



UMass  
Extension

# Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



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## CROP CONDITIONS

This season has been a relatively good one for growing, and markets are flush with ripe produce. One grower commented that while wholesale accounts are down this month, road side stand sales are going through the roof, so can't complain! With consistent heat and sun, pumpkins are ripening unseasonably early, and some growers are starting to pull giant orange beauties out of the field. Other early, fresh-eating winter squashes, like spaghetti and delicata, are being harvested in some fields where plants have succumbed to the dry hot weather and a lack of foliage has put fruit at risk of developing sunscald (see article this issue). Tomatoes are pouring in now and heirloom varieties are sizing up nicely, if not ripe yet—growers (and tasters!) are anxiously anticipating this year's tomato contest to be held at the new Boston Public Market next Thursday, August 20<sup>th</sup>!!! Water continues to fall all at once, or not at all in some spots. Much of the state was drenched Tuesday with 0.5-1.6 inches of rain and while the rain was not torrential, some growers with well-weeded fields and plastic beds saw some soil erosion. The last of the direct-seeded crops are going in and many tired fields are going down. Weeds that escaped earlier cultivation or herbicide attempts are large and woody now, and seeds of some summer annual weeds, notably pigweed and ragweed, are starting to mature. It's a good time to start thinking about mowing down old, tired successions of things like summer squash and cukes, or perhaps potato foliage if tubers are well sized, in order to prevent weed seeds from being added to the soil seedbank. For some perspective, red root pigweed seeds mature from August-September, with each plant producing up to one million seeds, 95% of which are viable, and can survive in soil up to 40 years. Lambsquarters, ragweed and many others are similarly fecund, and velvetleaf seeds can last up to 60 years! Whatever weeding or mowing you can get to today will benefit your farm for decades to come.



*Rainbow over a farm after a recent rain.*

There is still time to provide feedback to demonstrate a need for a label expansion of Entrust SC to include soil drench applications for cabbage root maggot control by filling out our survey here:

<https://www.surveymonkey.com/r/3X5F7WS>.

## PEST ALERTS

[Vegetable scouting sheets](#) can be found on the UMass Extension Vegetable Program website. When not given here, refer to the [New England Vegetable Management Guide](#) for scouting thresholds and treatment options.

**Allium:** Grade out damaged or diseased onions when moving them from their drying/curing environment to storage (32-40°F, 65-70% RH). Damaged bulbs give off moisture, which is favorable for development of diseases in storage. As onions are harvested, [onion thrips](#) will begin moving into other nearby host crops such as cucurbits, carrots and brassicas.

**Brassica:** [Onion thrips](#) can be a major pest of brassicas, particularly once their

Accumulated Growing Degree Days (F): 1/1/15 – 8/12/15	
Location	GDD Base 50°F
Pittsfield, MA	1500.7
S. Deerfield, MA	1772.7
Northboro, MA	1818.5
Dracut, MA	1808.6
Boston, MA	1855.4
Sharon, MA	1833.7
Seekonk, MA	1874.1
Burlington, VT	1816.3
Middletown, RI	1682.7

preferred allium hosts are removed from the field. Thrips cause rough, golden or brown scars to form on the underside of open leaves, or produce scars and discolored layers within cabbage heads. Scout fields for this pest, and see article this issue on control of onion thrips in cabbage.

**Sweet Corn:** The second generation of [European corn borer](#) is starting to hatch now, (the beginning of second flight is 1400 GDD; first eggs are 1450 GDD; and egg hatch is 1550 GDD). When moths are active during silking, eggs are laid on leaves near the ear and larvae move directly into the ear by tunneling through the husk or down the silk channel. [Corn earworm](#) moths are being captured at low numbers in Western MA, where recommendations are either for no sprays or for 6-day intervals; pressure is higher on the coast where spray intervals are down to 4 days. [Fall armyworm](#) captures are more varied with a few hot spots around the state capturing numbers high enough to warrant scouting for this pest and treating at a threshold of 15% combined damage including ECB. [Thousands of blackbirds](#) are causing severe damage in sweetcorn in NH.

The key to using scare tactics effectively is to switch between methods (noisemakers, balloons, etc.) and to move them frequently since birds will get accustomed to one scare tactic after another. Scare devices should be in fields one week before harvest through the end of harvest.

**Cucurbit:** [Cucurbit downy mildew](#) was confirmed on “Straight 8” cucumber in Franklin Co., MA but not in VT or RI where scouts have also been on the lookout. In MA, if you have not done so already, it is time to switch over to using downy mildew specific materials to protect cucurbits, rotating between classes of fungicides for resistance management. Products with good to excellent efficacy against downy mildew (with FRAC codes) include: Ranman (21), Previcure Flex (28), Revus (40), Presidio (43), or Zampro (45+40). Track occurrence of the disease here: <http://cdm.ipmpipe.org/scripts/map.php>. [Powdery mildew](#) is still prevalent in many New England states. Mow down older successions after harvest and protect younger plants with fungicides. Effective materials are different from those used against downy mildew. There are many good options for conventional and organic systems including: Torino, Quintec (rated very effective), Group 3 (Procure, Rally, Tebuzol, Folicur, Inspire Super), or Group 7 (Pristine, Fontelis, Luna), as well as Zing!, Milstop, Kaligreen, Sulfur, and Oxidate. [Scab](#) was confirmed on summer squash and zucchini in Hampshire Co., MA. If diagnosed in your field, rotate to a non-cucurbit crop for 3 years. Fungicide applications must be applied before fruit formation to be effective.



*Cucurbit Downy Mildew (Pseudoperonospora sporangia and sporangiophores)*

**Solanaceous:** [Late blight](#) was confirmed in northern ME this week on potato; still no confirmation of the disease in MA or RI although scouting continues. See the [MA late blight DSS](#) for preventive spray intervals. Track progression of the disease here: <http://usablight.org/map>. [Early blight](#) in tomato is prolific at this point and is likely to spread given recent mild, rainy weather, as it prefers high moisture and temperatures of 75–84°F. Adequate fertility is important for managing this disease, so make sure that the crop has enough N for foliage and fruit production to keep the older leaves healthy. **Phoma leaf spot** was confirmed on tomato in Hampshire Co., MA this week. Historically a problem in the south, this disease is rarely found in MA. It mostly causes foliar symptoms but can cause fruit rot on green or ripe fruit which can worsen after harvest. This disease enters plants through wounds, and spreads when workers and their tools have disturbed the plants. Harvest symptomatic plants last.

**Multiple:** [Spotted Wing Drosophila](#) trap captures continue to rise, with numbers reaching as high as 266 flies, in one location. While this is a significant increase over last year’s counts for this same location and date, it is not representative

Sweet Corn Pest trap counts for 8/6-8/13.				
Location	FAW	ECB	CEW	Spray Interval for CEW
<b>Western MA</b>				
Hadley	na	0	na	na
South Deerfield	9	3	1	no spray
Whately	2	5	2	6 days
<b>Central &amp; Eastern MA</b>				
Millis	0	0	0	no spray
Sharon	na	5	31	4 days
<b>NH</b>				
Litchfield	5	12	0	no spray
Hollis	4	0	1	no spray
<b>Burlington, VT</b>				
Kingston, RI	7	0	8	4 days
Scituate, RI	0	1	0	no spray

of the numbers from other trapping locations that are still seeing numbers below (if only barely) the one hundred mark. Continued vigilance in sanitation measures within plantings can help alleviate some of the pressure from this pest. For more detailed information, take a look at the fruit advisor Spotted Wing Drosophila webpage: <https://extension.umass.edu/fruitadvisor/news/spotted-wing-drosophila-drosophila-suzukii>.

## **FUNGAL FRUIT ROTS OF PUMPKINS AND WINTER SQUASH**

Many pathogens - fungi, bacteria, and viruses - cause fruit rot, fruit spotting, and other fruit abnormalities in pumpkins 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). Successful management of pumpkin fruit rots depends on accurate identification of the causal organism so that the appropriate control measures can be employed. Refer to the [New England Vegetable Management Guide](#) for chemical control options. Many of these diseases show up in storage, and it is important to know which disease is present and dispose of the infected fruit properly. Dumping rotting fruit in your fields or compost pile may result in higher initial inoculum and more disease the following year. In the case of *Phytophthora capsici*, disease could be devastating for years to come.

### **Phytophthora Fruit Rot (*Phytophthora capsici*)**

Perhaps the most serious fruit rot in wet years, *Phytophthora* infection begins as a water-soaked or depressed spot, most



*Phytophthora capsici*

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. *Phytophthora* 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 disease development can be effective. 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 or shells 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 capsici*

### **Fusarium Fruit Rot (*Fusarium solani* f.sp. *cucurbitae*)**

Pumpkin fruits are attacked by *Fusarium* 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. It does not survive for more than 1-2 years in seed and does not affect the germination or viability of the seed. *Fusarium* 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 being generally more susceptible.



*Fusarium Fruit Rot*

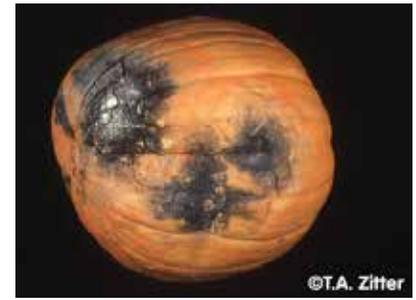


*Fusarium Fruit Rot*

The pathogen can be seed-borne, both internally and externally to the seed coat. **Management:** Because this pathogen exists in several races, knowledge of the prevailing races is needed so that resistant varieties may be selected. A four year rotation out of pumpkins will eliminate soil propagules and fungicide-treated seed will reduce initial inoculum. Culling of unmarketable fruit can reduce the risk of spread during the post-harvest period.

### **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 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 chlamyospores. Wounding is not required for disease initiation, but wounding by striped cucumber beetles, aphid feeding, and powdery mildew infection enhances susceptibility. **Management:** Start with certified, disease-free seed. A two 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.



*Black Rot*



*Black Rot*

### **Anthraxnose (*Colletotrichum orbiculare*)**

Anthraxnose 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 exhibit a salmon colored exudate in moist weather. The pathogen is both seed- and soil-borne and can cause serious losses. Infected fruit may have a bitter or off-taste, in addition to lesions, and deteriorate quickly due to the invasion of secondary rot organisms. *C. orbiculare* survives between crops in infected crop debris, in volunteer plants, or weeds of 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.



*Anthraxnose*

### **Scab (*Cladosporium cucumerinum*)**

This pathogen attacks all parts of the plants, but is most serious because of the disfiguring scab lesions that develop on fruit. The disease is favored by heavy fog, heavy dews, 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. 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 fruit when it becomes infected. *C. cucumerinum* overwinters in infected squash and pumpkin vines, soil, and may also be seedborne. Spores produced in the spring can infect in as little as 9 hours, produce spots by 3 days, and produce a new crop of spores by 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 as the pathogen over seasons very



*Scab*

well. During cool, wet weather fungicide sprays may not be entirely effective because of the rapid disease cycle.

### **Plectosporium Blight (*Plectosporium tabacinum*)**

Like Scab, *Plectosporium* Blight is most damaging when it appears on the 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, and fruit. 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, to silvery russeting; individual lesions can coalesce to form a continuous scabby layer. In wet years, which favor disease development and spread, 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.



*Plectosporium Blight*

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## **BEST CONTROL OF ONION THRIPS IN CABBAGE**

-Originally published in *Cornell Veg Edge Weekly* 8/5/15.

Onion thrips (OT) are often considered the most important insect pest of cabbage. The feeding of these tiny insects causes unsightly brownish blisters and scarring on the leaves of cabbage heads, often several layers deep (Fig. 1). Damaged leaves need to be trimmed before cabbage can be marketed resulting in considerable economic losses in yield and grade.

When possible, the use of onion thrips-tolerant varieties can go a very long way towards minimizing losses from onion thrips. For example, summer cabbage varieties, Capture (Bejo - 2733), Celebrate (American Takii - T541) and Benelli (Bejo) exhibited excellent thrips tolerance in our 2009 Cornell trial. Here, Celebrate had virtually no OT damage, compared to Bajonet, which had more than 4 layers affected. Information on the relative tolerance/ susceptibility of storage, kraut and summer cabbage varieties evaluated in Cornell trials from 2005 to 2009 is available online at the new Cornell Vegetable Program website: <http://cvp.cce.cornell.edu/>, from the sliding menu on top, click on “cabbage” and you will need to “view the complete list of cabbage content” to see all the reports.

When onion thrips-tolerant varieties are not an option, the most effective insecticide is the active ingredient imidacloprid such as Admire. Several years of Cornell studies (Shelton *et. al.* 2003, 2004, 2008, 2010) have consistently



*Fig. 1. Onion thrips feeding in cabbage resulting in unsightly brown blister and scarring that needs to be trimmed at the expense of yield and labor. Photo: C. Hoeping.*

found that Admire provided the best control of OT when applied to the soil as a directed spray to the base of plants at transplanting and 4 weeks after transplanting. Here, Admire Pro reduced OT damage from 6 to 2 layers. The next best insecticides for OT control in these trials were foliar applications of Provado (which has been replaced with Admire Pro) and Movento, followed by Assail and Radiant, then dimethoate (discontinued), and finally Warrior. Admire can be an especially economic OT control option for susceptible varieties of summer cabbage. Note that Admire Pro is a different formulation than Admire 2F and is used at different rates. There are several generic 2F formulations of imidacloprid and some have control of onion thrips in Brassicas on the label and some do not. For example, Alias 2F does, while Couraze 2F and Montana 2F do not. Imidacloprid also controls aphids and swede midge.

-by Christy Hoepting, Cornell Vegetable Program.

## **LATE SUMMER COVER CROPS**

A well-established late season cover crop increases organic matter, improves soil structure, scavenges remaining nutrients, chokes out weeds, and prevents soil erosion. Grains and grasses can provide all of these functions and legumes can add additional nitrogen. Each has strengths and weaknesses. Below is a list of several good choices for this time of year, depending on your specific goals and field conditions.

### **Grasses**

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

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

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

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

**Winter Wheat** (*Triticum aestivum*) is increasingly being used as a cereal grain and as a cover crop. It is winter hardy, but does not grow as tall or mature as quickly as rye so there is no rush to kill it in early spring and risk compacting wet soils. Wheat is excellent for erosion control, scavenging N, P and K, building soil organic matter and improving tilth. For best results, plant it in late summer to early fall, before September 15th. Best growth will be in well-drained soils with moderate fertility. Rye is a better choice on wet soils. Wheat works well as a nurse crop



*Oats cover crop in December*

for legumes such as hairy vetch, clover, or peas. **Seeding rate:** 90-160 lbs/A broadcast; 60-120 lbs/A drilled; 60-90 lbs/A mixed with a legume.

**Triticale** (*x Triticosecale*) is a hybrid between wheat and rye. It can be seeded as early as August and can produce more fall growth than winter wheat, providing more weed suppression and erosion control. **Seeding rate:** 90-100 lbs/A broadcast; 75-80 lbs/A drilled; 60-90 lbs/A mixed with a legume.

### Legumes

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

**Hairy Vetch** (*Vicia villosa*) usually benefits from being grown with a nurse crop such as rye, oats or wheat to help reduce matting during spring and to keep weeds down. Both the vetch and the grain can be mixed together in the seed drill. In the spring, vetch is incorporated at early bloom, typically in late May. If the vetch is planted in late July or early August, it is less likely to survive the winter, which can be a good thing if you've ever struggled with self-seeded vetch. With a good flail mower, vetch can be used in a reduced tillage system without matting and tangling in the equipment. **Seeding Rate:** 25-40 lbs/A broadcast; 15-40 lbs/A drilled, 15-20 lbs/A mixed with a grass.

**Red Clover** (*Trifolium pratense*) is a short-lived perennial that is somewhat tolerant of soil acidity or poor drainage. Mammoth red clover produces more biomass for plow-down than medium red clover, but does not regrow as well after mowing. Mammoth will often establish better than medium red clover in dry or acid soils. Sow in early spring or late summer. Red Clover can be undersown in mid-summer into corn or winter squash before it vines, and into other crops such as fall brassicas if soil moisture is plentiful. **Seeding rate:** 10-15 lbs/A broadcast; 6-15 lbs/A drilled; 6-10 lbs/A mixed with a grass.

**White Clover** (*Trifolium repens*) is a low-growing perennial, tolerant of shade, moisture and slightly acid soil. Ladino types are taller and live longer than the Dutch or New Zealand types. The clovers do not compete well with weeds unless mowed to improve lateral growth and establishment. Thus, they are suitable for use in mowed walkways or alleys. Seed tends to be expensive, although stands can last for many years, especially if mowed or grazed, since the laterally-growing stolons continue to root. Fall seeding can be successful as Ladino white clover has shown high rates of N-fixation compared to other legumes at extended periods with cool temperatures (50°F). **Seeding rate:** 7-14 lbs/A broadcast; 10-12 lbs/acre drilled; 2-6 lbs/A in a mix.

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



*Vetch can be difficult to manage in strip till systems even after killing with round up*



*Overseeded clover germinating between rows of Brussels sprouts*

## **Brassicas**

Brassicas may be used as cover crops for pest management or in the case of the forage radish, for improving water drainage and soil structure. These cover crops should not be planted successionaly with any brassica crops since they are in the same family, and are susceptible to the same pests.

**Radish** (*Raphanus sativus*), known as Daikon, tillage, forage or oilseed are appropriate biological subsoilers, often producing 8-14 inch tap roots. With its deep roots, this crop can recover N, P, S, Ca and B for the following season, but must be planted into a crop early in the spring or else these nutrients are lost through fast decomposition and the deep root holes. Best planted in late August, this cover crop typically winterkills in December or January. It can also be used as animal forage. A unique no-till strategy with forage radish includes seeding it in the late summer along with cover crop mixtures on 6 ft. centered beds, then in the spring, place transplant plugs directly in the holes where the radishes grew. Read more about this method of planting in this SARE funded grant titled: [Evaluating no-till and biological strip-till methods for commercial seedless watermelon production](#). **Seeding rate:** 10-13 lbs/A broadcast; 7-10lbs/A drilled.

**Brown Mustard** (*Brassica juncea*) found in many of the 'Caliente' seed mixes is a biofumigant planted to combat root knot nematode and a variety of soil-borne fungal pathogens including *Fusarium*, *Verticillium*, *Rhizoctonia*, *Pythium* and *Phytophthora capsici*. It is also allelopathic against weeds. If allowed to flower, this crop is highly attractive to honey bees. Successful biofumigation with this cover crops is achieved by following these steps: 1) Apply adequate fertility (50lbs N/A and 20 lbs S/A). 2) Allow it to flower 2 weeks before incorporation. 3) flail mow. 4) disc under. 5) Roll or pack the soil immediately after incorporation. 6) Add irrigation to enhance fumigation or incorporate before rain. Plant this in late August through September. Other brassica cover crops include Rapeseed or Canola and Turnips, which are often used as livestock forage. **Seeding rate:** 10-15lbs/A broadcast; 8-12 lbs/A drilled.



*Brown mustard is highly attractive to bees*

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

### **Cover Crop Resources:**

- A Comprehensive Guide to Cover Crop Species used in the Northeast United States. prepared by: Shawna Clark. <http://www.plant-materials.nrcs.usda.gov/pubs/nypmcpu10645.pdf>
- Managing Cover Crops Profitably: 3rd ed. Published by the Sustainable Agriculture Network, Beltsville, MD. <http://www.soilandhealth.org/03sov/0302hsted/covercropsbook.pdf>
- Cover Crop Plant Guides prepared for the USDA by: NRCS, RMA and FSA. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/plantsanimals/plants/projects/?cid=stelprdb1077238>
- Cover Crop Chart prepared by USDA-ARS. <http://www.ars.usda.gov/Main/docs.htm?docid=20323>

- Katie Campbell-Nelson adapted from work by R. Hazzard & F. Mangan, UMass; Vern Grubinger, UVM and Thomas Bjorkman, CU. Resources: *Managing Cover Crops Profitably*, 3rd edition, published by Sustainable Agriculture Network; *New England Vegetable Management Guide* ([www.nevegetable.org](http://www.nevegetable.org)).

## **SUNBURN ON VEGETABLES**

-Originally published in *Purdue Extension Vegetable Crops Hotline*, 8/4/2015

Loss of foliage due to poor growing conditions or disease can cause fruit to be exposed to the sun. Hot temperatures and direct sunlight can lead to areas of the fruit that appear bleached or sunburned. Sunburned fruit may not be marketable.

To reduce the probability of sunburned fruit, every effort should be made to maintain foliage throughout the season. Early wet weather encouraged foliar disease and recent hot, dry weather may have restricted foliar development. Orienting vegetable plantings to minimize damage from the prevailing winds and providing windbreaks such as strips of rye or wheat may help to reduce sunburn.

Several products are available that are labeled for use as a preventive for sunburn. These products may be broken into two groups: kaolin (clay) based products and calcium carbonated based products.

Kaolin based products include Surround. Some Surround products are labeled for use as sunburn protection, while others are not. For example, the label for Surround WP includes language about reducing sunburn damage, whereas Surround CF lacks such language. These products are designed to place a layer of the clay product on the surface of the fruit. The clay will reflect the sunlight, thus reducing the sunlight that reaches the fruit. Kaolin based products should be applied in sufficient spray volume to obtain 'near-drip coverage'. Growers should be prepared to wash off the kaolin product if necessary prior to sale.

Products with the active ingredient calcium carbonate represent the other major category of sunburn protectant. Products include Purshade and Sombrero. These products are also designed to reflect sunlight away from the surface of the fruit. Read the label to make sure it is labeled for sunburn protection. The label for Purshade specifies NOT to apply to runoff. As with kaolin products, the grower should be prepared to wash the product off the fruit surface.

Since both the kaolin and calcium carbonate based products work by reflecting sunlight away from the fruit surface, there is some concern that these products may reduce sunlight that reaches the leaves and therefore the photosynthesis that drives plant growth. However, a study of the use of kaolin in apples found that the reduction of sunlight to leaves may be compensated for by the reflection of sunlight into the interior of the canopy. The benefit of these products for managing sunburn may out-weigh any reduced photosynthesis. However, growers must balance the possible benefits and risks of using any of these products.

A study in Michigan looked at the use of kaolin to reduce shoulder check in fresh-market tomatoes, a disorder described as a surface roughness that appears on the shoulder area of the fruit. The use of a kaolin product actually increased the amount of shoulder check found in tomatoes.

Vegetable growers should avoid using products to manage sunburn unless the label specifically states such a use on the label. For example, anti-transpirant products (e.g., Vapor Gard) do not list on the label anything about reducing sunburn on vegetable crops.

Some pesticides may aggravate sunburn problems. For example, products with the active ingredient chlorothalonil (e.g., Bravo, Echo, Equus) have a warning that applying the product to mature fruit may result in sunburn to the upper surface. In general, it is best not to apply any pesticides during the heat of the day.

Sunburn or sunscald damage of vegetables can be a problem, especially in years with as much sun and heat as we have witnessed this season. Avoiding sunburn on vegetables involves maintaining good foliage cover and the judicious use of the right product if necessary.



**Fig 1.** *Vegetables such as this watermelon may become sunburned if lack of foliage cover exposes the fruit to excess sun and heat. (Photo by Dan Egel)*

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# EVENTS

## 2015 NOFA Summer Conference

**When:** Friday, August 14 to Sunday, August 16, 2015

**Where:** UMass Amherst Campus

This year's main conference features 144 individual sessions with 27 different topic areas. Workshops address organic farming, gardening, land care, draft animals, homesteading, sustainability, nutrition, food politics, activism, and more. The theme for this year's Conference is "Healing the Climate, Healing Ourselves: Regeneration through Microbiology".

This year's conference will include sessions with UMass personnel:

- Amanda Brown, Director of the UMass Student Farm; Tour of the UMass Ag Learning Center
- Lisa McKeag, Extension Vegetable Program; Pest Scouting in the Field at Simple Gifts Farm
- Susan Scheufele, Extension Vegetable Program; Integrated Pest Management in Brassicas

## Professional Development Soil Health Workshop Series:

### Soil Tests for New England and Interpreting them for Phosphorous Management

**When:** Monday, August 17, 2015 from 3:00pm to 5:00pm

**Where:** Slobody Building, 101 University Drive, Suite C4, Amherst, MA 01003

The University of Massachusetts Extension has been funded by a Sustainable Agriculture Research and Education Professional Development Grant (2014-2017) to provide educational opportunities to agricultural service providers and farmers in soil health topics. Presenters at [this event](#), to be held at UMass' Slobody Building at 101 University Drive (next to the Amherst post office), will discuss soil extraction methods and interpreting them for phosphorus management.

- **Tom Morris, University of Connecticut Professor of Plant Science** will present methods of different soil extractions and tests, with a focus on those appropriate for New England soils. With his experience in field research on nitrogen and phosphorous, Tom will present agricultural service providers with a basic understanding of the chemistry of phosphorous in the soil, how it behaves, how best to assess P status of soil in different growing systems, how to assess potential loading from soil applications of fertilizer, compost or manure, and how to mitigate soil with excess phosphorous aside from not adding more (e.g., cover crops or other ways to use up or sequester phosphorous to prevent off site movement or contamination).
- **Tom Akin, Natural Resource Conservation Service Agronomist** will present work on evaluating a new soil extraction method for New England with data from Massachusetts farms. The new Haney Soil Health Test is being tested in Massachusetts to evaluate it's ability to better predict active carbon and other indicators of soil health.
- **Hotze Winja, a chemist with the Massachusetts Department of Agriculture**, will provides an update on the new Plant Nutrient Regulations: i.e., background on the development of these regulations, overview of what the regulations require, effective dates, plans for implementation, and outreach and education efforts.

For Certified Crop Advisors this event is approved for 2 CEUs.

## The 31st Annual Massachusetts Tomato Contest

**When:** Thursday, August 20, 2015 from 9am to 1pm

**Where:** Boston Public Market Demonstration Kitchen, 100 Hanover Street, Boston, MA 02108

Tomatoes will be judged by a panel of experts on flavor, firmness/slicing quality, exterior color and shape. Always a lively and fun event, the day is designed to increase awareness of locally grown produce.

Farmers who want to submit entries can bring tomatoes to the market between 9:00 am and 10:45 am on August 20th or drop their entries off with the corresponding registration form to one of several locations around the state on August 19th. These tomatoes will be brought in to Boston on Thursday. For the complete details, including contest criteria and a registration form, go [here](#) or [www.mass.gov/eea/agencies/agr/markets/farmers-markets/tomato-contest.html](http://www.mass.gov/eea/agencies/agr/markets/farmers-markets/tomato-contest.html).

The 31st Annual Tomato Contest is sponsored by the Massachusetts Department of Agricultural Resources, New England

Vegetable and Berry Growers Association and Mass Farmers Markets in cooperation with the Boston Public Market.

### [IPM Field Walk](#)

**When:** Tuesday, August 25, 2015 from 3:30pm to 6pm

**Where:** [Hurricane Flats](#), 975 S. Windsor St. South Royalton, VT

Join us to learn how to scout for disease and insect pests in the field and discuss effective organic control strategies with farmer Geo Honigford, Ann Hazelrigg and Gabriella Maia (UVM Disease Diagnostic Laboratory) and Katie Campbell-Nelson (UMass Extension Vegetable Program). Sponsored by Vermont Vegetable and Berry Growers Association and NOFA-VT. Bring a hand lens if you have one. This series is funded in part by a Northeast IPM Center grant.



### THANK YOU TO OUR SPONSORS



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

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