UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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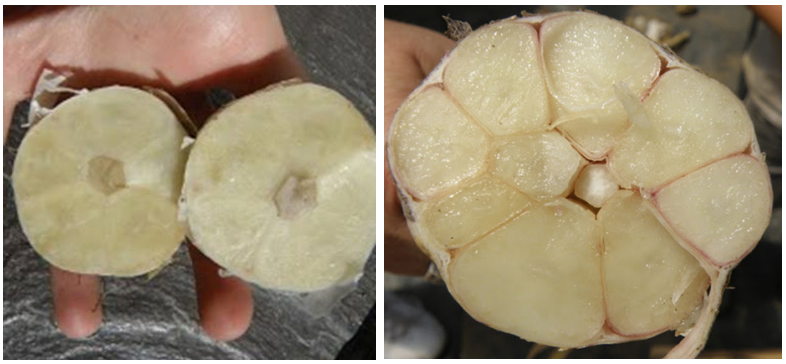
In this issue:

This cabbage field, planted 3 days before the May freeze, has abnormal, strap-like leaves and multiple growing points, resulting from freeze damage to the growing point. Let us know what crops you lost in the May freeze—see the survey link at the end of Crop Conditions. Photo: S. B. Scheufele

Crop conditions

It's been a wet few weeks—most of the state has gotten several inches of rain over the last 2 weeks, and central MA getting close to 7" in that period. Soils and crops are wet, meaning there's mud and diseases to contend with. And it's hot! We've certainly had hotter individual days in MA in the past, but Tuesday and Wednesday were recorded as the hottest global temperatures since 1979 (when the US National Centers for Environmental Protection began keeping data). Ice core and tree ring data indicate that it may have been the hottest global average in 125,000 years—a result of rising global temperatures combined with this year's El Niño weather pattern. We can anticipate more broken records in the months and years to come.

A true sign of summer plowing on, garlic is almost ready to harvest. Wondering if your garlic is ready to harvest or still growing? Crystal Stewart-Courtens from Cornell Cooperative Extension recommends looking at how the cloves fill their wrappers as an indication of maturity. Cut through a few heads sideways (around the equator, so you cut each clove in half). Mature cloves will fill the wrappers and cloves that are a little loose should be left to continue growing (see photo below). Wait too long and bulbs will start to pop open—this can happen quickly in wet weather. And it's better to harvest a bit early than a bit late and be stuck with popped bulbs.



Left: Garlic that is not quite ready. Right: Garlic that is ready for harvest. Photos: C. Stewart-Courtens, CCE ENY Commercial Horticulture Program

Now that we're mid-heatwave, it's hard to remember that a month and a half ago we had a major freeze event. The impacts of the freeze were quickly evident on crops like apples and strawberries which were in flower at the time, but it takes a long time to see the damage manifest in vegetable crops, and growers may just be starting to see the impacts of that freeze now. For veggies, corn was likely hardest hit, but many other crops could have been set back considerably, and others, like in the cabbage

Contact Us:

Contact the UMass Extension Vegetable Program with your farm-related questions, any time of the year. We always do our best to respond to all inquiries. **Office phone:** (413) 577-3976 **Email:** umassveg@umass.edu

Home Gardeners: Please contact the UMass GreenInfo Help Line with home gardening and homesteading questions, at greeninfo@umext.umass.edu.

pictured left, had damage to the growing point that is only now becoming evident and this crop may not produce a marketable head. For this reason, MDAR, UMass Extension and a number of other service providers are now releasing a survey to gather information about crop losses both in May and from the sudden temperature dip back in February. You may have already reported losses to your insurer, FSA agent, or another ag service provider, but please fill out this survey as well. Compiled information will be used to help MDAR determine whether state-level emergency funds are warranted.

Access the survey here: https://umassamherst.co1.qualtrics.com/jfe/form/SV_b2BKrQXOUpV8aNg

Pest Alerts

Beans

Mexican bean beetle larvae are active now. MBB adults and larvae feed on bean foliage and can cause significant defoliation. MBB can be controlled using parasitic wasp *Pediobius faveolatus* that lays its eggs in MBB larvae. The ideal time for releasing *Pediobius* is when MBB eggs just begin to hatch, but releasing the parasitoid now could still be helpful if you have several successions of beans planted. See the article in last week's issue for more information.

Mexican bean beetle adult (left) and larvae (right).

Brassicas

Abiotic issues like buttoning broccoli and damage from the May 18 freeze are becoming apparent now that crops are heading up. We may also begin to see effects from the heat—see the article this issue for more on heat-related issues in brassicas.

Caterpillar damage is increasing in untreated fields. In MA we are seeing imported cabbageworm and diamondback moth larvae present now and actively feeding (and pooping) on brassica crops.

Diamondback moth larva

Cucurbits

Bacterial wilt symptoms are being seen now in the most susceptible crops (cucumbers and muskmelons). Bacterial wilt is vectored by striped cucumber beetles. There is no management strategy for bacterial wilt other than controlling striped cucumber beetle. See the June 1, 2023 issue of Veg Notes for information on striped cucumber beetle.

Cucurbit downy mildew has not been reported in any new locations so far this week. Growers should continue applying a preventative fungicide regularly to cucumber and cantaloupes. An ideal cucurbit spray program would currently include a preventative for cucurbit

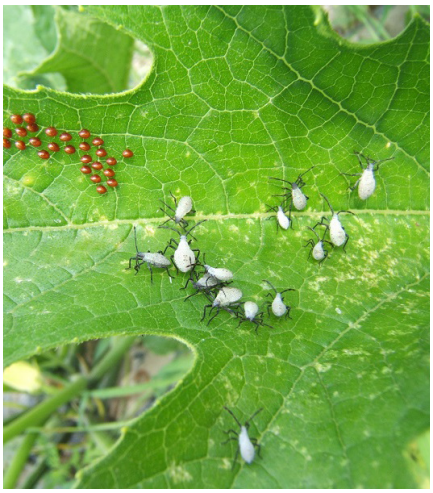
Bacterial wilt in squash

and powdery mildews and 2 rotated targeted powdery mildew materials (see below).

Cucurbit powdery mildew is developing now—a result of the hot, wet weather. Before PM develops in your crop, apply a broad-spectrum, preventative fungicide regularly. Chlorothalonil (e.g. Quadris) and copper (OMRI-listed options available) are effective as preventative materials against powdery and downy mildews. Sulfur and oils are effective against powdery mildew only. If PM is starting to develop in your crop, add a targeted PM material and rotate between fungicide classes with each spray. Targeted materials include Vivando (Group 50), Inspire Super (3 + 9), Luna Experience (7 + 3), Rhyme (3), Rally (3), Procure (3), Trionic (3), and Gatten (U13). Quintec, Torino, Endura, and Group 11 fungicides are not recommended. For more information on managing both powdery and downy mildews in cucurbits, see the article in the June 22, 2023 issue of Veg Notes.

Cucurbit powdery mildew

Squash bug: Eggs were observed last week and nymphs are starting to emerge now. Squash bug adults and nymphs feed on cucurbit foliage with piercing-sucking mouthparts. Their feeding reduces yield and they also inject a toxin when they feed, eventually causing "anasa wilt" which causes defoliation and reduces yield and quality. In young plants, treat at 2 adults/plant for watermelon, muskmelons, cucumber, and butternut, or 1 adult/plant for other cucurbits. In flowering plants, the spray threshold is 1 egg mass per plant, timed for when nymphs just hatch. See the New England Vegetable Management Guide for labeled materials.



Squash bug nymphs and eggs

Squash vine borer trap counts remain high for the 2nd week in most locations—see Table 1. When larvae bore into thick-stemmed cucurbit plants to feed we see vines or whole plants collapse quickly without discoloration. We expect to start seeing this damage soon. When significant moth flight is detected (5 moths/week in bush-type cucurbits and 12 moths/week in vining-type cucurbits), a pesticide spray is recommended. Conventional materials include Assail or pyrethroids (e.g. Brigade, Asana, Warrior, Pounce). Make 2-3 applications, 5-7 days apart. Organic growers can use spinosad (e.g. Entrust) and/or Bt (e.g. Dipel). Direct sprays to the base of plants where the eggs are laid in order to reach emerging larvae before they burrow into stems.

Table 1. Squash vine borer trap captures for week ending July 5

Whately	1
Leominster	0
North Easton	35
Sharon	20
Southampton	10

Nightshades

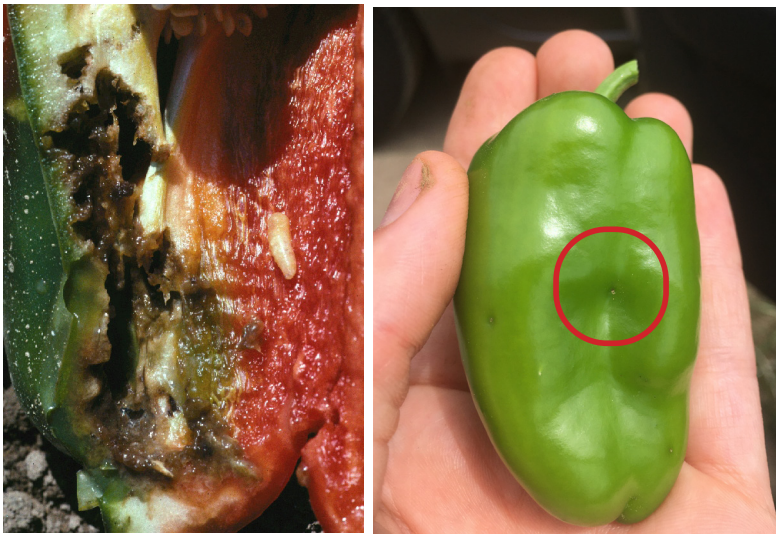
Abiotic disorders are being reported in high tunnel tomatoes, including green shoulder, uneven ripening, leaf curl, and blossom end rot. These disorders are caused by a variety of factors including inadequate potassium or calcium, uneven watering, and environmental conditions like especially cool or hot temperatures, wide temperature fluctuations. Some varieties are more susceptible than others to some of these disorders. During this hot week, vent tunnels as much as possible, put your shade cloth up if it isn't up already, and make sure you're giving plants enough water. See the article in the June 15, 2023 issue of Veg Notes for more information.

Three-lined potato beetle larvae are feeding now. They will cause minor damage in potato and tomato but can cause a lot of feeding damage in tomatillo. The larvae look similar to those of Colorado potato beetle and are easily identifiable by their practice of carrying their poop around on their back, to deter predators. Adults are elongate, yellow beetles with 3 black stripes, and look like striped cucumber beetle.

Colorado potato beetle adults, eggs, and small and large larvae are all present now in untreated potato and eggplant crops. We saw a great video this week of one farm knocking CPB into buckets using tennis rackets—it looked much faster than hand-picking! (One tip they had was to mount the bucket onto a stick to avoid the need to bend over).) Pesticides are most effective if sprays target small larvae. CPB develops resistance very easily: if you apply a pesticide to this generation of CPB, *do not* apply the same class of insecticide to the next generation. See the article in the June 22,

2023 issue of Veg Notes for more details.

Pepper maggot flight is likely to start this week or next in MA. If your farm struggles with this pest, now is a good time to cover susceptible crops with insect netting, and to start monitoring for activity to prevent egg laying and crop damage. Monitor by placing yellow sticky cards in a susceptible host (cherry or bell peppers) and/or by checking for ovisposition scars or "stings". An insecticide is recommended in uncovered crops as soon as flies are captured in sticky traps or stings are observed—make two insecticide applications, 10-14 days apart, with a material labeled for pepper maggot.



Pepper maggot within a pepper plant (left, Photo: J. Boucher), and an oviposition mark (right, Photo: G. Higgins).

Sweet Corn

European corn borer continues to be caught in low numbers at some locations, but the first flight is largely over. There is a second flight beginning mid-July (1400 GDDs). If corn earworm trap captures are below 1.4/week, scout corn for caterpillars and spray if 15% of plants are infested. Our Sweet Corn Scouting Guide includes a process for scouting.

Corn earworm trap captures are up in most locations this week, indicating that moths have been blown up from the South on this week's storms. Most locations are on a 4-day spray schedule for silking corn. Do not rely on synthetic pyrethroids (IRAC Group 3A, e.g. Fastac, Baythroid, Delta Gold, Asana, Declare, Warrior, Pounce) alone to control CEW.

Corn earworm. Photo: R. Hazzard

Table 3. Corn earworm spray intervals based on Heliothis trap moth captures

Moths per night	Moths per week	Spray interval
0 - 0.2	0 - 1.4	no spray
0.2 - 0.5	1.4 - 3.5	6 days
0.5 - 1	3.5 - 7	5 days
1 - 13	7 - 91	4 days
Over 13	Over 91	3 days

Table 2. Sweetcorn pest trap captures for week ending July 5

Location	GDD* (base 50°F)	ECB NY	ECB IA	FAW	CEW	CEW Spray Interval
Western MA						
Feeding Hills	995	0	0	0	6	5 days
Southwick		1	0	0	1	no spray
Granby	923	1	0	0	2	6 days
Whately	992	0	0	-	5	5 days
Central MA						
Leominster	999	1	1	0	51	4 days
Lancaster		1	0	0	8	4 days
North Grafton	833	0	0	0	22	4 days
Spencer	915	2	0	0	38	4 days
Eastern MA						
Bolton	913	0	0	-	-	-
Concord	881	0	0	0	1	no spray
Haverhill	913	4	0	0	7	4 days
Ipswich	830	2	0	0	5	5 days
Millis	-	4	1	-	13	4 days
North Easton	930	0	0	0	32	4 days
Sharon		0	0	n/a	12	4 days
Sherborn	923	0	0	0	6	5 days
Seekonk	870	1	0	0	41	4 days
Swansea		0	0	-	-	-

- no numbers reported for this trap
N/A this site does not trap for this pest

*GDDs are reported from the nearest weather station to the trapping site

Miscellaneous/Multiple Crops

Potato leafhopper numbers are increasing and nymphs are likely present now. Nymphs are bright green, wedge-shaped, and move sideways, crab-like, on the undersides of leaves and they indicate an established population. Get them now before you see signs of damage, then it will be too late.

Potato leafhopper nymph (left) and adult (right).
Photo: Michigan State University

Pea powdery mildew was very severe in one field in Hampshire Co. this week, caused by the humid conditions. This disease is not severe every year. Severe infections will spread to the pods and cause black discoloration. There are resistant varieties available—some are listed here.

Pea powdery mildew.
Photo: G. Higgins

Some Heat-Related Disorders in Brassicas

Brassica crops like cool temperatures and struggle in the heat. There are several heat-related disorders of brassicas that can be hard to avoid when growing these crops through the hottest part of the summer. For this reason, many growers limit most of their brassica production to early summer and fall. If you can manage to grow high quality broccoli or cauliflower through the heat of the summer, it is often well worth it; prices for these crops can spike when supply is low, and having fields to harvest year-round will give you the opportunity to capture a good price. This article includes descriptions of a few heat-related disorders that you might see in your brassica crops and some strategies for avoiding them.

First some background information: Plants take up nutrients through their roots. Some nutrients, including calcium (Ca), are then passively transported throughout the plant via the plant's water-conducting vessels (xylem). Water is pulled up through the plant during transpiration—the process of water evaporating out of stomata in the plant's leaves. If water is not moving through a plant, due to root injury, high heat or cloudy weather causing stomata to close, or dry soils, the plant's ability to take up and translocate nutrients is reduced. Even if soil nutrient levels are sufficient, heat or moisture stress can inhibit a plant's ability to take up those nutrients. This is how heat and moisture stress can lead to brassica disorders like head rot, brown beading, and tip burn, which are all caused by Ca deficiencies, or hollow stem, which is caused by boron (B) deficiency.

Head Rot and Brown Beading in Broccoli

Head rot and brown beading are both results of flower buds aborting due to Ca deficiency. Head rot results when bacteria invade aborted buds under wet conditions, while brown beading results from individual flower buds aborting under dry conditions. Excess nitrogen and extended periods of wet or dry conditions during warm temperatures give rise to rapid plant growth.Calcium uptake is diminished due to poor transpiration rates in the plants.

Brown beading (left) and head rot (right).

Research done by Thomas Bjorkman at Cornell University, using the cultivar 'Galaxy', showed that the critical period for heat sensitivity in broccoli only lasts for roughly ten days. This 'window' of sensitivity corresponds to the time when the growing tip shifts from vegetative growth to flower bud initiation. This period of about 10 days begins just before a tiny crown is visible in the center of the plant. Temperatures above 36°C (85°F) for more than four days during that period causes uneven bud development, resulting in heads that are uneven and poorly shaped, and leading to head rot and brown beading. Other extension resources put the upper limit for growing high quality broccoli at about 85°F.

One way to avoid head rot and brown beading in broccoli is to grow several varieties that mature at slightly different times. This way, if your broccoli experiences high heat, you're likely to have some varieties that are not within their window of sensitivity during the heat wave, and you will not experience a total crop loss.

Tip burn

Tip burn on cabbage. Photos: G. Higgins, J. Howell

Tip burn is the result of Ca deficiency in brassica leaves. Margins of inner leaves turn brown, beginning at the hydathodes (structures in the leaf tip or margin that excrete excess water), and later desiccate to become thin and papery at the margin or over large portions of the leaf. The affected tissue may turn dark brown to black, occasionally being invaded by secondary bacteria that cause a watery soft rot. In cauliflower, internal leaves turn brown and fold over the developing curds. When secondary microorganisms attack these leaves, they become a mushy smear over the curd and make the head unmarketable. During the day, Ca moves with the transpiration stream to the outside leafy parts of the plant, which are actively transpiring on sunny days. On cool nights, transpiration is reduced and water movement generated by the roots is directed to the inner part of the plant and those tissues are supplied with Ca. However, on warm, dry nights, the outer leaves continue to transpire and Ca continues to be sent to the outer leaves. Once Ca is fixed by the outer leaves, it cannot be translocated to the interior of the plant, resulting in Ca deficiencies in the center of the plant.

Hollow Stem

Hollow stem occurs in both heading and root brassica crops and is often not noticeable until harvest. Broccoli, cabbage, cauliflower, turnip, and rutabaga are especially sensitive to hollow stem development. This disorder can be caused by boron (B) deficiency and can be exacerbated by heat, rapid growing conditions, and soil pH above 7. Chlorotic younger leaves or rosette die-back can be a sign of B deficiency and hollow stem. Excess moisture leaches B out of the soil, while low moisture inhibits soluble B uptake and causes poor root development. Excess Ca, K, or Zn have also been shown to outcompete B in plant uptake. Other causes include excess nitrogen fertilizer, imbalance of nitrogen and boron, or rapid growth after head initiation. High P levels in soil have been shown to increase B uptake. There are cultivar differences in B sensitivity.

Boron deficiency in cauliflower. Photo: J. Howell

Management:

- Provide **even and adequate soil moisture**.
- Limit head rot in broccoli by **using drip irrigation** instead of overhead to limit the amount of water that sits on heads.

- **Variety selection**: Choose heat tolerant varieties and varieties resistant to tip burn and hollow stem. Varieties that grow less vigorously are less susceptible to tip burn. These characteristics are usually included in variety descriptions in seed catalogs. The Eastern Broccoli project is a collaboration of several universities, government agencies, and private companies researching ways to increase broccoli production on the East Coast—see the project's website for a list of varieties that have performed well for late summer harvest.

Nutrient management:

- Avoid excess fertility. Excess nutrients, especially N, can promote rapid plant growth; tissues that cannot take up nutrients quickly enough will display deficiencies.
- Maintain a phosphorous to potassium ratio of 1:1.
- Avoid using urea, ammonium nitrate, or calcium ammonium nitrate fertilizer. Both ammonium and Ca are 2+ cations and ammonium will out-compete Ca for uptake in the plant. Calcium nitrate is more expensive but the N is all in nitrate anion form, which will not compete with Ca for uptake. Use greenhouse grade calcium nitrate if applying through drip to avoid clogging lines.
- It is not necessary to apply supplemental Ca when soil levels are already sufficient.
- Avoid sidedressing brassica crops after head development begins.
- If soil tests show that soil boron levels are below 3ppm, apply 3 lbs/A boron for broccoli and cauliflower or 2lbs/A for cabbage, prior to planting. The best method for applying this small amount of boron is as a fertilizer additive or as a diluted spray.
- Harvest crops when mature; do not try to hold crops in the field if they are starting to show signs of these disorders.
- Avoid aggressive cultivation that could harm roots, which limits water and nutrient uptake.

-- UMass Vegetable Program, updated 2023

PRELIMINARY RESULTS FROM GARLIC ERIOPHYID MITE CONTROL STUDY SHOW PROMISE

--Written by Crystal Stewart Courtens, Vegetable Specialist, CCE ENYCHP

Eriophyid mite incidence in garlic has increased in the last 5 years. These microscopic mites can cause stunted, twisted growth early in the season and may contribute to garlic rotting in the field over winter. Garlic that grows well tends to have low mite populations and growth outpaces the damage for most of the season. The low numbers that persist on garlic until harvest may explode during storage, however, leading to significant losses of bulbs.

Infested garlic is shriveled, yellowing, and may have a sparkly or powdery coating. Photo: F. Hay

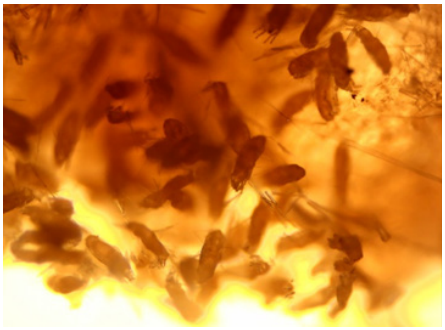
Detecting Eriophyid Mites:

Inspecting the inside of wrapper leaves and clove surface with a compound microscope can reveal mites feeding on the garlic. Make sure you examine garlic carefully in storage, and check varieties with looser (easier to peel) wrapper leaves first, as they are preferred hosts. Infested cloves may shrivel and turn yellowish and soft.

Cold storage for non-seed garlic

If mites are detected in garlic which is being kept for consumption rather than planting, the best method to stop population increase is to store the garlic cold. Maximum mite population growth occurs at 77°Fand 80-95% RH. This temperature would be considered fine for most other storage considerations but if you have a mite issue, storage as usual will not work. Eriophyid mite reproduction slows as the temperature drops and stops at 43°F. Hence, a moderate infestation could be held static by storing garlic at 43°F or lower. If you store cool to cold, remember that the garlic is being vernalized, and will sprout if brought to warmer temperatures. Keep it cold until it is being sold or distributed.

Two primary research-based strategies have emerged to combat mites in storage of seed garlic: high-heat drying and deployment of predatory mites in storage.



Mites on wrapper leaf examined at 40x magnification.
Photo: C. Stewart-Courtens

High Heat Drying Technique

Heating garlic to between 113°F and 119°F for just one hour during the drying process kills mite eggs. This process should be done with great attention to prevent bulbs reaching an internal temperature of 120°F, at which point waxy breakdown occurs. In preliminary work with Chris Callahan from UVM, we realized that the surface of garlic bulbs remains cooler than the air temperature until the garlic is nearly dry due to evaporative cooling. Because of this, bringing garlic to a high temperature once it is completely dry is the best option to actually reach the correct temperature.

Beneficial Predatory Mites

Eriophyid mites can move into the space between cloves in addition to being on the outer-facing surface, which makes the heat exposure method useful but not foolproof. In order to control mites that survive in these protected spaces and emerge during storage, we added the extra control measure of releasing *Stratiolaelaps scimitus* predatory mites during storage.

Our initial results vary from farm to farm, but the applications did reduce Eriophyid mite severity on average. After this initial work we recommend *S. scimitus* applications as one tool in the toolbox, with the understanding that biocontrols can be positively and negatively affected by a variety of factors that can cause variable control. If you are interested in trying this approach, *S. scimitus* mites can be purchased from Applied Bio-nomics distributors.

There is still work to be done before we really have Eriophyid mites under control in garlic. Careful monitoring and a multi-pronged control approach is the best recommendation at this time.

FUNGAL FOLIAR DISEASES OF ONION

Onions are sizing up and it's time to start looking for signs of foliar diseases in onions. Recent weather is particularly conducive to spore production, with high humidity, frequent rains, and warms nights. This article gives an overview of the three most common foliar fungal diseases of onion in Massachusetts–Botrytis leaf blight, purple blotch, and downy mildew. We also included a (for now) less common disease—Stemphylium leaf spot. These diseases are similar in that they are favored by warm, humid temperatures, they overwinter in crop residues and cull piles, and their spores are spread by wind and splashing water. Although these diseases occur on onion leaves, they can indirectly affect yields by reducing bulb sizes and directly lead to losses by causing bulb rots in storage. If you plan on using fungicides to control these diseases, catching the diseases early is crucial. If you don't plan on spraying, identifying infected vs. clean varieties or fields can help you decide what to sell quickly and what to store through the winter.

Botrytis leaf blight (*Botrytis squamosa*) causes small, white lesions, 1-5 mm long, surrounded by green-white halos. As the disease progresses, lesions become sunken and tan and may split down the middle. Symptoms often begin in older leaves. Botrytis overwinters in onion cull piles, on crop debris, or as sclerotia (small, dense masses of fungal tissue with a dark rind) in the soil. In the spring, sclerotia produce spores that are spread by wind and cause infection in onion crops if foliage is wet for long enough and temperatures are warm. Botrytis, along with downy mildew, does not like hot weather – the pathogen thrives in cool to warm temperatures and shuts down when it gets too hot. Severely affected fields will appear blighted with most leaves dead and desiccated. Losses in yield occur because of smaller bulb size resulting from premature leaf senescence. The *Botrytis* that causes leaf blight in onion is a different pathogen than the one that causes botrytis neck rot in alliums and gray mold in many crops.

Botrytis leaf blight.
Photo: C. Hoepting

Downy mildew (*Pernospora destructor*) causes 1-2-inch long, pale-green, oval-to-round spots that expand and coalesce, girdling leaves and causing

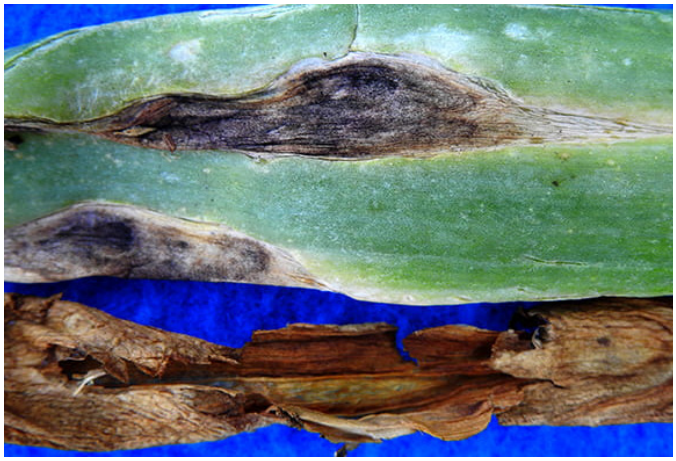
them to collapse. As the pathogen progresses, it produces fuzzy gray sporulation that becomes purple. Spores are produced at night and disseminated by wind the following day. Symptoms are first seen on older leaves when dew is present. Downy mildew and purple blotch often occur together. Similar to purple blotch and Botrytis leaf blight, downy mildew infection can limit bulb growth and cause bulb rots. Infection occurs when leaves are wet and usually when temperatures are below 75°F. Like Botrytis and purple blotch, downy mildew shuts down at high temperatures. The pathogen survives the winter in fall-planted overwintering onions or volunteer onion plants as oospores (thick-walled survival spores), or as mycelium in stored bulbs, seed, or crop residue. Infected bulbs become soft and shriveled, some sprouting prematurely. The pathogen directly infects roots of new plants in the spring, which become systemically infected and produce spores that spread to other plantings. Downy mildew of onion affects only alliums and is a different pathogen than the downy mildews of cucurbits, basil, and spinach.

Downy mildew on onion.
Photo: H.F. Schwartz, Colorado State Univ., Bugwood.org

Purple blotch (*Alternaria porri*) causes boat-shaped lesions (i.e., a birds-eye-view of a canoe) with distinctive purple-brown sporulation. Lesions are initially water-soaked with white centers; as the pathogen expands within the leaf, the lesion may develop concentric rings. Leaves with large spots turn yellow and blow over in wind. Purple blotch and Stemphylium (described below) both continue to infect at high temperatures (into the 90s), making them the prominent mid-summer diseases of onion where present. Almost no infection occurs below 55°F. Like other species of *Alternaria*, the purple blotch pathogen overwinters in infected crop debris and can be carried on seed. Spores are produced when temperatures are warm (optimum temperatures are 77 to 81°F) and humidity is high, and are spread by wind and splashing rain or irrigation water. Older leaves and leaves with heavy thrips damage are most susceptible, as purple blotch can easily infect dead leaf tissue and move from there to healthy tissue. Bulbs may become infected at harvest through the neck or wounds; bulb decay shows first as a watery rot around the neck causing yellowish to wine-red discoloration. As it moves through the scales, tissue dries to a papery texture.


Purple blotch. Photo: G. Higgins

Stemphylium leaf spot (*Stemphylium vesicarium*) is a major disease of onions in the large-scale onion producing areas of NY state but is not common in areas where onion production is on a smaller scale. Initially in reports from NY, *Stemphylium* was found only infecting dead onion leaf tissue, but over time it was found infecting healthy tissue as well. It commonly infects plants following infection by another disease, first infecting the dead tissue and then moving to healthy tissue. Spots are water-soaked and light-yellow to brown. They elongate and can coalesce into large lesions and develop concentric rings. Spots can be purple and produce dark brown sporulation – they are virtually impossible to distinguish from purple blotch spots without using microscopy. In areas where Stemphylium leaf spot is widespread, populations of the pathogen has shown decreased sensitivity to fungicides in FRAC groups 7, 9, and


Stemphylium leaf spot. Photo: M. McGrath

11 fungicides and signs of resistance development to group 3 are starting to appear . Cornell Extension produced a cheat sheet for 2022 on the relative efficacy of various fungicides for control of Botrytis and Stemphylium leaf blights in NY, based on research trials. The species of *Stemphylium* that causes leaf spot on onions is a different species than the one that infects spinach.

Disease forecasting models are available for Botrytis leaf blight, purple blotch, and downy mildew, through the Network for Environment and Weather Applications (NEWA). The models use crop maturity stages and environmental data to forecast if conditions are favorable for disease development in order to inform fungicide spray decisions. The models are designed to be used in combination with regular crop scouting, because the models do not consider whether or not any of the pathogens are present in your crop already—if conditions are favorable for disease development but disease has not started in your crop, a spray is not warranted. The NEWA page provides detailed information about each model, but generally explains that to make an informed pesticide decision, you need to ask yourself these questions about the past and forecasted environmental conditions and the presence of disease in your field:

If the disease is present [in your field]:

- *How favorable were the conditions for the past 7 days?*
  - If extremely or moderately favorable, choose a fungicide effective against that disease.
- *How favorable are current and forecast conditions?*
  - If the disease is forecast to be over threshold for more than three days, be sure fungicide coverage is maintained.
  - If the disease is not forecast to be over threshold, you may be able to delay fungicide applications. Do not extend spray intervals for more than 10 days and continue to monitor forecasts. Be sure to apply a fungicide before very favorable weather occurs .

If the disease is not present, but conditions have been favorable, scout carefully to determine if the disease has appeared in your field. As new diseases are detected, adjust fungicide programs to include products that are effective against the mix of diseases that are present.

Management practices are similar for all four of these foliar fungal pathogens.

- Destroy cull piles, where the pathogens can overwinter on residues and volunteer plants.
- Practice a 3-year crop rotation out of alliums.
- Till under crop residues promptly after harvest and bury residues deeply.
- Use drip irrigation where possible. If using overhead irrigation, irrigate in the morning on sunny days to minimize the amount of time that foliage is wet.
- Control weeds to maximize air circulation and reduce leaf wetness times.
- Provide proper nutrients. Over-application of nitrogen can cause plants to produce unnecessarily lush foliage, increasing humidity in the canopy. Senescent leaves due to nutrient deficiencies will be more susceptible to pathogens.
- Control onion thrips, as feeding damage can make plants more susceptible to disease. Scout crops beginning in early May and treat at a threshold of 1-3 thrips/leaf (organic growers should use the lower threshold). Cornell has developed spray program recommendations for thrips control in onions for both organic and conventional growers. For the most recent recommendations, see the article in the June 25, 2020 issue of Vegetable Notes for organic materials and the article in the June 15, 2023 issue that includes conventional products. For all labeled products, see the onions, scallions, and shallots insect control section of the New England Vegetable Management Guide.
- Chemical control: Lists of labeled products for all four of these diseases are available in the New England Vegetable Management Guide. Cornell Cooperative Extension also provides in-depth fungicide program recommendations, but resistance to certain FRAC groups may be more widespread in NY than in other states because onions are grown on a much larger scale in NY than in other states. New 2023 recommendations for Botrytis leaf blight, Stemphylium leaf spot, and downy mildew are available here.

--Written by G. Higgins

News

New Massachusetts Freeze Event Impacts Survey!

The freeze events of February 3-4 and May 18, 2023, had significant impacts on agricultural sectors including tree fruits, berries, vegetables, ornamentals, and others. Now that losses are evident for most crops, UMass Extension and our partners* hope to generate timely reporting on losses at the state and regional levels. If you produce agricultural crops (including nursery stock) and you experienced crop losses due to the February 3-4 deep freeze and/or the May 18th freeze, please report them by filling out this survey. **SURVEY DEADLINE: July 31.**

This data will help document the extent of crop and economic losses and will inform the public and decision-makers who may be considering actions that would provide emergency funds to Massachusetts producers. Some growers may also receive insurance payments or be eligible for low-interest FSA loans or other USDA disaster programs. However, data from these programs will take many months to report, and may under-report losses in some sectors. Producers should also report losses to their local FSA office as soon as the extent of the damage can be assessed--this survey is not intended to take the place of reporting to FSA.

Your Data and Privacy will be protected. Please see details in the opening page of the survey and on the final page, where you may choose to provide and share contact information if you wish. No crop loss data at the individual farm level will be shared.

*Partners include: USDA Farm Services Agency, USDA Risk Management Agency, MA Department of Agricultural Resources, MA Farm Bureau Federation, MA Food System Collaborative, MA Fruit Growers' Association, New England Vegetable and Berry Growers Association, Community Involved in Sustaining Agriculture (CISA), Southeast MA Agricultural Partnership (SEMAP), and Berkshire Grown.

If you have questions about this survey, please contact cclay@umext.umass.edu.

EPA Seeking Comment on Bilingual Labeling

The EPA Bilingual Labeling Requirements under the Pesticide Registration Improvement Act of 2022 (PRIA 5) require EPA to solicit all stakeholders on the best methods to make bilingual labeling accessible to farmworkers and increase awareness of the program. PRIA 5 amended the Federal Insecticide, Fungicide, and Rodenticide Act, requiring

Spanish language translation for key health and safety sections of the end-use pesticide product labels. Public input that includes environmental justice perspectives with solutions will be key in helping the Agency develop a strong starting point for addressing historical disadvantages for farmworkers.

Comments must be submitted by **August 21, 2023**.

Federal Register Notice on Open Comment Period: https://www.regulations.gov/document/EPA-HQOPP-2023-0270-0003

Bilingual Labeling Docket: https://www.regulations.gov/docket/EPA-HQ-OPP-2023-0270/document

Events

Twilight Meeting: Irrigation Systems and Management at Warner Farm

When: Thursday, July 13, 4:00 pm - 6:00 pm

Where: Warner Farm, 23 South Main Street, Sunderland, MA, United States

Registration: Free! Click here to register.

Warner Farm, a CSA and wholesale farm as well as the home of Mike's Corn Maze, located in Sunderland, MA, has been developing its irrigation capacity since the late 1970s. The farm's rich sandy loam has been growing fruit and vegetable crops for centuries and as a changing climate brings changing precipitation patterns to New England, Warner Farm is poised to respond effectively in times of drought.

Join CISA, the UMass Extension Vegetable Program, and Dave Wissemann of Warner Farm on July 13th at 4:00pm for an up close look at how they are optimizing their water resources and water distribution systems to ensure the sustainable production of crops throughout the season and in the face of increasingly uncertain growing conditions.

The workshop includes a farm walk to see irrigation equipment and set up and a detailed explanation of how the farm's systems are designed and maintained. Following the farm walk, join us for further discussion and some locally produced drinks and snacks.

Twilight Meeting: Sawyer Farm Reduced-Till Perennial Clover Trials

When: Thursday, July 20, 4:00 pm - 6:00 pm

Where: Sawyer Farm, 19 Sawyer Road, Worthington, MA, United States

Registration: Free! Click here to register.

Over the past several seasons, farmers at Sawyer have been experimenting with different ways to plant row crops into perennial white clover and reduce tillage using a series of innovative practices. Join Sawyer Farm's Lincoln Fishman for a close look at transplanter shoe adaptations designed to reduce soil disturbance and weed competition in perennial clover and cash crop production. Berkshire Conservation District will also display their no-till drill seeder, which is available for rentals and can be used for mixed or single species applications from clovers and orchard grass to rye and soybeans.

This in-person workshop will be followed with an on-farm networking opportunity. The workshop will take a close look at the system and the research underway with UMass through a SARE Partnership Grant, and is part of CISA's 2023 Adapt Your Farm to Climate Change Webinar and Workshop Series: On-farm Climate Change Adaptation Case Studies from western Massachusetts.

This event is co-sponsored by CISA and the UMass Extension Vegetable Program.

Twilight Meeting at Parlee Farms

When: Tuesday, August 15

Where: Parlee Farms, 95 Farwell Rd, Tyngsborough, MA 01879

Join UMass Extension to hear about pumpkin varieties grown at Parlee Farms, as well as sweet corn IPM and automated irrigation systems.

South Deerfield Research Farm Field Day

When: Wednesday, August 16

Where: UMass Amherst Crop and Animal Research and Education Farm, 91 River Rd., South Deerfield, MA

Come hear about active research going on at the farm, including Vegetable Program trials on heat mitigation strategies, cucumber and basil downy mildew resistant varieties, sprayer technology, and more! We'll also have a presentation on automated irrigation systems from Toro.

Twilight Meeting at Heart Beets Farm: Sweet potato production and fall pest management

When: Thursday, September 21, 4-6pm

Where: Heart Beets Farm, 181 Bayview Ave, Berkley, MA 02779

Join UMass Extension to hear about sweet potato production at Heart Beets Farm, and to learn timely info about fall pest management.

Eastern MA CRAFT Meeting: Geothermal Water Use and Good Agricultural Practices at Farmer Dave's

When: Saturday, October 21, 4-6pm

Where: Farmer Dave's, Dracut, MA

We will take a tour of their solar and geothermal systems and the reuse of the geothermal water for hoop house irrigation. Lisa McKeag from UMass Extension will share about a project the farm is involved in to assess pre- and post-harvest agricultural water quality for food safety. She'll talk about the results of water samples taken at the farm in 2022-23 and give an update on current food safety regulations related to agricultural water.

THANK YOU TO OUR 2023 SPONSORS!

FARM CREDIT EAST

Vegetable Notes. Genevieve Higgins, Lisa McKeag, Maggie Ng, Susan Scheufele, Hannah Whitehead co-editors. All photos in this publication are credited to the UMass Extension Vegetable Program unless otherwise noted.

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