulb Quality, continued from previous page***

- Relative humidity should not fall below 65% or exceed 80%. RH going into the boxes should ideally be 50% and less than 100% coming out.
- Airflow should be no less than 3 cubic feet per minute per cubic foot of product.

**Mlgnl m ec**

- To ensure maximum storage life, onions should be stored after curing. The optimum temperature for long-term storage of onions is 32°F with 65-70% relative humidity, but it is important to bring them down to this temperature slowly.
- Get them out of the sun or protect them from direct sunlight; exposure to light after curing will induce greening of the outer scales.
- Damaged or rotten bulbs should be graded out before putting them into storage. Damaged bulbs give off moisture which is favorable for development of diseases in storage. Rotten bulbs can ooze onto healthy bulbs and stain them.
- Avoid condensation by not circulating air onto onions that is a warmer temperature than the onions.

## Horticulture Research at the Cornell Willsboro Farm

Folks in the southern part of our Eastern NY region may not be aware that Cornell owns a research farm in Willsboro, in Essex County. This farm has a wide variety of research projects, coordinated by farm manager Mike Davis and his crew, including field crops, soil issues, bio-fuel, cold hardy wine grapes and horticulture crops. We'll put a full article about the farm in one of our winter issues, but for now here's a quick update on two of our high tunnel projects that might be of interest to vegetable growers. Both of these projects are still underway so the data is not complete; more on that this winter.

For now, note how well the cucumbers (greenhouse variety Tamazula) are growing this late in the season (Figure 1). This trial is comparing two growing methods: training to a single leader versus letting the plants climb up a horizontal trellis. As of early September both crops are doing well and continuing to bear. Powdery mildew can be a problem in tunnels but this variety has been untouched.

Another trial is looking at the feasibility and practicality of growing summer crops other than tomatoes in high tunnels, in an effort to work in some kind of crop rotation. We are growing double crops of basil, bush beans and zucchini, as well as trying ginger and sweet potatoes. We have a duplicate planting of sweet potatoes outside and will compare the yield. Powdery mildew is as much of a problem for zucchini in the tunnel as it is outside, as can be seen in Figure 2. *-ADI*

Figure 1. Two methods of training cucumbers are being studied. The taller blocks are trained to a single leader with twine and clips, the shorter block has been left alone to grow up and over a trellis. Yield data is still being collected. Photo taken Sept 5 and still no powdery mildew. *Photo by ADI*

Figure 2. Short season crops are being trialed in the high tunnel at Cornell's research farm in Willsboro. This second planting of zucchini has severe powdery mildew. Bush beans, basil and sweet potatoes are also being evaluated as possible summer rotations with tomatoes. *Photo by ADI*

# Flea Beetles and more Flea Beetles!

I saw a huge population of Crucifer flea beetles yesterday doing a pretty good number on some cabbage, kale and Brussel sprouts. Even though larger plants can tolerate some damage, if you read the Alternaria article in this week's newsletter you will note that flea beetles can actually spread Alternaria. They were also feeding on newly developing Brussel sprouts and cabbage heads, potentially making them either unmarketable or you have to spend so much time peeling the outer layers off that it doesn't make sense labor wise to try and market them.

Conventional growers have a number of materials that are effective including Warrior (or other labeled formulations), Baythroid, Seven etc. In reviewing some of the efficacy trials for organic insecticides, it appears that Entrust, Pyganic and azadirachtin containing compounds (such as Aza-Direct, Ecozin Plus etc.) insecticides can be effective, but may require multiple treatments and using an adjuvant or spreader sticker is recommended. However, read the labels carefully as there is mention of potential injury with azadirachtin and some oils.

Rowcovers or insect netting could also be used granted there is not already an infestation occurring and you can secure the edges tightly. *-CDB*


Figure 1: Alternaria lesion and flea beetle feeding damage on cabbage leaf.


Figure 2: Flea beetles feeding on crucifer leaves.


Figure 3: Flea beetle damage and Alternaria lesions on Brussel sprouts. Many of these will be unmarketable or will have to be peeled adding to labor costs.

# Pumpkin and Winter Squash Harvest and Storage Reminders

The overall pumpkin and winter squash crop looks pretty good across the region. If you are planning to store any of your squash into the winter, be especially careful that squash is mature, wound-free, and fully cured before storing. Now all we need is the next 6-8 weeks of rain-free weekends to get them marketed! The following quick tips are good reminders of best practices.

- Handle squash and pumpkins as gently as possible to avoid bruising or cutting the skin. Wounds will allow soft rot bacteria and other disease to invade and make the fruit unmarketable and reduce the storage life of that crop. Gently place in bins rather then load buckets or baskets and "dump" them in bins. This will take more time, but will pay off with better quality fruit for storage and market.
- Avoid picking up squash and pumpkins that are wet with dews or recent rain. This increases the risk of pressure bruise and breakdown especially if you are placing them in bins.
- 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 . Alternatively, place squash in a warm, dry atmosphere (70-80°F) with good air movement such as a well ventilated garage or barn, if temperatures can be maintained. Greenhouses or high tunnels with fans turned on would also work nicely. However, be careful not to expose the fruit to too much intense sunlight as sunscald can occur.
- 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. If not allowed to cure before placing in bins, several things can happen such as oozing from the wound onto other fruit and more decay problems.
- 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.
- When transporting squash and pumpkins from the field to the market or storage, be sure to drive carefully, especially on bumpy farm roads. The jostling of fruit can cause more punctures and pressure bruise and reduce the quality of your fruit.

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*Squash Harvest and Storage Reminders, continued from previous page*

- Try to avoid chilling injury. It is very important to try and remove squash from the field before a frost. Chilling injury occurs when pumpkins and squash are exposed to temperatures below 50°F in the field or in storage.
- After curing, move squash or pumpkins to a dry, well ventilated 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.
- Continue to scout your crops, even if harvested in windrows in the fields. I have seen late, heavy infestations of Striped cucumber beetles feed on the rinds of pumpkins and some winter squash rendering them unmarketable. They can also bore holes into the sides of fruit as well. Additional insecticide treatments might be needed.

More details on storage conditions can be found in last week's newsletter in "Pumpkin and Winter Squash Harvest and Storage" by Ruth Hazzard, UMASS Extension. *-CDB*

# Alternaria Leaf Spot of Cabbage and Other Cole Crops

*By Adrienne Gorny, Rachel Kreis, and Helene Dillard, Dept. of Plant Pathology and Plant-Microbe Biology. Edited by Christy Hoepting, CVP*

**Cl mb a gnl**

Alternaria Leaf Spot is a common disease of cabbage caused by the fungal pathogen *Alternaria brassicicola*. In New York, it is commonly found on many types of crucifers, including kale, cauliflower (Fig. 1), Brussels sprouts (Fig. 2) and broccoli.

**Cbcl ggla gnl**

Symptoms of Alternaria Leaf Spot on Cole crops may first develop on young plants in seedbeds, where leaf spots, stunting, or damping off may occur. Dark brown to black leaf spots may appear on tissues of any age and vary in size from pinpoint to 2-inches in diameter. The leaf spots enlarge in concentric circles and mature lesions have a bull's eye type appearance (Fig. 3). The species that occurs most frequently in New York (*Alternaria brassicicola*) will produce black sooty colored spores within the leaf spots. The black spores easily detach from the leaf if touched and are visible on the leaf surface, fingers and tools.

**Bg c c A a c l b Cngbck gmne**

*Alternaria brassicicola* may be seed-borne, soil-borne, and wind-borne. Seeds may be contaminated by surface-borne spores or internally infected by the fungus. The fungus can also survive in infested crucifer debris in the soil or on cruciferous weeds. The spores can be blown in the wind for long distances and have been documented to travel on air currents for 1.1 miles. Spores may also be carried by tools, equipment, people, and animals throughout fields. In addition, it has been observed that flea beetles can transmit the fungus to healthy plants when the insects first feed on infected plants (Fig. 4).

Dispersal of spores occurs during the warmest, driest part of the day; however, germination of spores occurs when the leaf surfaces are wet. Research has shown that rain or dew that persists for more than 9 hours is required for germination and infection to occur.

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Fig. 1. Cauliflower head infected with Alternaria leaf spot.


Fig. 2. Brussels sprouts infected with Alternaria.


Fig. 3. Alternaria leaf spot on cabbage leaf. Lesions are dark brown to black and enlarge in concentric circles.

***Alternaria Leaf Spot , Cole Crops, continued from previous page***

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- Use disease free seed.
- Some varieties show more tolerance than others; growers should avoid using varieties that have shown chronic problems with this disease.
- Incorporate crop residue immediately after harvest to remove this as a source of disease for other plantings and to hasten decomposition of the infested material.
- A minimum two year crop rotation is recommended, alternating with non-cruciferous crops. Cabbage should not be planted in or near fields or seedbeds that have been used for crucifers the previous year.
- It is recommended to start scouting fields, seedbeds, and greenhouses beginning at emergence for symptoms of Alternaria Leaf Spot.
- Protectant fungicides should be used *before* disease levels are high and uniform coverage of fungicides is essential.
  - In recent Cornell studies, Helene Dillard found that different strains of ALS respond differently to different fungicides with not all strains being susceptible to all fungicides. Therefore, for best control, when disease pressure is threatening head quality, a tank mix of Quadris/Quadris Top + Bravo should be used, perhaps alternated with Switch or Inspire Super.
  - Note that there are restrictions on the number of consecutive applications and rotation partners that can be used with Quadris/Quadris Top and Inspire Super for resistance management. For example, Inspire Super, Quadris and Cabrio cannot be used as rotation partners with Quadris Top.
  - Bravo, Quadris and Cabrio will also provide some protection against downy mildew, which can also cause problems to heads in wet and cool weather.
  - The preharvest interval for Bravo, Inspire Super and Switch is 7 days and 1 day for Quadris Top.
- Straw mulch can reduce disease incidence by providing a protective barrier against soil-borne inoculum.
- Excessive irrigation should be avoided and good weed control maintained.
- Storage cabbage should be handled carefully during harvest to avoid bruising and other wounds that will allow easy entry of the fungus.
- Storage facilities should be thoroughly cleaned of debris before harvest and wooden storage boxes disinfected.

Fig. 4. Flea beetles can transmit Alternaria to healthy plants. *Photo: C. Hoepting*

# Hops Harvest in Full Swing!

Because we've received a number of inquiries about timing hops harvest, drying, and storage, we decided it would be useful to pass on the following excellent article from Michigan State University Extension for growers to have on hand. Like New York, Michigan is also currently experiencing a hops renaissance under very similar growing conditions and growing pains of a fledgling agricultural economy.

See the additional link to UVM's hops moisture calculator and how-to video at http://www.uvm.edu/extension/agriculture/engineering/?Page=hopscalc.html. *-Justin O'Dea, CCE Ulster*

**F c Rgk c nn m af g e dm F mn E m c**

*By Erin Lizotte, posted on August 21, 2014, MSU Extension, http://msue.anr.msu.edu/news/harvest_time_approaching_for_hop_growers_1*

Determining the correct harvest date for hops is a mix of art and science and has a big impact on the quality of the final product. Hop harvest in Michigan occurs primarily from late August through September with actual dates depending on cultivar, exact location and conditions during the growing season. When attempting to determine harvest timing, growers should consider cone maturity and moisture content, weather conditions, pest pressures and market influences.


How to Video: Determining Hop Harvest Moisture and Ideal Storage Dry Matter: https://www.youtube.com/watch?v=TfUYXu4-0-s&feature=plcp

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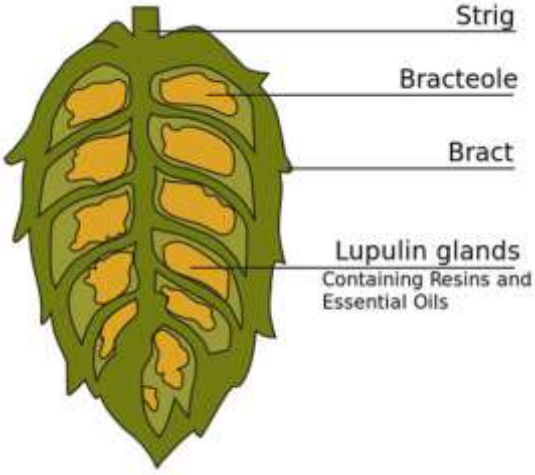
***Hops Harvest, continued from previous page***

The three primary components of brewing value of the hop are the alpha-acids (bittering agent), beta-acids (preservative), and essential oils (aroma). Recent work at Oregon State University by Thomas Shellhammer continues to shed light on the importance of harvest dates and the potential effects on these brewing qualities. Of particular importance to Michigan's aromatic hops producers is the data generated regarding essential oil content, thought to be the primary source of aroma. Essential oil content is found to increase well past the typical commercial harvest dates, perhaps lending credence to concerns that we may be harvesting our hops before the optimal timing. Not surprisingly, hops harvested at different dates produced beer with significant, distinguishable differences in sensory analysis testing, indicating the importance of harvest date on beer quality.

Brewers Gold hop cones approaching harvest in northwest Michigan. *Photo by Erin Lizotte, MSU Extension*

Given the findings at OSU, a late harvest timing appears ideal at first, however harvesting hops cones late can actually reduce aroma and shorten the storage life of the hops if stored in bales. When harvested too late, accelerated oxidation and loss of volatile aroma compounds can occur in storage; these problems can be exacerbated by pest damage to the cones. This knowledge must be balanced with the previously mentioned findings that essential oil content increases in hop cones harvested later. Conversely, harvesting cones too early reduces yield and flavor and can reduce vigor and yield in subsequent seasons due to a disruption in the natural reallocation of carbohydrates to the root system late in the season.




Cross section of a hop cone showing the location of the lupulin gland. *Photo by Wikimedia Commons.*

In the major hop growing regions, harvest is generally targeted when cones reach an average of 23 percent dry matter. The Oregon Hop Commission provides some limited varietal recommendations for specific dry matter targets available online at http://www.oregonhops.org/culture3.html. Growers can expect dry matter content to increase by 1 percent every four to seven days, depending on variety and environment.

The University of Vermont Extension provided the following protocol to determine the percentage of dry matter. Begin by randomly sampling 5 to 10 sidearms of the same variety from throughout the hopyard. Samples should be taken from near the top of the trellis, approximately 2 feet below the trellis wire. The sample should reflect the state of your yard and should be taken when there isn't excess moisture in the hopyard, i.e., after the morning dew has dried, when it isn't raining, etc. Pick the cones off of the sidearm into a bucket and mix thoroughly before selecting a subsample of 100 to 150 cones. Once you have your subsample, you can begin the determination of dry matter.

Weigh an empty container in grams. Weigh the freshly picked hops in the container and record both weights. Dry the hops down to 0 percent moisture. This can be done one of several ways:

1. Overnight in a food dehydrator at 140-150 degrees Fahrenheit.
2. In a Koster Moisture Tester, commonly used to test forage moisture.
3. In a microwave or oven, being sure to remove the sample every minute or less to prevent scorching. Samples dried in a microwave oven must be watched very closely, every 30-45 seconds, and dried at around 50 percent power to prevent heat buildup in the microwave oven that can damage it.

Using a food dehydrator will allow the cones to dry to 0 percent moisture overnight. However, the Koster tester and microwave methods require constant monitoring as they will dry the cones relatively quickly. Once the sample

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***Hops Harvest in Full Swing, continued from previous page***

has reached a stable weight, the hops are at 0 percent moisture. Weigh the dry hops and record the weight in grams.

To calculate the percent dry matter, use this equation:

Percent dry matter = 100 x (Dry cone weight – container)/(Green cone weight – container)

Some additional wisdom from the field suggests that cones approaching maturity become light green to yellowish and take on a dry, papery feel. The lupulin gland (see diagram) will turn from a pale yellow to a dark yellow-orange hue. When crushed in the hand, mature cones may crumble and do not rebound. Cones should not be completely brown at harvest.

For information on how to calculate alpha acid levels of hops before harvesting go to: http://msue.anr.msu.edu/news/how_to_calculate_alpha_acid_levels_of_hops_before_harvesting

## Bacterial Soft Rots of Pumpkins, Winter Squash

Bacterial soft rots are a perennial issue in many vegetable crops. Generally soft rots are pretty easy to spot and cull during harvest, though early infections can me missed, leading to a runny mess in your bins.

There seems to be a fair amount of bacterial infection in some fields this year, possibly due to increased wounding by everything from crows and cucumber beetles to hail and wireworms. In some cases it appears that infection happened quite awhile ago, and has been slowly progressing. In a field I visited yesterday some pumpkins visually appeared sound, with just small chew marks that had long ago healed. However, the ground spots were a little soft and the stems came off easily. When those fruit were cracked open the bacterial infection was apparent. Near the old feeding injuries there was internal deterioration, and the bottom of the pumpkin was quickly becoming a gooey mess inside (lower image). It is more common to be able to see external symptoms, however. The top image is typical of pumpkins infected with bacterial rot in this field. Pathogens were coming in through wireworm feeding and cucumber larvae feeding where fruit contacted the ground. Sticky fluid filled with bacteria was oozing from the holes.

If you are seeing bacterial infections in the field, check each fruit carefully as you bring it out of the field. Any fruit with signs of bacterial infection should be left in the field, since it can infect healthy fruit as it leaks in the bin. When cleaning fruit, either using running water or dry cleaning will limit spread of bacteria, whereas tub washing can spread bacteria from fruit to fruit.

There is no treatment for existing bacterial soft rot infections. The best way to limit future infection is to limit fruit injury, since bacteria enter through wounds. *–CLS*

Fruit oozing bacteria from wounds in the ground spot (top), and cracked open pumpkin filled with bacterial rot (bottom.) *Images: CLS*

## Visit the ENYCHP Website

For online class registrations, announcements, previous issues of our newsletters, and more, visit the ENYCHP website at http://enych.cce.cornell.edu/. Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!

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| S. Clinton | 0 | 0 | 0 | 11 | 0 |
| Columbia | 0 | 1 | 33 | 5 | 0 |
| Fulton | 0 | 0 | 0 | 0 | 1 |
| Orange | 0 | 0 | 1 | 2 | 0 |
| Saratoga | 0 | 0 | N/A | N/A | 1 |
| Schoharie | 0 | 0 | 2 | 0 | 0 |
| C. Ulster | 0 | 0 | 16 | 87 | 0 |
| N. Ulster | 4 | 0 | 100 | N/A | N/A |
| C. Washington | 0 | 0 | 0 | 0 | 0 |
| N. Washington | 0 | 0 | 0 | 4 | 0 |

**0./2 U c fc R c** This chart is compiled using the data collected by Northeast Weather Association (NEWA) weather stations. For more information on NEWA and a list of sites, visit http://newa.cornell.edu/ This site has information not only on weather, but insect and disease forecasting tools that are free to use.

## 2014 Weekly and Seasonal Weather Information

| | E m gl e Bce cc Gl dm k gml c 3. M D | | | P gl d aa k gml | | |
|---|---|---|---|---|---|---|
| g c | 0./2 U cci Rm 9/1 - 9/7 | 0./2 c ml Rm 3/1 - 9/7 | 0./1 c ml Rm 3/1 - 9/7 | 0./2 U cci P gl d 9/1 - 9/7 (inches) | 0./2 c ml P gl d 3/1 - 9/7 (inches) | 0./1 Rm P gl d 3/1 - 9/7 (inches) |
| l | /50 0 | 0206. | 02.4. | . /5 | 0. 34 | 05 02 |
| A c ml | /4/ / | 0071 6 | 0161 5 | / 02 | 00 22 | 03 23 |
| Agl ml N i | /34 / | 00./ 4 | 0043 0 | . 1/ | 00 32 | 06 40 |
| Agl ml b c | /52 4 | 0234 1 | 034. 4 | . 21 | 01 7. | 07 27 |
| E cl D | /27 5 | 0/46 5 | 0. 62 3 | . 34 | 00 /0 | 01 47 |
| E gbc l b | /36. | 00/6 3 | 0067. | L- | L- | L- |
| Fgef l b | /5. / | 022/ 1 | 031/. | . 35 | 01 74 | 06 35 |
| F b ml | /51 1 | 0226 5 | 03/1. | . 3/ | 02.4 | 0/ 35 |
| mm | /41 3 | 0124 5 | 023/ 3 | . 0. | 03.1 | 06 7/ |
| ml emk c | /42 6 | 0160 1 | 0201. | . . / | /7 6. | 06 15 |
| ml gac m | /13. | /65/ 2 | /716 3 | L- | L- | L- |
| Nc | /23 7 | 0. 54 7 | 0/07 0 | . 1. | /6 70 | 0/ 32 |
| fmcf k TR | /32 3 | 0/60 2 | 004/ 6 | / /. | /7 33 | 03 61 |
| U g mm | /11 3 | 0..0. | 0. 57 0 | L- | L- | L- |