UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

Volume 29, Number 18 August 10, 2017

In this issue:

Crop conditions

The bounty of summer continues to roll in and harvest lists seem never-ending! Melons are being plucked from the vine, mounds of peppers are being washed, and truckloads of potatoes are being hauled around the Pioneer Valley, directly from the field to storage and sorting facilities. This is the time of year when the farm labor force starts getting tired after a long summer. One grower in eastern MA says she has a bad case of the "f@#%-its". This is a psychological condition which can lead to entire fields being abandoned when there is not enough labor to harvest, crops have gotten swallowed up by weeds, pest problems have reduced marketability, or just from pure exhaustion. While some things may not have gone as planned, this is also a time of year to celebrate the successes!! The same aforementioned farmer grew the best crops of onion and eggplant she ever has this year, despite optimum conditions for foliar diseases in onions and heavy pressure from solonaceous flea beetle and Colorado potato beetle on her farm.

As workforce starts to occur (students taking off early for summer vacation, or just plain burnout), remember to train incoming workers according to the new EPA Worker Protection Standards (WPS) which now requires annual training. Changes to the EPA Worker Protection Standards were published in the February, 2017 issue of Vegetable Notes, and WPS training materials for both handlers and workers are available as videos, flip charts, etc. from companies such as Gempler's and may be accessed directly here: http://www.pesticideresources.org/wps/temp/training/index.html

Pest alerts

Basil

Basil Downy Mildew arrived in Massachusetts later this year than in previous years, and does not seem to be spreading as quickly. Those who have come to expect this disease annually have already been treating their crops with materials such as **cyazofamid** (**Ranman**: 2.75-3.0 fl oz/A, 0 dh, REI 12h, Group 21, registered for field and greenhouse use), **mandipropamid** (**Revus**: 8 fl oz/A, 1 dh, REI 4h, Group 40) and **azoxystrobin** (**Quadris**: 6.0-15.5 fl oz/A, 0dh, REI 4h, Group 11, registered for field use only).

Celery

Anthracnose leaf curl, caused by *Colletoctricum acutatum*, was diagnosed on 'Tango' celery in Middlesex Co., MA and in RI this season. This disease has been found on peppers in years past, and has a broad host range, including pepper, tomato, bean, spinach, strawberry, apple, peach, and blueberry. Symptoms on celery include curled leaves, occasional discoloration of leaf margins, twisted petioles, and lesions on petioles. Leaves remain green but often appear fan-like and curl downward. *C. acutatum* overwin-

Annalisa Flynn(UMass Vegetable Program Assistant and Stockbridge School student) is our scout in eastern MA this summer. Here she is collecting the youngest fully expanded leaf from 15 plants in a high tunnel for a tissue test to try and diagnose a yellow shoulder problem possibly related to K deficiency.

ters in soil, infected plant debris, or infected weeds in several plant families and can be carried from the greenhouse into the field: practice strict sanitation in both areas. A 3- to 4-year crop rotation with non-host plants should be followed. Avoid working the fields when the plants are wet, work in fields with a history of the disease last, and power wash equipment between fields. Research has shown that the strobilurin fungicides (Quadris, Quadris Top, Cabrio, Reason) are most effective.

Leaf curling (above) and petiole lesions (below), caused by celery anthracnose .Photo: L. Rodriguez Salamanca & M. K. Hausbeck

Cucurbits

Powdery mildew is severe in some winter squash fields now. Strobilurins are no longer recommended because resistance is widespread, with the exception of Pristine, which is a combination product. Resistance to the DMI fungicides (Rally, Procure) is also widespread; use Rally or Procure at the high labeled rate only. At this stage, fruit quality can be adversely affected by sunscald due to defoliation, incomplete ripening, reduced storability in winter squash, and poor rind quality or discolored handles in pumpkins. In addition, infection by powdery mildew predisposes plants to other diseases, including black rot/gummy stem blight (*Didymella bryoniae*).

Many generations of **squash bugs** are being seen in Norfolk Co., MA and southern NH. If considering the use of azadirachtin on nymphs for lower toxicity to bees, please note that the material **Azatrol** has a national recall due to contamination. See News section of this issue of Vegetable Notes for more information.

Cucurbit yellow vine decline (CYVD), a bacterial disease vectored by squash bugs, and **Bacterial Wilt**, vectored by cucumber beetle, were diagnosed in CT this week on summer squash and winter squash, respectively. **CYVD** was last diagnosed in MA in 2003. From an article by Jude Bucher in CT: "Squash bugs are most attracted to Hubbard squash, summer squash, pumpkins, watermelons, muskmelons, cucumbers, and butternut squash in decreasing order. Using our existing perimeter trap crop system, with early-planted 'Blue Hubbard' around later planted pumpkins (or other cucurbits), may control four pests (squash bugs & CYVD, cucumber beetles & bacterial wilt) with as few as one border spray. Time the trap crop spray just prior to main crop emergence, and if a second application is needed, at the first true leaf stage of the main crop.... Trap crop plants should be 2-3 weeks older than the main crop to attract the bugs. One researcher said that up to 100% of the bugs will be attracted to the border rows and killed by insecticide applications, and that the technique has almost eliminated CYVD in his region over the past 5 years. This trap crop technique is remarkably similar to the perimeter trap crop system New England growers have been using to control cucumber beetles and bacterial wilt on cucurbit crops."

Squash vine borer threat is mostly over in New England for at least the next 2-4 weeks, after which time a second flight may occur. Overall, very few SVB are being captured in traps now, although one location in Westhampton, MA reported 9 SVB in their trap this past week.

Tomato:

Late blight still has not been diagnosed on potato in MA. The strain from last week's tomato sample in Hampshire Co., MA has been confirmed as the US 23 genotype, which affects tomato and potato. More reports of late blight have continued to come in this week from tomato growers in Franklin and Hampshire Cos., MA but not in eastern MA. This morning, late blight was confirmed on the untreated variety 'Mt. Fresh Plus' and on copper-treated (2 applications in the last 10 days) cherry tomatoes at the UMass Research Farm in South Deerfield, MA. Late blight specific materials such as those listed in the **July 13th issue of Vegetable Notes** are recommended now. Rotate among classes of fungicides.

Tomato hornworm devouring a pepper plant. Photo: A. Ivy

Yellow shoulder is a physiological disorder of tomatoes related to potassium (K) deficiencies at the time of fruit development. It can also be caused by heat fluctuations or competition with other nutrients for uptake by the plant. It has been seen in several high tunnel tomatoes this season. In one case, temperatures in a high tunnel rose too high, resulting in several months of yellow shoulder in tomato. In another case, yellow shoulder was

reported in the variety 'Big Beef', which is fairly susceptible to the disorder, according to several Extension Educators in NY and NH. 50% shade cloth, put on when the first fruit starts to ripen, has been somewhat effective in preventing yellow shoulder but can also reduce fruit yield. If compost has been applied to a high tunnel, high levels of P, Ca, and Mg could compete with K for uptake by the plant.

Pepper:

Tomato hornworm has been seen in tomato for the past few weeks in MA, but has now also been found in high tunnel peppers in northeastern NY. Tomato hornworm will usually only feed on pepper when they run out of tomato.

Sweetcorn:

Fall armyworm numbers are increasing in traps due to storm fronts continually moving into our region. Scout silking corn now.

Corn earworm trap captures are also increasing, though numbers are higher in trap locations near the ocean in MA and NH where prevailing winds carry this pest into shore. Many locations are at 4 day spray schedules for this pest now (Table 1).

European corn borer second generation flight is increasing, but very few adults are being caught in traps across the state (Table 1). CEW and FAW are likely the pests driving sprays in sweet corn at this time.

Table 1. Sweetcorn pest trap captures for 8.2.17-8.9.17

Location	ECB	FAW	CEW	Spray Interval for CEW
Western, MA				
Sheffield	0	-	4	*5 days*
Whately	1	-	10	*4 days*
Central, MA				
Leominster	1	-	9	*4 days*
Lancaster	4	0	15	*4 days*
Northbridge	0	0	17	*4 days*
Eastern, MA				
Concord	2	0	17	*4 days*
Ipswich	5	0	15	*4 days*
Falmouth	0	-	2	*6 days*
Millis	4	-	7	*5 days*
Sharon	0	-	5	*5 days*
Swansea	0	-	12	*4 days*
Seekonk	2	8	117	*3 days*
NH				
Litchfield	1	25	42	*4 days*
Hollis	2	5	28	*4 days*
Mason	0	5	12	*4 days*
Washington Co, NY	4	4	0	*no spray*
Albany, NY	0	9	1	*no spray*

European corn borer (ECB), Fall armyworm (FAW), Corn earworm (CEW)

POSTHARVEST HANDLING AND STORAGE BASICS

Harvested vegetables are living things that carry on the process of respiration and other biological and chemical processes even after they have been picked. How produce is handled after harvest will directly affect quality characteristics such as appearance, flavor, texture and nutritional value. Attention to postharvest quality can increase repeat sales and support higher prices.

Control of postharvest quality essentially comes down to limiting respiration rate (lowering temperature), controlling water loss (maintaining proper relative humidity), minimizing physical damage to the product (harvesting and handling with care), and avoiding contamination (handling, washing and storing appropriately).

Limiting Respiration

Respiration is a temperature-dependent biochemical process that converts carbon in plant tissue (mainly sugars) to carbon dioxide (CO_2) and water (H^2O) while producing some heat. Rates of respiration vary by the crop (see Gross 2014, Table p. 7 and pp. 68-75, reference below), and should be taken into account when sizing cooling equipment. Fortunately, we can significantly reduce respiration, and therefore maintain high product quality, by reducing product temperature (precooling) and keeping it low (holding or storage cooling). This concept is known as establishing the "cold chain"- a chain of reduced temperature that connects the field to the consumer, ensuring the highest quality produce possible by minimizing respiration.

From the moment of harvest, product quality will deteriorate. Intentional pre-cooling of produce directly after harvest helps quickly reduce the rate of respiration and initiates the cold chain. Examples of pre-cooling include scheduling harvest activities at cooler times of day, shading harvested product in the field prior to transport, forced air cooling through

the packed product with refrigeration, hydrocooling with cool water, and vacuum cooling via evaporation. Once cooled to storage temperature, reliable, refrigerated storage is necessary to maintain high quality.

It is important to note that not all crops can be cooled to the same temperature without resulting in cold or freeze injury and some crops are sensitive to the method of cooling. Crops have different susceptibility to chilling or freeze injury depending on their physiology. Good guidance is available (see Gross 2014, pp. 62-67) and is summarized in Table 16 of the New England Vegetable Management Guide. Common pre-cooling methods are also noted in Table 16. Additionally, a computer-based crop storage planner is available for determining appropriate grouping of your crops and estimating overall respiration load (see Callahan 2016). Chilling injury is also an important consideration when considering particularly sensitive fall-harvested crops and the possibility of lower nighttime temperatures, e.g. winter squash. Notes on chilling injury guidance for these crops are provided in the appropriate crop chapter of the NE Vegetable Management Guide and in the references noted above.

Controlling Water Loss

The control of water loss requires careful attention to relative humidity (RH) of the air surrounding stored product in addition to temperature. RH is a measure of the amount of water vapor in air compared to the maximum amount that can be saturated in that air at a given temperature. Most, but not all, crops are ideally stored at higher RH to prevent water evaporation into the air leading to water loss. The loss of water reduces the weight of the crop and also can lead to lower quality and poor appearance.

Some crops, such as onions, garlic and winter squash, are purposefully "cured" or dried resulting in drier outer skin and cured harvest wounds to allow for long term storage. Because this results in a paper-like layer, these crops are generally stored at lower RH to prevent development of postharvest disease such as molds and fungi on this outer skin. Other than these examples, most crops are best stored at 90-95% RH with specific guidance provided in Table 16, in the crop storage planner noted above, and in the literature (see Gross 2014).

Minimizing Physical Damage

Generally speaking, produce crops live a very gentle life until harvested. Starting with harvest, produce is moved and handled for the first time and, typically, many times after. With each movement there is a risk of physical damage. Even if the damage is not obvious, it can result in bruising or other damage that becomes evident later and can lead to postharvest disease and infiltration by pathogens, which are encouraged by damaged cell tissue. Even during harvest, crops can suffer "harvester blight." For the majority of crops, gentle handling, crates with smooth and clean surfaces, and conveyance with elastic and soft belts and rollers is recommended.

Avoiding Contamination

Sorting and culling are also important practices at this stage. As the saying goes, "one bad apple can ruin the bunch". Sorting allows for different sizes and grades of product to be stored and sold separately and culling can separate damaged or lower quality product from the main lot for sale, rescue donation or compost depending on the defect. The removal of obviously damaged product from the lot helps minimize cross contamination with postharvest pathogens to a larger portion of the population.

Produce can be rinsed to remove soil and debris, and often a sanitizer is added to the rinse water to prevent cross-contamination of plant and human pathogens from one item of produce to another in the same batch (see the following references: LaBorde, Samuels and Stivers 2016, Bihn et al. 2014).

Once packed and ready for storage or transport, care should be taken to avoid contamination of product with other contaminants such as foreign matter and unintentional water such as condensate from refrigeration systems.

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--by Chris Callahan, Agricultural Engineer, UVM Extension.
Excerpted from 2018-2019 New England Vegetable Management Guide.

HARVEST AND CURING TIPS FOR ONIONS

Deciding when and how to harvest onions, then where and how to cure them can feel challenging. When are they really ready to be pulled? Is the weather too wet or too hot to field cure? How did my onion field get so weedy? What should I do if there is a lot of foliar disease in my crop?…here are a few tips from University of Minnesota Extension we found helpful to accompany our usual onion harvest article:

Harvest: Optimum harvest from the standpoint of maximum storage life (before bulb sprouting), occurs while the onion foliage is still partially (30-40%) erect, and long before maximum yield is attained (when tops are completely down and dry). Since yields may increase 30-40% between the stage when tops begin to go down, and the leaves are fully down and dry, it is tempting to leave onions to cure in the field as long as possible. The optimum time for harvest therefore, must be a balance between highest yields and reduced bulb storage quality. Furthermore, excessively field-drying onions increases the risk of bald onions in storage. From UGA Extension: http://bit.ly/2hOqy9I: "Maturity is best determined by pinching the neck of the growing onion. Necks of immature onions are stiff, while necks of optimally mature onions are soft and limber. When the necks are so weak that they cannot support the tops the onions are over mature. Simply observing the percentage of tops having fallen over is not a true indication of maturity, since the tops can be knocked over by strong winds, rain or become limp from lack of moisture."

Digging and windrowing: To facilitate curing onions for harvest and storage, onion rows are undercut, lifted and windrowed for field curing. Rod-weeder diggers and knife undercutters are most often used. After an appropriate interval, the undercut onions are lifted and windrowed. This may be done with tops on or off, but most commonly with tops on to protect the onions form sun scald damage. Windrows are often mechanically "fluffed" to facilitate curing and later combined to facilitate loading.This will also shorten the drying period and should be done after each rainfall. After field drying has occurred, the onions may be topped and placed in storage buildings.

Topping: If onions are to be bulk-stored it is best to store them without their tops. This facilitates handling, loading and unloading the storage. If onions are to be topped and stored, tops must be totally dry, or only the dry portion cut and removed. Cutting through any portion of the top while it is still green or moist may result in excessive *Botrytis* neck rot in storage. In very wet years, do not top onions until after they have been cured. When all or a portion of the onion top is left on, the remaining tops are removed during grading and packing using roller toppers at the storage or packing facility.

Curing: Onions should be adequately cured in the field, in open sheds, or by artificial means before or in storage. Adequate curing in the field or in open sheds may require 2 to 4 weeks, depending on the weather. The best skin color develops at 75 to 90°F. This should be continued until the outer skins and neck are dry. Onions are considered cured when the neck is tight and the outer scales are dry and make a rustling sound when handled. This condition is reached when onions have lost 3 to 5 % of their weight. If not adequately cured, onions are likely to decay in storage. The common form of decay is gray mold rot (*Botrytis*), which occurs at the top of the bulb - hence its name "neck rot". High temperatures and high humidity (80%) during curing with good air circulation favor development of desirable skin color.

Here are our low-tech recommendations for curing and storage in New England: A greenhouse or hoophouse provides a good environment for curing, where temperature, airflow and moisture can be controlled. Be sure to keep the temperature in the house **below 85°F**, which will probably require turning on fans and/or leaving sides and doors wide

open—consider using a black shade curtain over the house to help moderate temperature. Curing can be done in the field, but it is harder to achieve good conditions for curing in an uncontrolled field setting. Avoid field curing onions if rain is forecast and, if it does rain, let the onions dry fully before handling—don't handle the bulbs when they are wet. If the field is weedy, it may be excessively moist and air circulation may be limited; these conditions are not suitable for curing. Temperature and sun are also factors to consider—sunshine and temperatures in the 80's will enhance the bronze color in the skins, but extremely hot sun and temperatures in the 90's can cause sunscald. Onions curing on a sandy soil will heat up more quickly than those curing on a heavier soil.

Storage: To ensure maximum storage life, onions must be promptly stored after curing. Get them out of the sun as exposure to light after curing will induce greening of the outer scales. 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. In fact, holding onions in a barn or garage so that they cool along with the average outdoor temperature in late-summer and fall works quite well. Avoid cooling bulbs to well-below the average daily temperature because they will draw moisture from the warmer air, which can lead to disease. If you are selling the onions within a couple of months, keeping them in an uninsulated barn is fine. An insulated storage room is needed for longer-term storage.

Harvest Tips for Best Quality

1. Be sure onions are well-dried and necks are tight (i.e. the tissue does not slide when you roll the neck between your fingers) before topping. Bacterial diseases and Botrytis Neck rot can move through green tissue into the bulbs. These diseases do not move in dry tissue.
2. Leave 2-3 inches of neck on the bulb. This increases the distance from the cut surface to the bulb for these pathogens to travel.
3. Minimize mechanical injury during harvest & topping. Reduce drops to 6" and pad sharp surfaces. Bruises provide direct entry points for diseases to get started.
4. Grade out damaged onions before putting them into storage. Damaged bulbs give off moisture, which is favorable for development of diseases in storage.

Topped and cured onions are brought into a well ventilated barn to bring them down to temperature slowly for storage. Photo: R. Hazzard

- John Howell, Andrew Cavanagh, & Ruth Hazzard. Resources: CSU Extension and the University of Saskatchewan Vegetable Program. Updated by S. Scheufele, 2017

FUNGAL FRUIT ROTS OF PUMPKINS AND WINTER SQUASH

Many types of pathogens—fungi, bacteria, and viruses—can cause fruit rot, fruit spotting, and other fruit abnormalities in pumpkins and winter squash that render them unmarketable. The vast majority of fruit rots are caused by the fungal organisms discussed in this article, although several bacteria (*Xanthomonas campestris* pv. *cucurbitae* and *Pseudomonas syringae* pv. *lachrymans*) can also cause fruit lesions and rots. In addition to the pathogens discussed below, other fungi that can cause fruit rots include *Alternaria alternata* (Alternaria Rot), *Penicillium* species (Blue Mold), *Myrothecium roridum* (Crater Rot), *Pythium* species (Pythium Cottony Leak), and *Rhizopus stolonifera* (Rhizopus Soft Rot). In general, a 2- to 3-year crop rotation is recommended where fruit rots have occurred, as the pathogens can survive in soil or crop residues. Many fruit rot pathogens can also be seed-borne, so buy certified disease-free seed from reputable sources or use fungicide treated seed when possible. For other chemical recommendations please see the New England Vegetable Management Guide.

Phytophthora capsici sporulation Photo: T. Zitter

Phytophthora Fruit Rot (*Phytophthora capsici*): Perhaps the most serious fruit rot in wet years, *P. capsici* infection begins as a water-soaked or depressed spot, most often on fruit undersides which are in contact with the soil. The pathogen produces a white, yeast-like growth that contains many fruiting bodies (sporangia)

and affected fruit may be completely covered. The disease can develop and spread rapidly with excessive moisture and temperatures between 80-90°F. Entire fields may be destroyed. *P. capsici* persists in the soil for many years; no effective crop rotation interval has been determined. **Management**: Manage soil moisture by sub-soiling, avoiding over-irrigating, selecting well-drained fields, and avoiding areas of fields that do not drain well. Destroying diseased areas at the start of an outbreak can be effective in reducing the spread of disease. Planting pumpkins into cover crop mulch or following the biofumigant cover crop 'Caliente' mustard has shown promise in research trials. Pumpkins with hard, gourd-like rinds are less susceptible to Phytophthora fruit blight. 'Lil' Ironsides', 'Apprentice,' 'IronMan,' 'Rockafellow,' and 'CannonBall' have been reported as moderately-resistant. 'IronMan,' 'CannonBall,' and 'Rockafellow' also possess powdery mildew resistance.

Phytophthora lesion. Photo: M. T. McGrath

Fusarium Photo: M.T. McGath

Fusarium Fruit Rot (*Fusarium solani* f.sp. *cucurbitae*): Pumpkin fruits are attacked at the soil line, and the severity of infection varies with soil moisture and the age of the rind when infection occurs. Surfaces of fruit that are in contact with the soil develop tan to brown, firm, dry and sunken lesions which may occur in concentric rings and remain firm unless invaded by secondary organisms. *F. solani* can survive in seed but does not affect the germination or viability of the seed. *F. solani* produces abundant resting spores (chlamydospores) in the soil, but only persists there for 2-3 years. Wounding is not necessary for infection to occur. Cultivars vary in their resistance with larger pumpkins generally being more susceptible. **Management**: A 3-year rotation is recommended. Fungicide-treated seed should be used to reduce initial inoculum. Culling of unmarketable fruit can reduce the risk of spread during the post-harvest period.

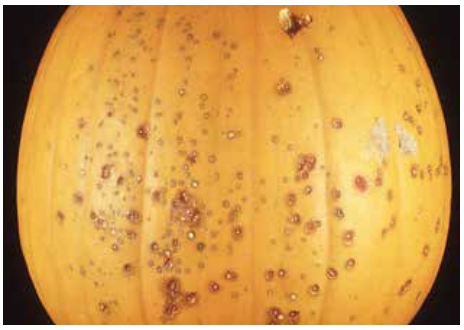
Close up of Black Rot showing picnidia Photo: T. Zitter

Black Rot (*Didymella bryoniae*): Also called Gummy stem blight when it occurs on other plant parts, this disease produces a distinctive black decay. Initially, a brown to pink, water-soaked area develops, in which numerous, black fruiting bodies (pycnidia) are embedded. Black rot on butternut may appear as a superficial, hardened, tan to white area which can develop concentric rings. Large Halloween pumpkins are more susceptible to black rot than smaller pie types. The pathogen is soil- and seed-borne and can overwinter in infected crop debris as dormant mycelium or chlamydospores. Wounding is not required for disease initiation, but wounding by striped cucumber beetles, aphid feeding, and powdery mildew infection all lead to increased susceptibility. **Management**: Start with certified, disease-free seed. A 2-year rotation out of cucurbits can reduce field inoculum. Crop debris should be plowed under promptly after harvest. Control of powdery mildew can significantly reduce black rot infection of pumpkins. Avoid chilling injury to winter squash and pumpkins in storage as this activates dormant black rot lesions and increases losses in storage. Store fruit at 50-55°F and ~60% relative humidity.

Antracnose: water soaked lesions (right), older damage (left). Photo: K. Campbell-Nelson

Anthracnose (*Colletotrichum orbiculare*): Cucurbit anthracnose is common on the fruit and foliage of watermelons, squash, melons, and cucumbers in humid regions. Young fruit may turn black and die if their pedicels are infected, while older fruit develop circular, noticeably sunken, dark-green to black lesions which may produce a salmon colored exudate under moist conditions. The pathogen is both seed- and soil-borne and can cause serious crop losses. Infected fruit may have a bitter or off-taste, in addition to lesions, and can deteriorate quickly due to the invasion of secondary rot organisms. *C. orbiculare* survives between crops in infected crop debris, volunteer plants, and weeds in the cucurbit family. The fungus does not require a wound to initiate infection and is spread by splashing water, workers, and tools in warm, humid weather. **Management**: Start with certified,

disease-free seed and/or grow resistant cultivars. Rotate out of cucurbits for 2 years and control volunteer cucurbit plants and weeds. Collect and burn or plow down deeply infected crop debris after harvest. Avoid wounding fruit during harvest and immerse fruit in a solution of 120 ppm chlorine after harvest.



Scab. Photo: T. Zitter

Scab (*Cladosporium cucumerinum*): Scab can affect all parts of cucurbit plants, but is most serious because of the disfiguring lesions that develop on fruit. The disease is favored by heavy fog, heavy dews, or light rains, and temperatures at or below 70˚F. The spores (conidia) are borne in long chains, are easily dislodged, and spread long distances on wind. On foliage, the first sign of the disease is pale-green, water-soaked lesions which turn gray and become angular as they are contained by leaf veins. On fruit, spots first appear as small sunken areas which can be mistaken for insect injury. The spots may ooze a sticky liquid and become crater-like as they darken with age. Dark green, velvety layers of spores may appear in the cavities and secondary soft-rotting bacteria can invade. Severity of symptoms varies with the age of the fruit when it becomes infected. *C. cucumerinum* overwinters in infected crop debris and soil, and may also be seed-borne. Spores produced in the spring can infect in as little as 9 hours, produce spots within 3 days, and produce a new crop of spores within 4 days. **Management**: Start with disease-free seed or use fungicide-treated seed. Do not save your own seed if the disease is present. Select well-drained fields with good air circulation to promote rapid drying of foliage and fruit. Rotate out of cucurbits for 2 or more years. During cool, wet weather fungicide sprays may not be entirely effective because of the rapid disease cycle.

Plectosporium. Photo: T. Zitter

Plectosporium Blight (*Plectosporium tabacinum*): Like scab, Plectosporium blight is most damaging when it affects cucurbit fruit. Pumpkins, yellow squash, and zucchini are the most susceptible. Lens to diamond shaped, white to tan, lesions occur on stems, leaf veins, petioles, peduncles, while fruit lesions are more rounded. Severe stem and petiole infections can result in death of leaves and defoliation. Infected stems are dry and brittle. On fruit, the pathogen causes white, tan, or silvery russeting; individual lesions can coalesce to form a continuous scabby layer. Plectosporium blight is favored by wet weather; in wet years, crop losses in no-spray and low-spray fields can range from 50 to 100%. No resistant cultivar of pumpkins has been reported and it has not been reported to be seed-borne. **Management**: *Plectosporium tabacinum* survives in crop debris, so plow deeply immediately after harvest. Rotation with non-cucurbit crops for 2 years can reduce disease. Choose sunny, well-drained sites for cucurbit production.

—M. Bess Dicklow, UMass Plant Diagnostic Lab

News

Recall of Organic Insecticide Azatrol

Kerry Richards; University of Delaware Pesticide Safety Education Program; pesticidesafety@udel.edu

On July 27, 2017 PBI-Gordon Corporation announced a nationwide recall of all Azatrol products, specifically **Gordon's Azatrol EC** insecticide and **Azatrol Hydro Botanical Insecticide**. Both of these products can be identified by the EPA Registration Number 2217-836.

PBI Gordon initiated this national recall in part due to the result of a June 2017 decision by Oregon Department of Agriculture to issue a Stop Sale, Use, or Removal (SSUR) of these products after discovering the presence of five synthetic pesticide active ingredients which were not listed on the labels of these two registered organic pesticide products.

While the five conventional active ingredients found in these two products can be used on a variety of ornamental, food, and feed crops safely, because they were not identified on the labels of the Azatrol products this constitutes misbranded and adulterated product. The non-declared conventional pesticide active ingredients found in the two organic pesticide

products are: quantifiable levels of permethrin, bifenthrin, cypermethrin, cyfluthrin, and chlorpyrifos. Malathion was not detected at a quantifiable level.

PBI-Gordon is asking distributors to return any unused Azatrol in their inventories, as well as any unused Azatrol returned to distributors by their customers.

SARE FARMER GRANTS, 2018

The USDAs Northeast Sustainable Agriculture Research & Education Program (NESARE), Farmer Grants offers up to $15,000 in support or innovative ideas that can advance production practices for growers and producers in the Northeast. The Farmer Grants are for commercial producers who have an innovative idea they want to test using a field trial, on-farm demonstration, marketing initiative, or other technique. Applications can be downloaded from the NE-SARE website at http://www.nesare.org/Grants/Get-a-Grant/FarmerGrant

The application deadline is November 28, 2017. NE SARE provides an excellent guidance video at: http://www.nesare.org/Dig-Deeper/Grant-Workshop-PowerPoints-and-Webinars/Farmer-Grant-narrated-PowerPoint

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Vegetable Notes. Katie Campbell-Nelson, Lisa McKeag, Susan Scheufele, co-editors.