UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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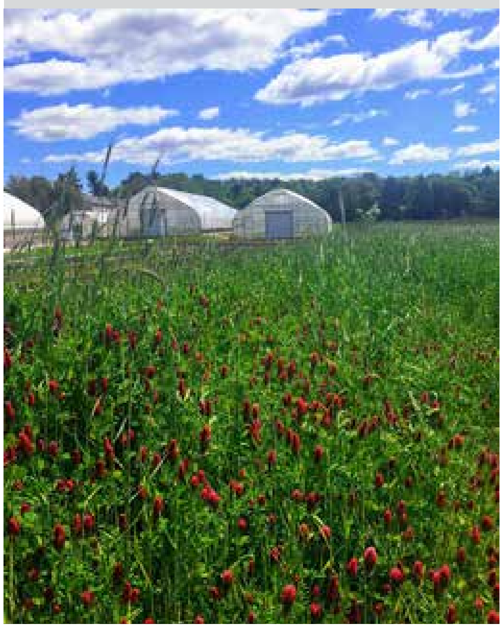


Clouds were trucking across the sky on this blustery day at Tangerini farm. Crimson clover, rye and vetch in the foreground. Photo: K. Campbell-Nelson

Crop conditions

The silver lining to a late start this spring has been that cover crops had extra time to grow for your benefit. We have seen beautiful stands of crimson clover, rye, vetch, and even some spring mustard for biofumigation. Tilling these cover crops under later in the spring means that more nitrogen credits can be expected from the legumes in the mix. See the article in this issue about results from six on-farm trials conducted in the last few years around MA to get an idea about how N release rates from cover crops will match the uptake needs of you vegetable crops this summer.

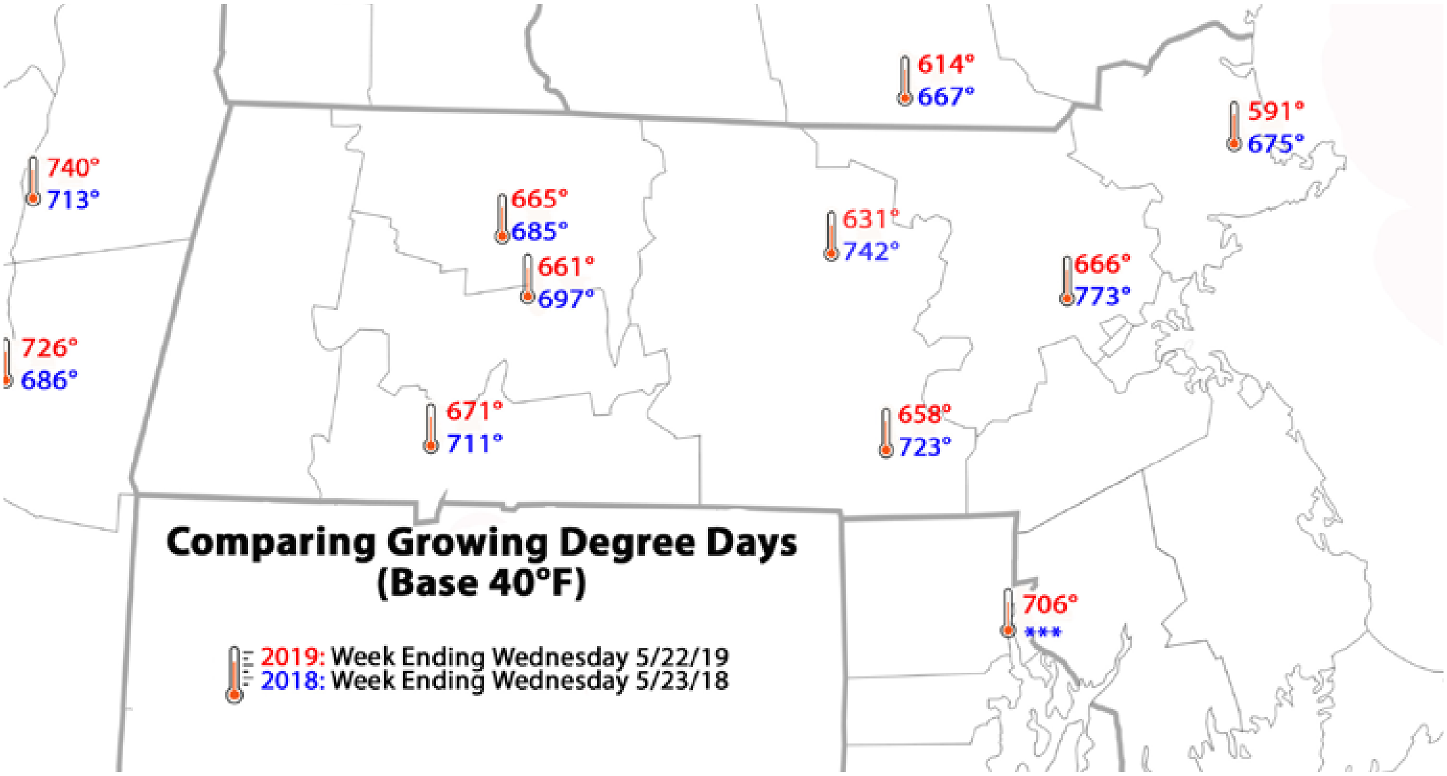
Growing degree days (Base 40°F) vary widely across the state, and some areas are only 20 GDD behind last year and other areas are >100 GDD behind compared to last year (see map next page). Later plantings and slow crop growth observed across the state has more to do with the record amounts of rain (and associated cloud cover) that we experienced to date this year, rather than a significant difference in temperature.

Planting strategies that require less tillage have become more common in recent springs, as rainfall continues to increase. We've seen no-till onions planted into heavy mulch applied early (March) to ground with winterkilled oats and peas. We've seen strip (zone) tillage of rye cover done early so that the rye doesn't get too tall to manage, but then the cover is left to grow between rows to achieve better mulch (photo). We've seen early-season sweet corn planted no-till into fields too wet to till—cold soils are the trade off in this case, but better cold soils than a stuck tractor!

Zone till into standing rye to prepare a seeding bed for pumpkin at Ward's Berry Farm. The rye will be terminated later, at seeding, to provide mulch. photo: K. Campbell-Nelson

With crops sitting in the soil for long periods of slow growth, and lots of rainfall, some are worried about their early season herbicide applications not performing well. In one field with sweet corn planted a month ago and herbicide applied within days of seeding, Sandea, Zidua, and Dual Magnum are providing good control.

The row cover game has been strong this spring! Take it off, cultivate, then, wonder if it's time to leave the cover off. Well, if cabbage maggot is what you're worried about, the first adult flight is over, so you can leave your row covers off, but if flea beetles, cabbageworms, or leaf miner are what you're worried about, keep those covers on.



Data from [NEWA Growing Degree Day Calculator.](#) *Figure by Colin Radon, UMass Extension Vegetable Scout.*

PEST ALERTS

Alliums

Onion thrips: The first thrips of the season were observed in Norfolk Co. on onions that were overwintered in low tunnels. Thrips numbers were well below the threshold of one thrip per leaf but populations can increase quickly with warm sunny weather. No thrips were found in fields scouted in Western MA.

Basil

Basil Downy Mildew has been reported in RI already this spring, so inoculum may be spreading around.

Brassica

Cabbage Root Maggot: Peak flight at (697 GDD Base 40°F) is mostly over, eggs have been laid and are being seen in brassica fields across the state, and damage will begin soon. In fact, the first maggots were found in a warm, well drained field of kale and radishes in Norfolk Co., MA. Radiant and Entrust SC are labeled for soil drench applications after planting and can be applied now to the base of leafy brassicas and are labeled for leafy brassicas only (e.g. not root crops like turnips or radishes). Treat if more than 10% of plants are infested with eggs. There is no longer a need to treat transplants going out into the field now since the first flight is over.

Flea beetle: Some fields we scouted were over the threshold of 1 beetle per plant or 10% average leaf damage, but not others, depending on the history of the field. There are high levels of flea beetle activity being reported to the south of us in RI and CT.

Imported cabbageworm: Butterflies are actively flying around brassica fields now and egg-laying has begun. Keep an eye on uncovered brassicas where eggs will begin to hatch in about a week. The threshold for young seedlings is 35% of plants infested. For control options see the New England Vegetable Management Guide.

left to right: eggs of diamondback moth, imported cabbage worm, and cabbage looper. photo: NCState IPM

Potato

A few samples of seed potato tubers, coming from different seed suppliers, have been submitted to the UMass Plant Diagnostic Lab this spring with a variety of ailments including: soft-rotting bacteria, black heart (a physiological disorder indicating anaerobic growing or storage conditions), Fusarium dry rot, chilling injury, and physical damage like bruising. We encourage folks to reject seed lots that don't look right, and to submit samples if they suspect disease and/or want documentation of seed defects.

Blackheart in Silverton potato diagnosed at the UMass Plant Diagnostic Lab. photo: A. Madeiras

Tomato

Across the region, high tunnel tomatoes have been diagnosed with many pest issues related to the cool and gray weather this spring. Leaf mold and Gray mold are being reported across the region, as well as damping off and Rhizoctonia root rot, and even ant feeding on roots. With the warmer weather and some more sun, crops should grow out of this damage. Decreasing soil moisture and leaf wetness, and increasing air flow should also help with these diseases.

Spinach, Beets, Chard

Leafminers: The very first eggs of the leafminer were found in a field in Norfolk Co., MA. To our south, eggs have already hatched and maggots are causing extensive damage to crops in RI. Treat at the first sign of eggs in a crop.

Sweet Corn

European corn borer: No activity has been observed yet but growers should be putting out their traps now if they haven't done so already, as emergence of ECB adult moths is expected at 374 GDD Base 50°F.

Leafminers on Spinach, Swiss Chard, and Beets

Spinach and beet leafminers are early-season pests that cause damage to early greens. These pests attack crops and weeds in the plant family *Chenopodiaceae*, which includes chard, beets, and spinach as well as lamb's quarters. The two fly species are very similar, however, spinach leafminer may also cause damage in Solanaceous crops such as peppers.

Crop damage is caused by the fly larva that burrows and feeds between the upper and lower epidermis of the leaf. Early damage is a slender, winding 'mine' or tunnel, but as the larva feeds and grows these expand and become blotches on the leaves. The fly overwinters as a pupa in the soil and emerges in late-April and May. The adult fly—a small, gray fly 5-7 mm long—lays eggs on the undersides of host leaves. The small (<1mm), oblong, white eggs, are laid in neat clusters on the underside of the leaves. They are easy to spot if you look under the leaves. If you find tunnels, pulling the epidermis off will reveal one or several pale, white maggots. When fully grown, maggots usually drop into the soil to pupate, though they may also pupate inside the leaf. The entire life cycle is 30-40 days and there are three to four generations per season. Typically mid- to late-May, late-June and mid-August are peak activity periods. After August, pupae enter the overwintering phase and won't emerge until next spring.

Top to bottom: Spinach leafminer adult, eggs, and larvae. Photos: UMass Vegetable Program

If the plants are infested early and populations are high, losses from this pest may be great. This may be especially true when eggs on transplants in the greenhouse go unnoticed until planting in the field, resulting in infestations in row-covered crops. Treat when eggs or first tiny tunnels are noticed—see current recommendations below. There are both conventional and organic products available and in both cases an adjuvant is recommended to improve efficacy. See New England Vegetable Management Guide for more details on products. Many products are labeled for leafy greens including spinach and Swiss chard but not for beets so, as always, check the labels.

Some systemic insecticides are registered and may be applied to transplants or to the soil, including the diamides (e.g. Coragen, Verimark) and neonicotinoids (e.g. Venom, Platinum)—be sure to observe the longer days to harvest restrictions for these materials. Most of the products labeled are for foliar applications. Among the organic products available, spinosad has demonstrated efficacy when applied before egg hatch. Spinosad also has some translaminar activity, particularly when combined with a penetrating adjuvant, and may be effective against larvae in leaf mines.

Because leafminer feeds mostly on one crop family and also on many weeds including chickweed, lamb's quarters and nightshades, weed control and crop rotation are the first line of defense. Row covers can also be used to exclude flies if placed over the crop before flies are active or immediately after planting, though be sure not to cover crops in fields where susceptible crops were grown previously and where adult flies may be emerging, as they will get trapped under the row cover.

-Updated by UMass Vegetable Program, 2019 from an article by Eric Sideman, Maine Organic Farmers and Gardeners Association

Diseases of Onion

Onions and garlic are subject to numerous leaf and bulb diseases caused by fungi and bacteria which occur both in the field and in storage. While it might seem early to be thinking about diseases in your onions, all of them can overwinter in crop residues and cull piles and return year after year, and they cause losses in storage not just damage in the field. If you are the modeling sort, there is a NEWA onion disease forecast tool which can help you determine whether conditions are favorable for disease and if a fungicide spray is warranted, check it out!

Early symptoms of Botrytis leaf blight -- small white to gray oval spots on leaves. Photo: L. du Toit.

Fungal Diseases

Botrytis Leaf Blight (*Botrytis squamosa*) overwinters in onion cull piles, on onion leaf debris, or as sclerotia (small masses of fungal tissue that survive long-term in soil). Infection occurs under favorable conditions—leaf wetness and moderate temperatures (72-75˚F)—and spores are produced on leaf tissue and are then spread by wind. Disease incidence increases with longer periods of leaf wetness. Early symptoms are small, gray to white oval spots on leaves. The spots have a distinctive silvery-white "halo" with uneven margins. The centers of many spots become sunken and straw-colored. Eventually the whole leaf may be covered in spots and the leaf will die back. Older or dying leaves are more susceptible to blight. Yield losses occur because premature leaf senescence prevents bulbs from sizing up.

Purple blotch lesions develop concentric rings as they develop. Photo: S.B. Scheufele.

Purple Blotch (*Alternaria porri)* has been reported on onion, garlic, and leek and probably occurs on other Allium species as well. The pathogen overwinters on infected bulbs and debris in the field, and can be seed-borne in onion. Symptoms first appear on leaves as small water-soaked lesions with white centers. Growing lesions develop concentric rings, with surrounding tissue turning yellow and lesion centers appearing brown to purple. In moist weather, the surfaces of the spots usually develop a brown-black, powdery fungal growth. Leaves with large spots turn yellow and die. Leaves with wounds from thrips feeding injury or abrasions from sandblasting that can occur during windstorms are more susceptible to purple blotch. Older leaves and older plants are more susceptible than young plants. Spores require rain or persistent dew to cause infection. Optimum temperatures are 77 to 81°F—almost no infection occurs below 55°F. The pathogen may enter bulbs at harvest through the neck or wounds. Bulb decay first appears as a watery rot around the neck and is particularly noticeable because of the yellowish to wine-red discoloration in the neck region. As the fungus moves through onion scales, the tissue turns yellow then wine-red and dries to a papery texture.

Downy mildew of onions, shallots, leeks, garlic, and chives is caused by the air-borne oomycete *Peronospora destructor.* This disease is not as common as Botrytis leaf blight or purple blotch, but when conditions are favorable for downy mildew, it can destroy an onion crop very quickly. The first symptoms are irregular pale green or yellow patches on the leaf. Later the pathogen produces spores which start out clear and then become gray to purplish, and can resemble purple blotch. The lesions girdle onion leaves and they often become bent at the yellowed spot. Disease often starts in patches in a field or in a certain variety and is favored by cool (less than 72°F), humid weather. The pathogen overwinters as mycelium in crop debris or cull piles and spreads when conditions are favorable. Because the pathogen is an oomycete and not a true fungus, fungicides that control Botrytis or purple blotch may not control downy mildew.

Onion downy mildew lesions develop dark sporulation like purple blotch, but lack concentric rings. Photo: K. Campbell-Nelson

White Rot (*Sclerotium cepivorum*) is one of the most widespread and destructive fungal diseases of Allium species. This disease occurs wherever onions are grown, especially when a significant part of crop growth occurs during cool temperatures, which favors the pathogen. Sclerotium cepivorum produces sclerotia—small masses of fungal tissue, surrounded by a dark rind—that persist in the soil for years. Disease is spread by movement of infested soil and infected sets or transplants. Symptoms include leaf yellowing and premature leaf dieback. Plants become stunted, and rapid death of all foliage follows. In fields with bad infestations, plants may die suddenly in large areas. Infected plants will develop fluffy fungal mycelium on the stem plate, and small sclerotia (about the size of poppy seeds) will form in and on the surface of affected bulb parts, often around the neck. White rot can continue to spread in storage if humidity is not kept low. Note that the closely related Sclerotinia sclerotiorum and S. minor have also been reported to cause white mold in Allium. They have broad host range including tomato, lettuce, cabbage, carrot and bean while S. cepivorum is specific to alliums.

Fluffy white fungal growth characteristic of white rot. Photo by G.Q. Pelter

Fusarium Basal Rot affects Allium species including onion, garlic, shallot, and chives. This disease is primarily caused by Fusarium oxysporum f. sp. cepae. The fungus produces long-lived survival spores that can persist in the soil for many years, and can be spread on infected onion sets and garlic cloves. Plants can be infected at any stage of growth. Disease incidence increases with injury to roots, basal plate, or bulbs by onion maggots and other insects. Above-ground symptoms of root infections include leaf yellowing and curving. Leaves will begin to die back from the tip downwards. Infected plants may wilt, and affected bulbs may turn red to purple and appear brown and watery when cut open. This disease progresses from the stem plate up to storage leaves and the roots will eventually rot. Bulbs may exhibit no disease at harvest, but subsequently decay in storage. The most effective methods of control is using resistant varieties and planting only healthy onion sets/garlic bulbs.

Wilting and foliar dieback, caused by Fusarium basal rot (above). Bases of bulbs appear purple-brown and watery when cut open (below). Photos by H. Schwartz

Bacterial Diseases

Bacterial diseases occur when bacterial cells enter leaf tissue via wounds caused by thrips damage, sandblasting by wind, or during harvest. Bacteria move into the bulb and are often not evident until the harvested crop is stored and used. Therefore, controlling onion thrips is very important, especially in storage onions, as their feeding damage can be an entry point for these pathogens. Control measures should include proper maturing of the crop, rapid drying after harvest, topping only after necks have dried fully, and proper storage at 32-34°F.

Slippery skin is a bacterial disease caused by *Pseudomonas gladioli pv. alliicola.* In the early stages of the disease, affected bulbs may show no external symptoms except softening of neck tissue. If the bulb is cut longitudinally, inner scales are soft and water-soaked. The rot progresses from the top of the infected scales downward and eventually the whole bulb may rot. The bacterium enters via wounded leaf tissue and attacks leaves and bulbs in the field just before or at harvest time. Mature bulbs are very susceptible.

Symptoms of slippery skin. Photo by H. Schwartz

Sourskin (*Burkholderia cepacia – previously Pseudomonas cepacia)* causes light brown decay and breakdown of one or a few inner bulb scales. The bulbs appear intact and remain firm, but rot proceeds internally. The bacterium is a versatile organism, found in soil and water or as a pathogen of plants and/or animals, and is favored by high temperatures. Onions are relatively resistant to infection before bulb formation.

Sourskin causes individual bulb scales to rot. Photo by D.B. Langston

Disease Management

- Practice long rotations with non-allium crops. Plant alliums into disease-free soil.
- Plant high quality onion seed, slips, and transplants free of contamination.
- Use resistant varieties where available (look for resistance to Fusarium diseases and Purple Blotch).
- Control weeds.
- Control onion thrips. Conventional and organic insecticides are available. See the New England Vegetable Management Guide for recommendations.
- Conventional and organic fungicides can be effective in controlling ***Botrytis*,** purple blotch, and downy mildew. See the New England Vegetable Management Guide for the latest recommendations.
- Destroy onion debris after harvest.
- Sanitize harvest tools regularly to prevent spreading bacteria.
- Closer in-row spacing (4” instead of 6” or 8”) has been shown in trials to reduce incidence of bacterial bulb decay at harvest, but may increase leaf wetness and risk of fungal diseases.
- Avoid excess (greater than 200 pounds per acre) or late (after July 15) applications of nitrogen. Split nitrogen applications are recommended.
- Avoid moving contaminated soil between fields. Clean tractors and equipment between fields.
- Do not irrigate within 10 to 14 days of harvest. Avoid harvest after heavy rains.
- Avoid mechanical injury and bruising of bulbs during production and harvest.
- Undercut crop prior to harvest to sever all roots and prevent larger wounding during harvest.
- Cure in a well-ventilated area at 70-80˚F. Under wet conditions when bulbs cannot be cured adequately, artificial drying with forced hot air followed by normal storage should be considered.
- Store bulbs with good ventilation at 32-34˚F with 70-75% relative humidity. Regulate humidity to prevent condensation from forming on bulbs.

-UMass Vegetable Program, revised 2018

Nitrogen fertility from incorporated cover crops

This spring we have seen many vigorous cover crop stands since fields were too wet to till up earlier. Now, some may be wondering, "will this rye tie up the nitrogen in my field?" Or, more specifically, "how much nitrogen is available from my cover crop mixes with legumes, and when will that nitrogen become available to my cash crop?" To answer these questions, we conducted 6 on-farm trials in MA between 2016-2017. Our first goal was to measure when nitrogen is being released by cover crops in relation to cash crop growth stages on different farms. Participating farmers were also interested in finding ways to provide nitrogen to their crops in cost effective ways and without additional phosphorus. Lastly, farmers wanted to reduce commercial fertilizer use.

We planted cover crops on six MA farms in a randomized complete block design. In early September 2016, plots were seeded using different implements on each farm with the following treatments: 1) No Cover Crop, 2) Rye (70lbs/A) and Vetch (20lbs/A), 3) Farmer Choice (Table 1). The cover crops were sampled for biomass and tissue analysis, and incorporated using different implements on each farm in late-May 2017. Two weeks later, each plot was split with half receiving 60 lbs N/A in the form of Chilean Nitrate and the other half receiving no additional N. Four weeks after incorporation, a cash crop of the farmer's choice was planted on each farm. We sampled soil nitrate 6 or 12" deep (depending on soil compaction) every two weeks beginning on the day of incorporation in late May until eight weeks after in late July. Finally, we measured yield of the cash crop planted into each of these treatments on 3 farms.

Table 1. Cover crop treatments.

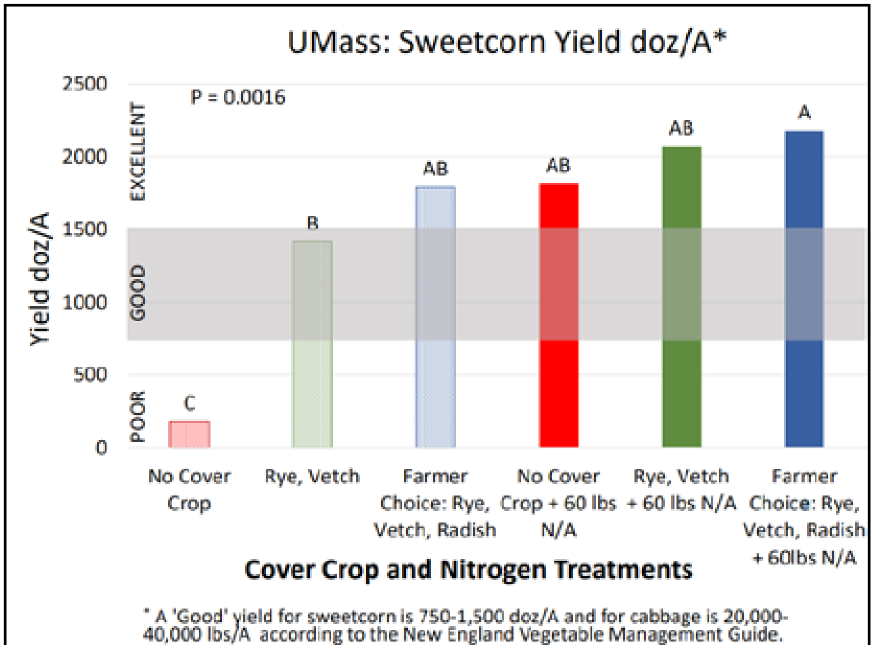
Farm	Farmer Choice (lbs/acre)	Cover Crop $/acre*	Cash Crop	Crop N needs lbs/acre	% Soil Organic Matter	2016 Fall NO_3 ppm	Soil Type
Langwater N Easton	Oat (90), Pea (50), Vetch (40)	$308	Winter Squash	110-140	6.8	105	Charlton-Paxton fine sandy loam
Lyonsville Colrain	Fria rye (15), Crimson clover (15), Vetch (18)	$136	Winter Squash	110-140	2.9	25	Occum fine sandy loam
Many Hands Amherst	*Summer 2016 seeded:* Sorghum Sudan (90) *Spring 2017 Seeded:* Oat (100), Pea (100)	$485	Cabbage	160	6.2	5	Pootatuck fine sandy loam
Tangerini Millis	Oat (90), Crimson clover (15), Vetch (18)	$205	Chard	105-130	3.4	30	Merrimac fine sandy loam
Twin Oaks Hadley	Fria annual rye (6), Crimson Clover (4), Tillage Radish (10)	$52	Cabbage	160	2.2	28	Deerfield loamy fine sand
UMass S Deerfield	Rye (60), Vetch (20), Tillage Radish (5)	$96	Sweet corn	100-130	1.7	20	Winooski silt loam

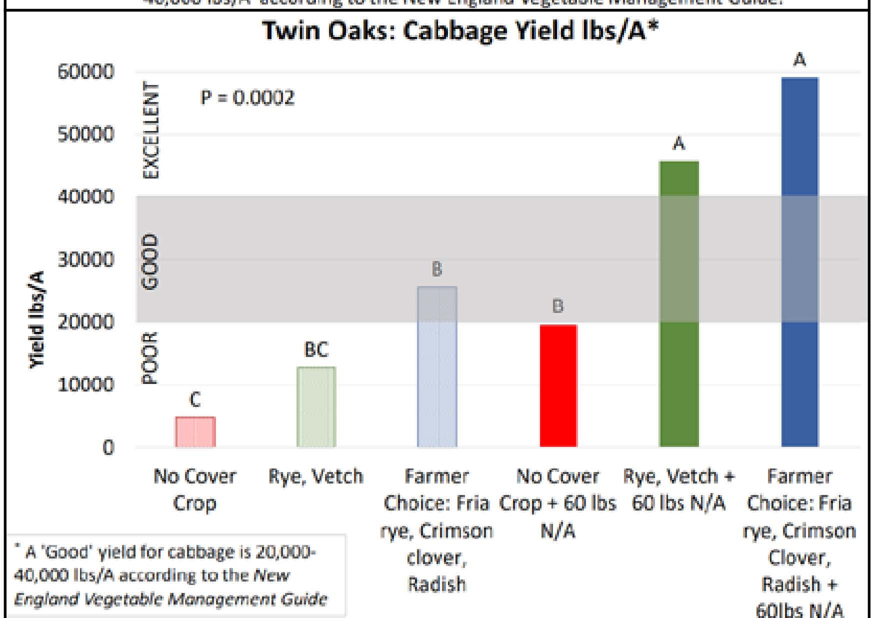
***The Rye (70lbs/A) and Vetch (20lbs/A) trt. cost $90/A and the additional 60lbs nitrogen cost $248/A.**

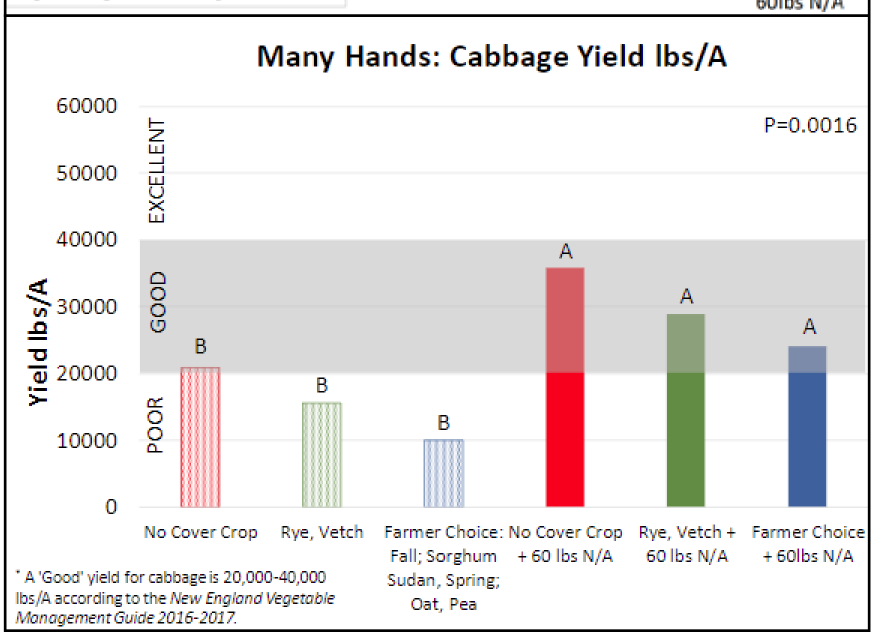
Results: Not surprisingly, there was statistically greater soil nitrate (NO3) in plots with additional fertilizer on all farms, and in most cases there was statistically greater nitrate in plots with cover crops than those without. We saw the following trend of greatest to least NO3 on 5 of 6 farms: Farmer Choice plus 60lbs N/A, Rye Vetch plus 60lbs N/A, No Cover plus 60 lbs N/A, Farmer Choice, Rye vetch, No Cover. Mostly, farmers were better at choosing treatments providing additional N compared to the traditional Rye/Vetch. In many locations, 'good' to 'excellent' cash crop yields (see New England Vegetable Management Guide) were achieved with a combination of cover crops and less than half the required N rates applied or only with the use of cover crops.

Nitrogen Release Rates: Despite these overall trends in the data, varying soil type, microclimate, and cultural practices led to the great variability in nitrate release from treatments on each farm. Twenty-five to 30 ppm NO3 is considered 'sufficient' soil nitrate for most crops at the time a pre-sidedress soil nitrate test is taken, which should be just before the plants' rapid growth phase (New England Vegetable Management Guide 2016-2017, Nitrogen Management Section.) The UMass Research Farm and Twin Oaks Farm both achieved sufficiency ranges for their cash crops (Fig 1. UMass and Fig 2. Twin Oaks). Some farms did not achieve the sufficiency range due to a combination of factors. On Many Hands Farm, we saw poor cover crop establishment, and despite high soil organic matter, saw low mineralization rates due to wet soils (Fig 3. Many Hands). Lyonsville Farm was also below sufficiency range possibly due to poor cover crop establishment, low soil organic matter, and high mineralization rates in sandy soil, which may have led to leaching (Fig 4. Lyonsville). Some farms exceeded the sufficiency range of NO3 required for their cash crops. Langwater Farm had high starting nitrate levels due to prior compost applications (Fig 5. Langwater) and Tangerini Farm applied an early spring 5-4-3 chicken manure fertilizer at 25 lbs N/acre to the entire plot (Fig 6. Tangerini).
(Click on the links to see figures)

Yields: We were only able to collect yield data from 3 of the 6 trials. An 'excellent' sweetcorn yield was achieved without the use of additional fertilizer and additional fertilizer, did not significantly increase yields at UMass (Fig. top right). "Good" yields of cabbage were achieved at Matuszko Farm (Fig. middle right) without the use of additional fertilizer, but there were statistically greater yields with the combination of cover crop and 60lbs N/A. At Many Hands (Fig. bottom right), yield was reduced with the use of cover crops! According to the farmer at Many Hands, the low yields and slow mineralization of N on his farm was likely due to several factors: 1) his field was previously planted in Sorghum Sudangrass which has a high carbon content and can slow the mineralization rates of N; 2) to reduce tillage, his only method of incorporat-







ing cover crops was with a disc, which does not break down the cover crop very much; and 3) the field in which the trial was located was very wet, and reduced oxygen will slow mineralization rates.

Conclusions: Results from this trial are as varied as the farms themselves, which is why conducting research on working farms is so useful. Farmers can gain valuable, farm specific information, combining their own experiences with research results to improve practices. Here are some conclusions and recommendations from this trial:

Cover cropping takes practice and finesse, but will pay off in the end. At $4.00 per lb/N for organic fertilizer ($434-660 per acre for most crops) or $0.85 per lb/N for conventional fertilizer ($89.25-136 per acre for most crops), a farmer is saving money by planting a nitrogen fixing cover crop. The cost of 60lbs N/A in this trial was $248 while most cover crop treatments cost less than that per acre (Table 1).

If leguminous cover crops are well managed, it is possible to meet all the nitrogen needs of a cash crop without adding phosphorus. This is what we saw in 2 out of 6 locations in this trial. So, add a legume to your fall rye or oats this year!

It is possible to exceed sufficiency ranges for cash crop N requirements with the use of cover crops and/or compost, no commercial fertilizer necessary.

Peak NO3 was released 4-6 weeks after cover crop incorporation or 2-4 weeks after additional N application on all farms. Growers can take an inexpensive soil nitrate (PSNT) test 4-6 weeks after incorporating cover crops to determine if they are in the sufficiency range for their cash crop (25-30ppm NO3), then make additional N applications only if necessary.

In similar trials on 5 farms conducted in Vermont by Becky Maden in 2016, the release rates from overwintered oats and peas on 5 farms peaked at about 60 days (8weeks) after incorporation in the spring. This may be due to colder soils in VT and earlier spring incorporation of oats and peas.

As a result of participating in this trial, farmers have implemented the following practices:

Direct seed 2 weeks after or transplant 4 weeks after incorporating their cover crops in the spring to match the peak release of N with peak demand of N by most crops.

Experiment with less nitrogen fertilizer and plant more legumes in their cover crop mixes. Some have started growing crimson clover in Massachusetts! It's beautiful, and with changing climate, seems to be surviving winters here.

Take a soil nitrate test 4-6 weeks after incorporating cover crops in the spring to measure peak N release.

Take more Soil Nitrate Tests, they only cost $15. Use this form for presidedress soil nitrate test (PSNT) samples.

Here is a surprise adoption from the trial: Plant tillage radish at 10bs/A for weed control! (photo)

April, 12, 2017.
Bottom plot: *Rye (70lbs/A) and vetch (20lbs/A)*
Middle plot: *tillage radish (10lbs/A), fria rye (6 lbs/A), crimson clover (4lbs/A). Tillage radish killed all weeds including the cover crops!*
Top plot: *no cover crop, just weeds.*
Surrounding Field: *Fria rye and crimson clover.*

This research was funded by:

Northeast SARE Project # ONE16-281c "Nitrogen contribution from cover crops for vegetable crop uptake": https://projects.sare.org/project-reports/one16-281c/ *and the New England Vegetable and Berry Grower's Association.*

Thanks to the following farms for participating: Langwater Farm, Lyonsville Farm, Many Hands Farm Corp, Tangerini's Spring Street Farm, and Twin Oaks Farm. Thanks to Seedway for providing the cover crop seed for this trial.

--Written by Katie Campbell-Nelson

News

Open Application Period for MDAR Grant Programs

The Massachusetts Department of Agricultural Resources (MDAR) is now accepting applications from agricultural operations who wish to participate in the Department's grant programs. Grants are available to help agricultural operations make farm improvements that enhance their economic viability, help prevent negative impacts to environmental resource, adapt to and mitigate climate change, improve energy efficiency, adopt renewable energy, and improve on-farm produce safety. Interested farm operators are encouraged to review the information and applications on each program's webpage. If interested in applying, applications must be submitted with any supporting documentation by the program's deadline.

Below is a list of programs, with more information (including applications) available at each program's website.

Applications for the following programs are due Friday, May 31, 2019:

- Agricultural Climate Resiliency & Efficiencies (ACRE) Program
- Agricultural Energy Program (ENER)
- Agricultural Food Safety Improvement Program (AFSIP)
- Agricultural Environmental Enhancement Program (AEEP)

Applications will be opening soon for the following programs:

- APR Improvement Program (AIP)
- Farm Viability Enhancement Program (FVEP)
- Matching Enterprise Grants Program (MEGA)

Events

Creating Pollinator Forage in the Landscape

Tom Sullivan of Pollinators Welcome will present strategies for improving bee forage. He will cover bee-friendly flowers, bloom phenology, and how to choose plants that meet site conditions and increase pollinator diversity and abundance. Along the way, he will identify threats to pollinator health and explain how we can help bees by creating pollinator havens on farms, in gardens, and within conservation areas. He will also cover native bee biology and nesting needs, and explore the basics of meadow making for beekeepers and other pollinator-positive stewards. We will go outside if weather permits, and ample resources will be provided via email after the workshop. Coffee and light refreshments will be provided.

When: Sunday, June 2, 8:30am-12:30pm

Where: Agricultural Learning Center, UMass Amherst

Registration: $25. Pay with cash or check at the door. Click here to register for this event.

This workshop is partially supported by a grant from the USDA.

Vermont Vegetable & Berry Growers Association On-Farm 2019 Workshop Series

The Vermont Vegetable & Berry Growers Association is holding a series of nine on-farm workshops from June through November this year. For more information on all workshops in this series, please click the linked event title above.

The first on-farm workshop will be held at Sam Mazza's Farm Market & Greenhouses.

When: Monday, June 10, 4:00-7:00pm

Where: Sam Mazza's Farm Market and Greenhouses, 277 Lavigne Rd., Colchester, VT 05446

This farm has one of the largest vegetable and ornamental greenhouse operations in the state. Join farm managers Gary and Laurie Bombard and greenhouse manager Neil Comstock for a tour of multiple greenhouses growing tomatoes, bedding plants and other ornamentals. Margaret Skinner and Cheryl Frank Sullivan of the UVM Entomology Lab will be on hand to describe monitoring, use of biocontrols and other IPM strategies for greenhouse pest control. Ann Hazelrigg will cover greenhouse diseases, Vern Grubinger will lead discussion of tunnel tomato production.

Attendance at these events is free for members of the Vermont Vegetable & Berry Growers Association. The cost is $10 per-person for non-members, payable on-site. Refreshments will be served. Membership in the VVBGA costs $55 per farm, per calendar year. The VVBGA works with University of Vermont Extension to deliver education and applied research for its growers.

Questions? Contact Vern Grubinger, 802-257-7967 x303. To request a disability-related accommodation, contact Dana Rupert, 802-257-7967, three weeks prior to an event so we may assist you.

Fruit and Vegetable Program Twilight Meeting at Indian Head Farm

When: Tuesday, June 25, 2019 – 4:30pm to 7:00pm

Where: Indian Head Farm, 232 Pleasant St., Berlin, MA 01503

Description and Agenda: Indian Head Farm has worked with UMass Extension Fruit and Vegetable Programs for many years. Come hear from Extension Educators about research and management updates for Brown Marmorated Stink Bug, Spotted Wing Drosophila, and High Tunnel Production issues which we have worked on with this farm over the last few years.

Indian Head Farm has also recently updated their irrigation system, converting overhead to drip, through grant support from the Massachusetts Department for Agricultural Resources (MDAR), conservation support from the Natural Resources Conservation Service (NRCS), and had the work done by Harris Irrigation. Indian Head Farm is also in the process of a farm transfer to the seventh generation! They got support with this transfer from Land For Good. Come learn how they do it all, socialize, and stay for a light supper. This program is free, but please register by June 21st so that we can plan accordingly.

- 4:30 Introductions
- 4:45 Brown Marmorated Stink Bug and Spotted Wing Drosophila research and management updates – Liz Garofalo, UMass Extension Fruit Program
- 5:15 Automating drip irrigation – James Wheeler, Jim Peeler of Harris Irrigation, Gerry Pulano (MDAR Grants for farmers)
- 5:45 Management Lessons from 20 New England High Tunnels – Katie Campbell-Nelson, UMass Vegetable Program and Jon Sardell, Indian Head Farm Field Manager
- Move to the dinner area and be seated
- 6:15 Farm Succession Planning – Farmers Tim, Janet and Kathy Ruff from Land for Good
- 7:00 Meeting adjourned.

**1 pesticide recertification credit is available for this workshop.*

For more information about this event, please visit the event page, linked to in the workshop title.

Registration: Click here to register for this workshop online. Or, contact us at (413) 577-3976 to register by phone.

Thank you to our sponsors:

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