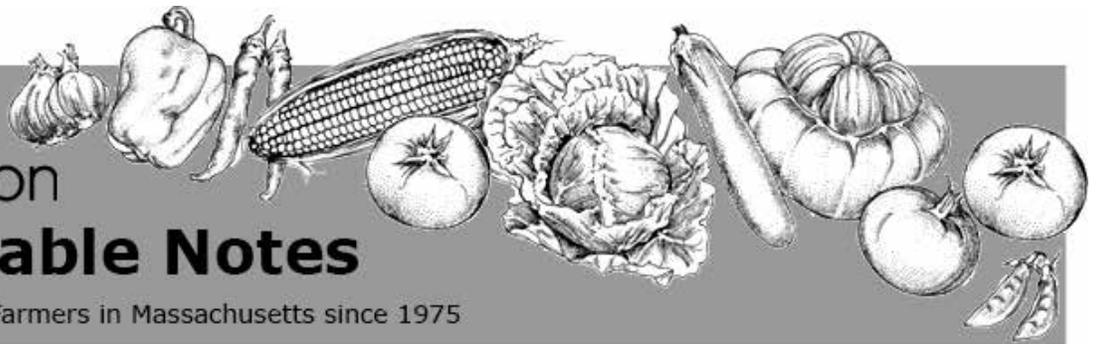




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Extension

# Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



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## CROP CONDITIONS

Dry is the word of the month. Some folks may have gotten a scant sprinkle, while some got a 10-minute deluge that largely ran off of the parched soil surface, but the majority of fields are still bone dry and dusty, with little rain in the forecast. As long as you have water and can get it to the crops that need it, plants are looking good and foliage is lush and green and relatively disease-free. Crops that can't be irrigated are growing slowly, and water stress is showing up in various crops, presenting as tip burn, tip dieback, sunburn, and scorching of leaves. Incidents of sunscald of exposed fruits will likely increase in the coming weeks, especially where leaves have wilted and reduced fruit cover. In flowering crops, high heat effects pollen formation and causes deformation or even abortion of fruits. Hot soil can cause damage to fine roots, leading to poor uptake of water and nutrients. Adequate watering can help mitigate many of these effects, and shading can be used for sensitive crops. When water supply gets low or is in high demand, it's important to know when water is needed in a crop's lifecycle and not to irrigate more than you need to. Other tips for making use of scarce supplies are to plant crops that have the same rooting depth and water needs together, prioritize high value crops, and time watering to avoid the hottest part of the day, but avoid irrigating overnight. See the article in this issue on using soil moisture sensors to improve irrigation efficiency.

The weather remains good for killing weeds, which are also growing well right now despite the dry conditions. Where weeds can get water, in irrigated beds, they are taking off quickly, with weeds bursting out of planting holes in plastic-mulched beds. We have often focused on killing weeds before they go to seed because those seeds can live for decades in the soil. Well, last night at our last spring twilight meeting we learned from Bryan Brown of NYSIPM Program that, while some seeds can survive for long periods in the "weed seed bank" in the soil, the vast majority of seeds will die in the first 1-2 years! This means preventing seed production this year can have an immediate impact on your weed pressure next year. Weed scientists have a saying, "1 year's seeding is 7 years weeding!" If you missed the meeting, you can find a recording of it, and of all our other virtual twilights, [here](#).



*A weedy research plot in 2015 (above) and the same plot the next year (below), looking much weedier than neighboring plots where seeds were not allowed to produce and drop seeds.*

*Photos: Bryan Brown*

# PEST ALERTS

## Alliums

**Downy mildew** was reported on overwintered onions in Maine this week. This pathogen overwinters in crop residue in fields and cull piles, and on overwintered onions. In the spring, under warm, humid conditions, the fungal-like organism produces spores, which are then wind-dispersed and cause infection in new onion fields. Till crop residue under well in the fall to promote breakdown and destroy volunteers from cull piles. Perennial onions, including those in home gardens, are a common source of inoculum. Some broad-spectrum fungicides, including the dithiocarbamates like maneb and mancozeb, will provide protection against downy mildew. Chlorothalonil (Bravo) will not control DM, but the two can be mixed to provide protection against DM as well as other diseases like Botrytis and purple blotch. For organic growers, copper will provide protection.



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

Several **diseases of garlic** have been reported from several New England states in the last few weeks—**Fusarium basal plate rot** and **Botrytis neck rot** are both suspects. Both of these fungi are soil-borne and can remain in the soil in the absence of a host for many years as chlamydospores (*Fusarium*) and sclerotia (*Botrytis*). Both are also spread on infected cloves. Keep an eye out for stunted, yellowing garlic plants, and get suspected plants diagnosed. Avoid introducing diseases into the field by planting clean seed.



*Anthracnose on garlic scapes. Photo: M. McGrath*

**Anthracnose on garlic scapes** was reported in New York this week. This is a relatively new disease in our region and we are interested in learning more about it—let us know if you have had symptoms like this in your garlic! Meg McGrath of Cornell University writes: “This disease only affects garlic scapes and bulbils. Symptoms are sunken lesions that are initially tan, turning orange as the fungal pathogen produces spores when it is humid or rainy, and spores are then rain dispersed. Lesions can be up to an inch long and cause affected scape to twist and become girdled and collapse.”

**Onion thrips** numbers continue to rise with the hot, dry weather. In fields with high populations, silvery feeding damage on leaves should be quite apparent by now, with the insects likely hiding during the day within the neck of the plant. See the article in this issue from Cornell on controlling thrips in organic production systems, and see the [Onion, Shal-lots, and Leeks section](#) of the New England Vegetable Management Guide for a full list of labeled products.

## Basil

Sunburn is still being reported widely on basil. Sunburn can look similar to downy mildew—leaves appear yellow on the top and brown-gray underneath, and dirt that has splashed onto the undersides of leaves can look like sporulation. Plants will grow out of sunburn injury. Contact us if you suspect downy mildew in your basil!

## Brassicas:

**Swede midge** damage is being reported from sites in New England where this pest was not previously known to be present, meaning its range is spreading through VT and NH and will likely be in MA soon if it's not already. The larvae of this tiny fly pest feed on the growing point of brassicas, causing distortion and death of the growing point. Affected plants often develop multiple growing points or no growing point at all. The larvae are difficult to see with the naked eye, and damage is often not noticed until the larvae have dropped to the soil to pupate. If you have symptoms like the ones shown



*Symptoms of swede midge damage: leaf puckering (top) and plant with no growing tip (bottom). Photos: Cornell University*

here in your brassica crops this year, please contact us so that we can track its occurrence in MA. To see more pictures of symptoms, please visit the [Cornell University Swede Midge Information Center website](#).

**Cucurbits:**

**Angular leaf spot** was reported this week on winter squash seedlings in northern NY. This disease is seed-borne and therefore commonly appears on small seedlings. Small water-soaked spots on leaves slowly expand until they are trapped by veins, giving the spots a characteristic angular look. As the spots dry out, the center often collapses, giving them a shot-hole appearance. The bacteria is spread through splashing water; using drip irrigation can reduce the spread. Copper may slow the spread if the disease is caught early.



*Angular leafspot.  
Photo: UMass Vegetable Program*

**Cucurbit downy mildew** was reported in Michigan this week. DM does not overwinter in the Northeast but usually moves up the coast every summer from Florida, where it overwinters. The northernmost report from its move northward this year is in North Carolina. This year, it may also move east to New England from Michigan. No protectant sprays are warranted yet for New England but cucurbit growers should begin to [keep an eye out](#) for this damaging disease and be prepared.

**Squash bugs** are still actively feeding on foliage and laying eggs. Control is warranted when there is more than one egg mass per plant, especially early in the season. In watermelon, a threshold of 1 adult per plant was determined to be effective.

**Squash vine borer** (SVB) numbers continue to increase, with one location in western MA above threshold for crowning cucurbits this week. SVB populations are very location-specific; some farms routinely have issues with this pest, while others never see it, so if you routinely see SVB damage in your field, it's important to trap on your own farm to inform effective spray timing. Weekly trap count thresholds are 5 moths/trap for crowning crops and 12 moths/trap for vining crops. 2-4 weekly applications should be made once the spray threshold is reached. See the [Pumpkin, Squash, and Gourds section of the Guide](#) for labelled products.

Location	SVB
<b>Massachusetts</b>	
Belchertown	-
Deerfield	8
North Easton	21
Westhampton	2
Sharon	1
Leominster	0



*Cucurbit downy mildew sporulating on the underside of a cucumber leaf. Photo: G. Higgins*

**Solanaceous:**

**Colorado potato beetle** larvae are large and causing a lot of damage in some potato and eggplant fields. Targeting small larvae is most effective, since a smaller dose can kill them and their feeding damage will be less. This pest is hard to control, especially organically, and requires a lot of planning and creativity to utilize cultural practices that slow pest establishment and reduce population size. If you have found a management strategy that you feel is working please get in touch with us so we can help spread the word to other growers!

**Sweet Corn:**

**European corn borer** trap counts remain fairly low throughout MA, but some sites in New England are reporting high numbers and we are getting scouting reports of high levels of damage in the field (10-40% damage) warranting sprays in whorl and tassel stage corn. So be sure to scout your

Location	GDD (base 50)	ECB NY	ECB IA	CEW
<b>Western MA</b>				
Sheffield		-	-	-
Whately	800	3	1	0
<b>Central MA</b>				
Bolton	722	0	2	2
Leominster	722	17	2	-
<b>Eastern MA</b>				
Millis	798	0	0	-
Sharon		2	0	-
Seekonk	804	2	0	-
Swansea		6	1	-
- 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				

corn and don't solely rely on trap counts as evidence of what's out there!

**Corn earworm:** a few CEW traps deployed throughout MA and around the region are still catching CEW, at numbers high enough to warrant sprays in silking corn in a few locations. Once CEW has reached threshold on your farm, it usually informs spray schedules for the remainder of the season—see Table 3 for spray intervals. If CEW trap counts do not warrant a spray, continue using ECB scouting results to determine whether or not a spray is warranted.

Moths/Night	Moths/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

For recommendations on what to scout for and thresholds for corn based on crop growth stage, see the article in the [June 20, 2019 issue of Veg Notes](#).

New Hampshire and New York both also monitor sweet corn pests, and report their findings weekly at the links below.

- <https://extension.unh.edu/resource/sweet-corn-ipm-weekly-scouting-reports>
- <http://sweetcorn.nysipm.cornell.edu/>

### Various

**Tarnished plant bug** damage was seen on potatoes this week, causing feeding damage on leaf midribs and causing leaf tips or entire leaves to wilt. They may not be causing significant damage but it might look alarming. The current theory among New England Extension specialists is that in dry years like this one, TPB goes searching for moisture in some uncommon host crops. We more frequently see TPB damage in strawberries and lettuce, but they have a very broad host range and prefer to feed on flowers or growing points. Populations tend to be high in fields nearby weedy fallow fields and alfalfa; keeping field edges mowed can reduce populations. While populations usually don't warrant control in vegetables, if the damage is significant consult the appropriate crop section of the [New England Vegetable Management Guide](#) for chemical management recommendations.



*Adult tarnished plant bug.  
Photo: S. Bauer, USDA*

## SOIL MOISTURE SENSORS: A TOOL FOR SMART IRRIGATION MANAGEMENT DECISIONS

*Written by Jeremy DeLisle, UNH Cooperative Extension Food & Agriculture Field Specialist*

Understanding the effects of rainfall and irrigation events on soil moisture provides critical insight for growers about the present growing environment for their crops. While experienced growers have learned over seasons of observations how their soils and water interact, utilizing a soil moisture measuring device of some sort enables them to put a number on their observations and more accurately track trends over time.

In 2018, UNH Extension began partnering with eight farms in Merrimack and Belknap counties to install soil moisture sensors in a variety of crops including a high-density apple planting, highbush blueberries, field-grown mixed greens, high tunnel tomatoes, field-grown peppers, and Christmas tree seedlings.

Monitoring soil moisture levels on these same farms continued during the 2019 production season, and growers reported that the information they gained as a result of monitoring was very beneficial. Some growers plan to purchase their own set of sensors and accompanying reader once our project concludes.



*Soil Moisture sensors are used to track soil moisture levels for better crop production. Photo: J. DeLisle*

### Grower Feedback

The information that has been gained from a grower's perspective throughout this project has been quite diverse. There were instances where irrigation cycles were occurring too often and for far longer periods than needed to achieve field capacity of the soil. There were also instances where the use of sensors revealed malfunctioning irrigation system compo-

nents by reporting unusually dry soil in areas that should have received ample irrigation.

The sensors have allowed growers to more accurately determine the frequency and duration of irrigation events needed, based on soil moisture trends, and maintain adequate moisture for the crops being grown. On many occasions, information from the sensors resulted in growers waiting an extra day or two to irrigate, avoiding unnecessary irrigation. The goal of this project is to provide growers with a useful tool and information resulting in a higher level of water use efficiency.

### Sensor Types

The sensors used fall into the category of GMS (Granular Matrix Sensors). This category of sensors provides a reading based on the electrical resistance between two electrodes embedded in the granular matrix within the sensor. The more soil moisture available in the soil, the lower the resistance and the corresponding number on the reader. This resistance reading is reported in kilopascals (kPa) or centibars. Both of these readings are equal as a resistance measurement. The specific sensors we are using in our fieldwork are WATERMARK model 200SS.

As an example, a reading of zero would tell us that we have a fully saturated soil, while a reading of fifteen would be somewhat drier. It helps to think about these numbers in the sense of how hard the plant has to work to pull water from the soil.

Another traditional instrument used to measure soil water tension, the tensiometer, is designed to simulate a plant root and provides the same units of measurement as the WATERMARK sensors. The WATERMARK sensors have been calibrated to provide readings based on the format of soil water tension, defined as the force necessary for plant roots to extract water from the soil. Therefore, the readings from both the tensiometer and WATERMARK sensors are easily comparable.

Think for a moment about the implications of how this data could be used by growers to help minimize plant stress or disease caused by excess moisture, or how important adequate moisture is for efficient nutrient uptake by the plants. You can begin to see how the readings provided by these sensors can be utilized to fine tune irrigation management strategies and to better manage the growing environment for specific crops.

### Installation

Proper installation of the WATERMARK sensors can be accomplished in several ways. Here in New Hampshire, we've been closely following the manufacturer's instructions. Simplified, the standard sensors come with a two-wire lead measuring five feet long. This lead is threaded up through a section of PVC pipe of the desired length depending on your intended sensor depth in the field, glued in place with PVC glue, then capped with another section of larger diameter PVC with a cap and slid over the top to keep moisture out of the tube.

Before installing the sensor in the field, there is a recommended wetting and drying process that needs to be followed to ensure the sensors quickly responds to changing moisture conditions. Good soil contact with the sensor is essential to ensure accurate readings.

Follow the manufacturer's instructions to ensure proper installation. Sensors can quickly and easily be moved from one location to another to better understand the dynamics of soil moisture in relation to soil types, irrigation cycles, topographical changes, etc., so long as the installation instructions are followed with each move.

### Interpreting the Readings

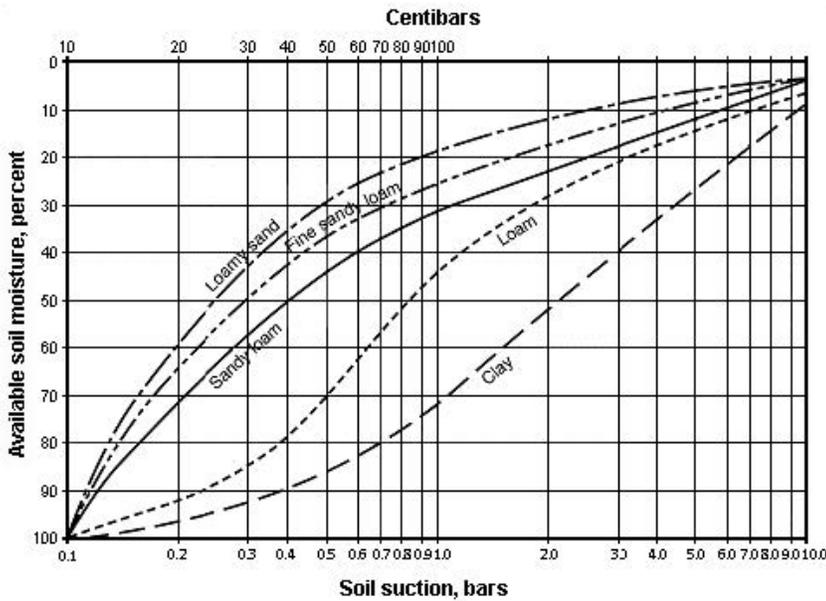
To take readings using these sensors, growers need access to a digital data reader which simply connects with clips to the end of each wire lead. The cost of these readers was \$210 at the time this publication was written. Each sensor costs \$36, and a pair of two is recommended for each location. Having two sensors allows growers to better understand the effects of irrigation at varying depths within a planting or block. Sensor depth can be adjusted depending on the rooting depth of



*A handheld reader provides instant data useful for irrigation management decisions. Photo J. DeLisle*



*Sensor depth can be adjusted depending on the rooting depth of the crop. Photo J. DeLisle*



This chart is used with permission (from the BC Trickle Irrigation Manual, Irrigation Industry Association of British Columbia (T.W. Van der Gulik) and was adapted by R. Shortt, et. al, in the publication Monitoring Soil Moisture to Improve Irrigation Decisions published by the Ontario Ministry of Food and Rural Affairs.

Note: 1kpa = 1 centibar; 100 centibars = 1 bar

the crop.

Established recommendations for soil moisture in specific crops and soil types are available. These recommendations provide growers with additional information on which to base their irrigation decisions. In most soils, other than heavy clay, the decision to irrigate would generally happen with sensor readings in the range of 20 to 40 kPa. Differences in soil type should be considered when determining the appropriate range for irrigation.

This is because different soil types have varying levels of plant-available water at various soil moisture readings. To clarify, a soil moisture tension reading of 40 kPa in a sandy loam would mean that approximately 50 percent of the water in the soil is available to the plant. Comparatively, a loamy sand soil would have only 35 percent plant-available water at the same 40 kPa reading (see chart).

This reinforces the importance of knowing the soil type, along with monitoring soil moisture and visually observing crops and soil to make an informed irrigation decision. Additionally, the

method of irrigation should also be considered.

For example, it is recommended to begin overhead irrigation when the available soil moisture is no less that 50 percent, while drip irrigation, taking comparatively longer to distribute substantial volumes of water, could be started before the plant-available water drops below 80 percent. Using the sandy loam example from above, this would mean that a reading of 17 kPa would trigger a drip irrigation event.

## **BIOINSECTICIDES & CULTURAL CONTROLS FOR ONION THRIPS IN ORGANIC ONIONS**

Written by Lindsay Iglesias and Brian Nault, Cornell Entomology

This article first appeared in the June 17, 2020 issue of the Cornell Vegetable Program's VegEdge newsletter.

Onion thrips is the major insect pest of onions in New York [and New England]. Both adults and larvae feed on the onion foliage causing silver or white scarring on the leaf surface and, in very high infestations, can cause leaves to become completely white and papery. Thrips feeding reduces photosynthesis and can cause bulb yield losses up to 60%. Onion thrips also transmits important pathogens, such as Iris yellow spot virus (IYSV), and their feeding can exacerbate foliar pathogens like *Stemphylium vesicarium*, which causes *Stemphylium* leaf blight.

Adults emerge in late April and early May and colonize weeds and other host crops like small grains and alfalfa. The subsequent generations typically begin colonizing onion plantings in June and July. Onion thrips can reproduce asexually (without mating with males) and have several generations a year. When conditions are hot and dry, onion thrips infestations often increase rapidly. Onion thrips can be found in groups within the neck of onion plant; when populations are very high, they can be found along the length of the onion leaves.

**Conventional Onion Thrips Mgmt:** The most effective management strategy in conventional onion production relies on repeated insecticide applications using action thresholds (1 thrips larvae/leaf) and rotations of different modes of action (<https://irac-online.org/modes-of-action/>). Cornell researchers and Cooperative Extension educators have designed a season-long rotation program of conventional insecticides using action thresholds that can be found at <https://cyp.cce.cornell.edu/submission.php?id=584>.

## Organic Onion Thrips Mgmt:

**Chemical controls:** Organic onion growers have fewer effective insecticides for managing onion thrips than conventional growers. In Cornell field trials in 2018 and 2019, we evaluated several OMRI-Listed bioinsecticides. Entrust (8 fl/oz) provided the best thrips control compared to Neemix 4.5 (16 fl oz), Azera (3.5 pt) and PFR-97 (2 lb) (see Table 1 on the next page). Marketable yield was also higher for onions treated with Entrust compared to all other bioinsecticides. Growers cannot rely exclusively on Entrust because of label restrictions limiting numbers of applications per season as well as a risk of insecticide resistance, so other products need to be considered for use in a sequence. In the same Cornell trials, the bioinsecticides were tank-mixed with three different adjuvants, NuFilm P (8 fl oz), M-Pede (2% v:v), and Trilogy (1% v:v), to see whether their performance could be improved to a level similar to that of Entrust. In both years, Entrust + M-Pede and Entrust + Trilogy provided the best control of onion thrips and both were better than Entrust + NuFilm P. In 2018, Neemix 4.5 + NuFilm P provided similar control to the best combinations. However, in 2019 when onion thrips densities were three times higher, none of the combinations could provide the same level of control as Entrust. None of the different adjuvants improved onion yield.



Figure 1. M-Pede at 2% v:v caused severe phytotoxicity in 2018 and 2019 trials

**What are the best insecticides for organic onion thrips control?** Entrust + Trilogy and Entrust + M-Pede provided excellent control of onion thrips (ratings on Table 1, next page). M-Pede at 2% v:v caused severe phytotoxicity on the leaves, so 1.5% v:v is recommended (Fig. 1). Neemix 4.5 + NuFilm P provided moderate control and could be used in a sequence with Entrust. We are conducting additional trials looking at potential rotations of these products utilizing actions thresholds.

Another potential option, kaolin clay, is a particle film formulated with a spreader sticker that creates a powdery film on the leaf surface. The kaolin product Surround® WP has been shown to reduce rate of egg-laying, thrips feeding, and overall onion thrips densities in onions. Efficacy of kaolin clay is highly dependent on good leaf coverage and may require multiple applications, especially after rain.

## Cultural controls

**Tolerant varieties.** Non-chemical strategies must be considered alone or in combination with chemical controls. Thrips resistance has been shown in onion cultivars that have low accumulations of wax in the leaves (“semi-glossy” or “glossy”) compared to onions with waxy leaves. Yet, the effectiveness of thrips-resistant onions in production is somewhat inconsistent. Cornell trials in organic onions evaluated two “semi-glossy”, thrips-resistant cultivars (cv. ‘Rossa di Milano’ and B5336 x B5351) against a waxy, susceptible cultivar (cv. ‘Bradley’). In both years, ‘Rossa di Milano’ had lower thrips densities than ‘Bradley’, whereas B5336 x B5351 had lower thrips densities than ‘Bradley’ in 2018 only (Fig. 2). Although bacterial bulb rot was not different among the cultivars, some semi-glossy, thrips-resistant cultivars (cv. ‘Avalon’) have been shown to have higher rate of bulb rots as well as higher levels of Stemphylium leaf blight. Thrips-resistant onions will not be a silver-bullet for onion thrips control, but they can delay or reduce thrips densities enough that fewer insecticide applications are needed during the season for similar control.

**Silver reflective mulch.** It is not uncommon for organic and small-scale growers to plant onions in raised beds with plastic mulch to control weeds and moderate soil conditions. Silver mulches are used in vegetable production to repel or delay infestation by insects such

## 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 *We are currently working remotely but checking these messages daily, so please leave us a message!*

**Email:** [umassveg@umass.edu](mailto:umassveg@umass.edu)

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

## UMass Extension Services Suspension

The following on-campus services are suspended until further notice, due to the COVID-19 pandemic: Soil & Plant Nutrient Testing, Hot Water Seed Treatment, Nematode Analysis, Weed, Insect, Turf-grass, and Invasive Plant Identification, Public access to all farm properties.

**The UMass Plant Diagnostic Lab is now open! See the News section in this issue for more information.**

as aphids, whiteflies, and thrips. Cornell trials that evaluated silver and white-on-black plastic mulches against onion thrips saw a slight reduction in onion thrips on onions in silver mulch in one year only (Fig. 2). The reduction in thrips densities in silver mulch did not affect marketable yield. Although thrips control by silver mulches may be inconsistent, they can reduce bacterial bulb rots and have shown to increase yield of larger bulbs and net yields compared to standard black plastic mulches.

**Planting early.** Onion thrips are most damaging when they feed during the early bulbing stage so protecting onions is crucial during this time. Planting onions as early as possible when thrips are low as well as planting early-maturing cultivars, can reduce the time that onions are exposed to thrips. Onion plants are also larger later in the season when thrips populations are at their peak, so plants can withstand more injury without reducing yield. Early planting and early harvesting also reduces risk of disease.

**Row covers.** Row covers made of fine mesh can exclude onion thrips from feeding on onion plants. Apply row covers to thrips-free plants. Row covers can remain while the onion plants are young and most vulnerable to thrips damage, but should be removed as temperatures begin to rise to prevent overheating.

## KEY FINDINGS

Treatment	Onion thrips larvae/leaf		Yield (tons/ha)		Rating <sup>1</sup>
	2018	2019	2018	2019	
<b>Bioinsecticide</b>					
Entrust	3.8b	3.8b	6.6a	6.8a	E
Neemix 4.5	4.8a	13.4a	5.6b	5.8ab	P
PFR-97	5.0a	14.9a	5.4b	4.9b	F
Azera	5.5a	12.3a	5.3b	5.5b	F
<b>Bioinsecticide + Adjuvant</b>					
Entrust + Trilogy	3.7ab	3.4d	18.5ab	6.5ab	E
Entrust + M-Pede	3.2b	2.7d	21.2a	6.4ab	E
Entrust + NuFilm	4.5ab	5.3c	20.3a	7.5a	VG
Neemix + Trilogy	5.2a	12.2b	17.4ab	5.3ab	P
Neemix + M-Pede	5.2a	13.9ab	17.6ab	6.0ab	P
Neemix + NuFilm	3.9ab	14.2ab	16.2ab	5.9ab	M
Azera + Trilogy	5.4a	11.5b	16.0b	5.1ab	F
Azera + M-Pede	5.6a	12.8ab	15.7b	5.4ab	F
Azera + NuFilm	5.6a	12.6ab	18.1ab	6.1ab	F
PFR 97 + Trilogy	5.4a	16.2a	17.9ab	5.2ab	F
PFR 97 + M-Pede	5.2a	13.9ab	14.8b	5.0ab	F
PFR 97 + NuFilm	4.4ab	14.6ab	16.3ab	4.6b	F
Untreated	5.2a	16.4a	17.7ab	5.1ab	F
<sup>1</sup> Ratings: E = Excellent, VG = Very good, M = Moderate, P = Poor, F = Fail					
Within a column, treatments that share one or more letters in common are not significantly different.					

- Entrust + Trilogy and Entrust + M-Pede provided excellent onion thrips control. M-Pede should be applied at 1.5% v:v to minimize risk of phytotoxicity.
- Neemix 4.5 + NuFilm provided moderate control and could be used when thrips densities are low, saving Entrust for when densities are higher.
- Thrips-resistant onion cultivars are inconsistent in reducing thrips densities. ‘Rossa di Milano’ was best, B5336 x B5351 was inconsistent, ‘Avalon’ had lower thrips densities, but higher incidence of bacterial bulb rot and Stemphylium leaf blight.

- Silver reflective mulch was inconsistent against thrips densities, but can reduce bulb rots compared to black mulch.
- Plant early and plant early-maturing cultivars to reduce exposure to thrips and risk of disease.
- Apply fine mesh row covers while plants are young and most vulnerable to thrips damage.

Organic onion thrips management will require multiple tactics for successful control. All insecticides used in USDA Certified organic production must be approved by the Organic Materials Review Institute (OMRI). Search for approved products at <https://www.omri.org/>.

## **SHORT-TERM SUMMER COVER CROPS**

Bare soil is subject to erosion from wind and rain, and to weeds going to seed. Shade produced by a thick cover crop in the summer can keep weed seedheads from forming. There are several good legume and non-legume cover crop choices for planting now and through July that grow rapidly in the summer heat. When planting mixtures in the summer, select equally vigorous crops (similar height and growth rate) so they will not compete and shade each other out. For example, Jean-Paul Cortens, a New York farmer, likes a mix of 50 lbs/A sunn hemp, 10 lbs/A Japanese millet, 5 lbs/A sunflower, and 50 lbs/A cowpea or field pea.

### ***Legumes***

**Cowpea** (*Vigna unguiculata*), also known as black-eyed or southern pea, is fast-growing with peak biomass often reached in 60 days. It also tolerates drought and heat. Cowpeas can fix up to 100 lbs N/A with biomass of 3000-4000 lbs/A. It breaks down rapidly after incorporation. Cowpeas also can be harvested in the immature pod stage as a fresh legume. *Drill at 40-50 lbs/A and broadcast at 70-100 lbs/A.*

**Sunn Hemp** (*Crotalaria juncea*): This tropical legume (not related to other hems) has great potential in our humid, tropic-feeling summers. Sunn hemp can produce very high amounts of biomass (3-4 tons/A in MA). It is a high nitrogen-fixing legume and can contribute over 100 lbs N/A to a following crop. Sunn hemp grows very fast in the summer, reaching 6 feet or taller in 8 weeks. Allow sunn hemp to grow 1-3 feet tall, then mow it and let it regrow. If allowed to get too tall, the stems will become tough and fibrous and will not decompose rapidly. This crop is an excellent companion for sorghum sudangrass, which can also be mowed to keep it from getting too fibrous. Sunn hemp is a day length-sensitive crop; it will grow anytime during the summer, however it will not flower and go to seed until the days start getting shorter in very late summer. Seed is mostly sourced from Hawaii at this point and may be expensive, but the N contributions may be worth it! *Drill 20-30 lbs/A.*

**Crimson Clover** (*Trifolium incarnatum*) is a beautiful cover crop that is a great choice for a short-term summer cover or perhaps seeded between plastic rows to reduce splash and erosion and suppress weeds. It is not typically considered an overwintering cover crop in Massachusetts, but in a cover crop research trial conducted by the UMass Extension Vegetable Program in 2016, it overwintered well on four MA farms. It is fairly resilient and tolerates well-drained soils, heat, drought, and low fertility soils. Shade tolerance makes this cover crop a good choice for mixes. Depending on coverage, it can fix 70-150 lbs N/A. *Drill 10-20 lbs/A, and broadcast at 12-24 lbs/A.*

### ***Non Legumes***

**Sorghum Sudangrass** (*Sorghum bicolor x S. sudanense*) Sorghum sudangrass is a cross between grain sorghum and sudangrass. It is a warm-season annual grass that grows well in hot conditions and produces a large amount of biomass. Its thick root system and high biomass makes it useful for soil building. Sorghum sudangrass can reach 6-12 feet tall, but should be mowed when it reaches 2-3 feet tall to prevent it from becoming fibrous and difficult to manage. Mowing also encourages root growth. Unmowed sorghum sudangrass will winterkill but the tough residue can be difficult to manage in the spring. Brown midrib types will decompose more quickly because they have less lignin. Expect 3-4 tons of biomass addition per acre in MA. Because it is a grass, to get the most growth you will need to add nitrogen fertilizer (40-80 lbs/A), which will be cycled on to the next crop. Sorghum sudangrass is very effective at suppressing weeds and has been shown to have allelopathic and biofumigant properties useful for nematode management. *Drill 35-40 lbs/A or 40-50 lbs/A broadcast.*

**Phacelia** (*Phacelia tanacetifolia*), also known as blue or purple tansy, is a good cover crop for use in rotation on vegetable farms because it is in a different plant family than most vegetable crops. This fast-growing cover crop is best to seed in mid-summer. While it does not have a deep taproot, phacelia is a wonderful soil aggregator in the top 2 inches.

Beneficial insects including parasitoids, bees, and pollinators are attracted by the fuzzy blue/purple flowers. This cover crop will winterkill at 15°F. *Seed at 1lb/A drilled and 3 lb/A broadcast.*

**Forage-Type Pearl Millet** (*Pennisetum glaucum*) or **Japanese Millet** (*Echinochloa* spp.) have similar functions as a summer cover crops: they grow rapidly but are more easy to manage than sorghum sudangrass. They also produce less biomass than sorghum sudangrass. Both millets grow about 4-6 feet tall and have similar seeding rates. They are well-adapted to sandy and/or infertile soils and do well in the summer heat. Forage types are better adapted for soil improvement than grain types. To get the most growth, you will need to add nitrogen fertilizer (40-80 lbs/A). Pearl millet has been shown to suppress some nematodes. Forage pearl millet can make a good mulch for late-summer plantings of no-till or strip-till crops. *Seed at 12-15 lbs/A drilled or 15-20 lbs/A broadcast.*

**Buckwheat** (*Fagopyrum esculentum*): If weed suppression is your main goal, buckwheat is a good choice. It can be sown as early as May 20, but will put on more growth if seeded in June. As a broadleaf plant, it covers the ground earlier than grass cover crops, and out-competes weeds. A good stand of buckwheat attracts beneficial insects, improves soil tilth, and produces more biomass than any other cover crop in the short time it grows, but doesn't do well if the plow layer is compacted. It scavenges phosphorus from soil and makes it available to subsequent crops. Buckwheat does well even in low nitrogen or low phosphorous soils, without additional fertilizer. Buckwheat decomposes quickly after incorporation. Mow or incorporate when the planting begins flowering to avoid seed production and volunteers. *Drill at 50 lbs/A or broadcast at 70 lbs/A.*

### Additional Information

- [Summer Soil Improving Crops for Vegetable Rotations](#), Gordon Johnson, Extension Vegetable and Fruit Specialist, University of Delaware.
- [Cover Crop Guide for New York Vegetable Growers](#). From Cornell Cooperative Extension. This site includes cover crop profiles as well as a cover crop decision tool, where you can get crop recommendations based on your management goal, planting time, and cover crop duration.
- [Cover Crops: What a Difference a Few Weeks Makes!](#) Results from Cornell Organic Cropping Systems Trials.
- [Cover Crop Periodic Table](#)

--UMass Extension Vegetable Program

## NEWS

### UMASS DIAGNOSTIC LAB AND SOIL TESTING LAB RE-OPENING INFORMATION

The UMass Plant Diagnostic Laboratory has reopened for plant disease, insect pest and invasive plant/weed samples. At this time, we can only accept mail-in samples, walk-in samples cannot be accepted. Please refer to our website for instructions on sample submission and to access the submission form: <https://ag.umass.edu/services/plant-diagnostics-laboratory>. Mail delivery services and staffing have been altered due to the pandemic, so please allow for some additional time for samples to arrive at the lab and undergo the diagnostic process. We look forward to resuming activities and diagnosing your plant problems!

The UMass Soil & Plant Nutrient Testing Lab will reopen on June 23, 2020, in order to analyze samples that were in process when the lab closed on March 16 and those that arrived after that date. Orders will be processed in the order they were received. Please be aware that we will not be accepting new samples for analysis until the backlog of orders is significantly reduced. **Please do not send soil or plant samples for nutrient analysis until we are able to accept new orders.** For updates and information about available services, please visit: <https://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory>.

### NOTE ON CORONAVIRUS FOOD ASSISTANCE PROGRAM (CFAP) FOR VEGETABLE GROWERS

The applicability of the Coronavirus Food Assistance Program (CFAP) is very limited for vegetable producers. However, producers of the following crops may be eligible for a payment if they marketed any of the following crops between January 15, 2020 through April 15, 2020 (payment rates per pound are in parentheses):

- Cabbage (4 cents)

- Carrots (2 cents)
- Onions (1 cent)
- Squash (72 cents)

There also may be some other limited cases in which a vegetable producer could qualify for a CFAP payment. Interested producers are encouraged to contact their county USDA-Farm Service Agency (FSA) Office that serves their farming operation. [Click here to go to the FSA county offices directory.](#)

## **MA FOOD SECURITY INFRASTRUCTURE GRANT PROGRAM ANNOUNCED**

The Commonwealth of Massachusetts has launched a grant program to support farms and other food businesses and institutions that have been affected by the COVID-19 crisis. [The RFR](#) has a long list of examples of the kinds of projects that are eligible, and broadly states: “Projects will support the immediate and projected needs of the Commonwealth’s local food system, including (i) information technology needs; (ii) facility adaptation to new safety guidelines; (iii) storage, processing, and delivery equipment to adapt to supply chain disruptions and to serve food insecure residents, and (iv) other strategies that connect local food production with food insecure communities and residents and increase food equity for all residents.”

The full application and instructions are available [here](#). Some key details:

- Projects will be funded on a rolling basis through September 15.
- Funding is available for a range of sized projects, from very small to as much as \$500,000.
- Applicants may submit up to three proposals.
- Evaluation criteria include demonstrated evidence of impact and need, a commitment to equity, sustainability and scalability of the project, and other factors.
- Funding is on a reimbursement basis, so funds will be distributed only after costs have been incurred and receipts submitted.
- Funding is for capital infrastructure and equipment purchased must be new.
- Funding may not be spent on labor or food.
- There is no match requirement.

More information about this program is available here: <https://www.mass.gov/service-details/food-security-infrastructure-grant-program>.

## **NOTICE OF OPPORTUNITY TO ADD NEW HIP FARMS - RESPONSES DUE JULY 1**

The Department of Transitional Assistance has released a Notice of Opportunity to strategically onboard new agricultural vendors and access points for the Healthy Incentives Program (HIP). This opportunity is available to both new and existing HIP vendors. All interested farmers must apply regardless of whether or not you have contacted either DTA or MDAR in the past. Applicants will be evaluated on the ability to respond to the needs of communities and populations impacted by COVID-19, establish HIP access points in areas with limited existing HIP access points or other food access barriers, distribute food in ways that limit the transmission of the novel coronavirus while reaching vulnerable populations, and a demonstrated capacity and commitment to serve SNAP clients in culturally appropriate ways. To find out more about the HIP Notice of Opportunity, please use the following link: [www.mass.gov/healthy-incentives-program-hip-notice-of-opportunity-noo](http://www.mass.gov/healthy-incentives-program-hip-notice-of-opportunity-noo).

# **EVENTS**

## **UNH WEBINAR: DISEASE MANAGEMENT FOR GIANT PUMPKIN GROWERS**

**When:** Tuesday, July 7, 2020, 6-8pm

**Registration:** <https://extension.unh.edu/events/disease-management-webinar-giant-pumpkin-growers>

University of New Hampshire Extension is hosting a webinar on disease management for giant pumpkin growers. Dr. Margaret T. McGrath (Associate Professor, Cornell University, Department of Plant, Pathology) will join for a zoom webinar to discuss cucurbit yellow vine decline (CYVD) affecting pumpkin. This webinar will cover how to identify and manage this disease within your IPM system.

Dr. Anna Wallingford (UNH) will discuss the biology and management of squash bug, which vectors the pathogen responsible for the disease.

While this webinar was designed with giant pumpkin growers in mind, this webinar is open to all and may be of interest to any grower of pumpkins, squashes, and gourds. (2 PACs pending, must attend the live event to earn credit).

## **NATIONAL YOUNG FARMER COALITION PRODUCE SAFETY FOCUS GROUPS**

Throughout the summer the National Young Farmer Coalition will be hosting a series of focus groups with farmers to discuss on-farm produce safety practices and how they can be integrated into farming operations. They have some coming up that are specific to CSA farmers, specifically, Produce Safety for CSA/Farmshare Distribution during COVID-19 and Produce Safety for Multi-farm/Aggregated CSAs during COVID-19, one around Produce Safety for Hydroponic and Aquaponic Operation and one about rotational grazing (soon to be added!).

More information and signups can be found on their website: [youngfarmers.org/focusgroups](http://youngfarmers.org/focusgroups). Each focus group will be one hour long, via Zoom, and all farmers will be compensated for their time and energy and receive a copy of their food safety guidebook: [A Small Farmer's Practical Guide to Food Safety](#).

## **PESTICIDE APPLICATOR TRAINING WORKSHOPS AVAILABLE ONLINE**

The 2020 Pesticide Recertification workshops scheduled for this spring were rescheduled due to concerns about the spread of COVID-19. These workshops have been converted to a remote/online format so that everyone can obtain information and continuing education contact hours in a safe manner. You can now register for our online Zoom workshops. Workshop registration fee is \$40/person/workshop by credit or \$10 discount if paid by check. To see the whole list of workshops offered, go to: [https://www.umass.edu/pested/recertification/current\\_workshops.htm](https://www.umass.edu/pested/recertification/current_workshops.htm)

## **MINI-TWILIGHT MEETINGS FOR COMMERCIAL VEGETABLE GROWERS**

This series of virtual twilight meetings is completed, but each meeting was recorded and is available to watch at any time! See links below.

We are busy planning a late-summer series of webinars, so stay tuned!

### **Recordings of Calls:**

- April 22: [Early-season pest scouting](#)
- April 29: [COVID-19 business relief programs](#)
- May 6: [Organic pest management](#)
- May 27: [Cleaning, Sanitizing, & Disinfecting on the Farm: COVID-19 and Beyond](#)
- June 10: [Greenhouse Fertigation with Judson Reid of Cornell Cooperative Extension](#)
- June 24: [Vegetable Weed Management Using IPM with Bryan Brown, NY State IPM Program](#)

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*Vegetable Notes. Genevieve Higgins, Lisa McKeag, Susan Scheufele, co-editors.*

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