



UMass
Extension

Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



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CROP CONDITIONS

Big bulk harvests of carrots, potatoes, beets, sweet potatoes and leeks continue. Broccoli and cauliflower are coming in as well as cabbage, celeriac, rutabagas, turnips and other fall staples. It's still cool and wet with lots of dew and diseases making a bit of a mess of things, but still harvests are big and prices are good. We get a lot of questions this time of year about how to sanitize stakes and other equipment that is tempting to re-use but may serve as a safe overwintering site for some of these pathogens. We can tell you how to do it, but it is time-consuming, messy, and hard to do well. As you've all heard from Lisa a thousand times, you can't sanitize something with dirt on it! And since it is very hard to remove the dirt from wooden stakes and weed-mat and the like, it will be very hard to actually sanitize these materials and after all that effort you may still have pathogens surviving there to infect next year's crops. If ever there was a year to toss your old stakes, I'd argue this is the year, since disease was so prevalent. Obviously, it comes down to cost, and any attempts at cleaning and sanitizing are better than nothing, so here's a protocol from Meg McGrath of Cornell University for stakes or any other equipment in need of sanitizing this winter:

Use a hose and nozzle with pressure to remove soil before storing stakes over winter. This is important because soil interferes with disinfecting. Power washing wooden stakes is not sufficient to remove bacteria because they can be in the small spaces of wood. Disinfect them now and/or in spring with a quaternary ammonia product (best) or 10% bleach solution for at least 10 minutes. Where bacterial canker developed it is recommended that the stakes be disposed of because it is difficult to eliminate all bacteria by disinfecting contaminated stakes.



We reskinned our research high tunnel last week in preparation for seeding a spinach variety trial looking at Cladosporium resistance. Stay tuned for results in the spring! Photo: L. McKeag

Fall and winter are "meeting season" and we're looking forward to several already planned and some yet to be announced. Be sure to check the events section for an updated list of in-person and online workshops, presentations, and otherwise entertaining and informative educational offerings each month. This month, Lisa will be at Farmer Dave's in Dracut with Eastern Mass CRAFT to talk about agricultural water practices and testing. Next week starts UNH Extension's lunch webinar series with an hour on winter cutworms. They are also planning an in-person, hands-on High Tunnel Conference December 6-7, don't miss it! And MDAR has its series of business planning courses, beginning with the Exploring the Small Farm Dream series starting next month in Dighton, Ma.

And in news, the United Way MA Farm Resiliency Fund has opened a second round of funding for growers impacted by this year's flooding and heavy rains who still have unaddressed needs or who missed out in the first round. Also, the

CONTACT US:

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

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

USDA has a new grant program available to agricultural employers who are eligible for H-2A participation that can cover costs associated with hiring both US and H-2A workers. And UMass is hiring again! There are 2 faculty positions open, for Assistant Professors in Urban Agriculture and Sustainable Fruit & Vegetable Production, as well as an Educator position with a focus on Integrated Pest Management. See the News & Events sections at the end of this issue for a full list of items and more details.

PEST ALERTS

Alternaria leaf blight is widespread in carrot fields. The disease causes brown spots to develop on the leaves which then can take on a singed look before the whole leaf yellows and dies back. Alternaria leaf blight leads to yield losses directly by reducing foliage and indirectly by causing carrots to be left in the ground during mechanical harvesting. For more information see the article this issue.

Winter cutworms are already causing damage in tunnels of winter greens. Small larvae feed on leaves and larger larvae feed on roots and petioles, cutting seedlings off near the soil line. Control is warranted if overall plant stand or survival is threatened. Seduce is an OMRI-approved spinosad bait that can be sprinkled over the crop and left on the soil surface. If using labeled synthetic pyrethrins which are contact insecticides, make applications between midnight and dusk when caterpillars are actively feeding and not protected beneath leaves and in the soil. Bt products (e.g. Javelin, Dipel, XenTari) and diamides (e.g. Coragen, Exirel, Harvanta) applied to the foliage should also be effective and are labeled for spinach.

Onion downy mildew was confirmed on scallions this week in Franklin Co., MA. Pale spots occur on leaves, then become brown or purplish and a gray-purple fuzzy mold develops on the surface. When conditions are favorable (<72°F and wet or humid) disease can spread quickly and leaves may yellow and die prematurely. Unlike many downy mildew species, onion downy mildew can overwinter in crop residues in the field so a 3-year rotation is recommended and wild *Allium* species and volunteers in cull piles should be eliminated. It can also affect garlic and can overwinter on cloves, bulbs, or sets, so do not save propagation material



*Winter cutworms and feeding damage in spinach.
Photos: G. Higgins*



Downy mildew in scallions, causing leaf yellowing and dieback. Lesions develop fuzzy purple-gray sporulation (right). Photos: S. B. Scheufele

from infected crops. Fungicides can be effective in controlling the disease; for a list of labeled products see the [onion, scallion, and shallot disease control section of the New England Vegetable Management Guide](#).

Damping off is being reported in direct-seeded spinach in high tunnels, reducing plant stand. Damping off is caused by a number of soil-dwelling microbes that are ubiquitous in soil, including *Pythium* spp., *Phytophthora* spp., and *Rhizoctonia solani*. As the name would suggest, damping off is a disease that often occurs where soil moisture is too high, causing seeds or seedling to rot. That said, *Rhizoctonia solani* can also cause damping off symptoms under dry soil conditions. Planting seeds too densely can also result in increased damping off and patchy or poor stands. When tunnels are used continuously, without rest, these organisms increase while numbers of beneficial microbes decrease. Making time for cover cropping or incorporating green residues before planting is the best way to support beneficial microbes in soil. Other methods for controlling damping off could include using fungicide-treated seeds or fungicides applied to soil. Some other methods being trialed around the region include soil [steaming](#), [solarization](#), and [anaerobic soil disinfection](#). All of these are labor-intensive and costly, but can be effective at suppressing disease, weeds, and insects. For more information, see the article in the [April 9, 2020 issue of Veg Notes](#).

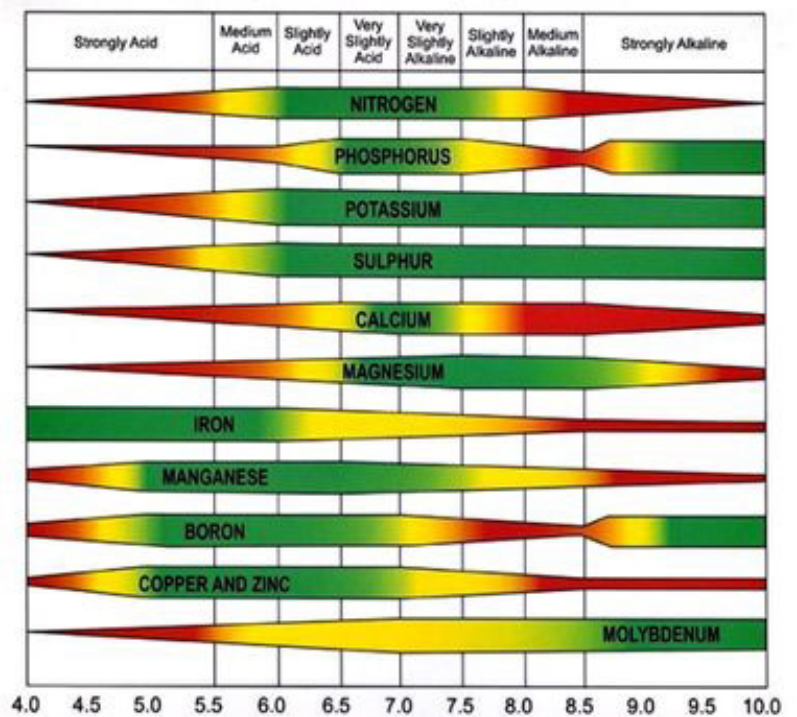


*Damping off in high tunnel spinach.
Photo: S. B. Scheufele*

SOIL ACIDITY & LIMING: FALL IS THE BEST TIME TO LIME

As crops come out of fields and the fall progresses on, many growers will be thinking about applying lime to their fields to raise soil pH or keep pH in an optimum range. Lime can be applied in the spring or fall, but fall is often preferred by growers because it allows time for the lime to react in the soil, plus fields are often too wet to access in early spring. Most growers test their soil for pH and nutrient levels every few years and apply lime as needed based on those results. For information on taking soil tests, see our [Fall Soil Testing](#) article. Soil pH is included in the standard soil test offered by the UMass Soil Testing Lab —see their [website](#) for submission forms and instructions..

Soil pH. One of the most important aspects of nutrient management is maintaining proper soil pH, which is a measure of soil acidity. A pH of 7.0 is neutral, less than 7.0 is acidic, and greater than 7.0 is alkaline. Most New England soils are naturally acidic and need to be limed periodically to keep the pH in the range of 6.5 to 6.8 desired by most vegetable crops. Scab-susceptible potato varieties are an exception but, even then, some lime may be needed to maintain the recommended pH of 5.0 to 5.2. When the soil is acidic, the availability of nitrogen, phosphorus, and potassium is reduced, with only 77% of nitrogen and potassium available and 48% of phosphorous available at a pH of 5.5. There are also usually low amounts of calcium and magnesium in acidic soils. Under acidic conditions, most micronutrients are more soluble and are therefore more available to plants, but under very acidic conditions aluminum, iron, and manganese may be so soluble that they reach toxic levels. Soil acidity also influences soil microbes. For example, when soil pH is below 6.0, bacterial activity is reduced and fungal activity increases. Acidic soil conditions also reduce the effectiveness of some pesticides.



Effect of soil pH on nutrient availability.

Active and reserve soil acidity. To manage soil acidity, growers can apply a basic (compared to acidic) material. The most common and effective material is agricultural limestone, which will be discussed in the next paragraph. To explain how this works, a little background chemistry: soil pH is a measure of the free hydrogen ions (H^+) in the soil solution, also known as “active acidity”. Additionally, there are positively-charged hydrogen and aluminum ions (H^+ and Al^{3+}) bound to negatively charged sites on clay particles and organic matter in soil; these tied-up ions represent “reserve acidity” in the soil. The amount of these binding sites on clay particles and organic matter is referred to as the cation exchange capacity (CEC) of a soil. Soils with more clay or with higher organic matter have a higher CEC than sandier soils or those with lower organic matter. When lime is added to a soil, active acidity is neutralized by chemical reactions that remove free hydrogen ions from the soil solution. Tied-up ions making up the soil’s reserve acidity are then pulled into the soil solution to replace the free hydrogen ions, causing the soil to resist that change in pH. The ability of a soil to resist the change in pH is referred to as a soil’s “buffering capacity”. Clay soils or soils with high organic matter have lots of binding sites for H^+ and Al^{3+} and therefore lots of potential for those ions to be pulled into solution, so these soils are well-buffered compared to sandy soils or soils with low organic matter. To effectively raise the soil pH, both active and reserve acidity must be neutralized. Soil testing labs determine buffering capacity and lime requirement by measuring or estimating the reserve acidity, using a variety of techniques.

Liming materials and calcium carbonate equivalence. There are several materials that can be used to raise soil pH. One of the oldest is [wood ash](#), which is still used by some farmers and gardeners. Today, the most frequently used material is pulverized limestone, also called agricultural lime. Limestone is a common type of sedimentary rock composed of calcium carbonate. It is formed in two ways: oysters, clams, coral, and other ocean-dwelling organisms use calcium carbonate found in seawater to form their shells or other hard surfaces, which accumulate and compress into limestone after they die; and sedimentary ocean water can evaporate to form calcium carbonate deposits. There are two types of agricultural lime available: *calcitic* lime is calcium carbonate alone and *dolomitic* lime is calcium carbonate plus magnesium carbonate, which should be used if you also need to add magnesium to your soil.

Different materials and even lime from different sources have different neutralizing capacities. Neutralizing capacity is measured by calcium carbonate equivalence (CCE), where pure calcium carbonate has a CCE of 100; other materials can have a CCE higher or lower than 100. All liming materials other than pure calcium carbonate contain some level of inert ingredients that will not neutralize soil acidity and therefore have a CCE of less than 100. Liming recommendations made by University soil testing labs are based on a CCE of 100; if your liming material is lower than 100, you will need to apply more than the recommended amount, and if it is higher, you will need less. To determine the amount of liming material to apply, divide the recommended amount by the percent CCE of your material and multiply by 100. For calcitic and dolomitic limes, your supplier can tell you the CCE of the lime you are purchasing. The CCE of wood ash is typically around 50%, but it can vary widely. If purchasing wood ash from a commercial supplier, they should provide a recent analysis. Otherwise the wood ash should be submitted to a lab offering lime analysis to determine the CCE. Wood ash also contains phosphorous and potassium in varying amounts, which is another good reason to have your wood ash analyzed before applying.

Speed of lime reaction. The speed with which lime reacts in the soil is dependent on particle size and distribution in the soil. Finely ground materials react more quickly than coarse materials. To determine fineness, lime particles are passed through sieves of various mesh sizes. A US Standard 10-mesh sieve has 100 openings per square inch while a 100-mesh sieve has 10,000 openings per square inch. Lime particles that pass through a 100-mesh sieve are very fine and will dissolve and react rapidly (within a few weeks). Coarser material in the 20- to 30-mesh range will react over several years. Agricultural ground limestone contains both coarse and fine particles. About half of a typical ground limestone consists of particles fine enough to react within a few months, but to be certain you can obtain a physical analysis from your supplier. Super fine or pulverized lime is sometimes used for a “quick fix” because all of the particles are fine enough to react rapidly, but these fine materials can be difficult to spread and are usually more expensive than coarser materials. Pelletized lime is also an option; this is pulverized lime that is re-formed into pellets. Pelletized lime reacts more quickly than ground lime and is easier to apply than pulverized lime but is significantly more expensive. Pelletized lime products include ingredients that bind the powdered lime together; some binding products are not OMRI-approved, so be sure to check this if you are a certified organic farm. Because it takes months or years for lime to react in the soil, the timing of liming isn’t a big deal—most growers lime in the fall because it maximizes the reaction time before spring and it’s often easier to access fields in the fall, but whatever lime you apply at whatever time will have an effect in the long run.

Lime will react most rapidly if it is thoroughly incorporated to achieve intimate contact with soil particles. This is best accomplished when lime is applied to a fairly dry soil and disked in (preferably twice). When spread on a damp soil, lime tends to cake up and doesn't mix well. A moldboard plow has little mixing action; disking is therefore preferred.

Besides neutralizing acidity and raising soil pH, lime is also an important source of Ca and Mg for crop nutrition. It is important to select liming materials based on Ca and Mg soil content with the aim of achieving sufficient levels of each for crop nutrition. If the Mg level is low, a dolomitic lime (high magnesium lime) should be used; if Ca is below optimum a calcitic (low magnesium lime) should be used. If soil pH is high and Ca is needed, small amounts can be applied as calcium nitrate fertilizer (15% N, 19% Ca), calcium sulfate (aka gypsum, 22% Ca) or superphosphate (14% to 20% Ca).



Pulverized vs. pelleted lime. Photo: FEECO International

--Adapted by Genevieve Higgins from the New England Vegetable Management Guide

WORKING WITH CONTRACTORS ON A POSTHARVEST PROJECT

--Written by Chris Callahan, Extension Associate Professor of Agricultural Engineering at the University of Vermont. Originally published March 16, 2023 on the UVM Extension Ag Engineering blog, <http://go.uvm.edu/contractors>

Key Takeaways

- 1. Have a Plan** – Well planned is half-done. Sketch out your scope, schedule, and budget and consider doing the work in phases if needed.
- 2. Check References** – Make sure this partner is going to do what they say they will and find out how they are to work with.
- 3. Know Your Skills & Know Their Skills** – It may make sense to split the work up between you and the contractor, be clear about that and know what you're getting into.
- 4. Use Examples from Other Farms** – Harness the wisdom of the community. Lots of other growers have been through similar projects and are willing to share their hard lessons learned.
- 5. Research Materials, Buildings, and Equipment** – So many options, which is best? Check out the farm case studies we've linked below and look at the topic-specific resources to support a conversation on your farm about the fine details of your project that can make a big difference.

Introduction

Construction projects are both exciting and daunting. There's great joy in dreaming about a new space or a renovated work area, but there can be a long windy path full of dread and stress between what you have now and what you hope to have in the future.

Working with a contractor partner can ease this path, but it can also add stress and unexpected twists and turns.

We've compiled a list of helpful considerations below for you to explore as you think about a farm construction project. These are based on informal interviews with lots of farms we have worked with including some who have shared their learning through [postharvest case studies](#).

1. Have a Plan – Scope, Schedule, Budget

No matter what, this is your project. And you need to know what you want to accomplish (scope), when (schedule) and with what resources (budget). [Our guide to postharvest project planning](#) can help you make sure you're thinking about the important aspects of a pack shed and storage space.

It will likely be important to prioritize your needs and make a plan that includes several stages of work since budget is often limited. Having this conversation with your contractor will help them understand your overall plan and could help to establish a nice long-term relationship to support that plan.

Get estimates from contractors that are specific to the key parts of the project. This will help you better prioritize which work can be done when. A lump sum estimate is not very helpful when you're trying to plan your project. Know the terms of the contract. The most common are time and materials not to exceed a certain amount, open ended time and materials, or fixed fee. Whatever it is, get it in writing with a completion date noted. Never pay the full fee up front.

2. Check References

It sounds almost cliché, but always check references. Unless you have a super solid, long-standing relationship with the contractor, it is important to understand how they've worked with other farmers.

This is a big commitment for you and your farm. You're spending a chunk of change to make your working area better. You need to know that they understand your work and what you need, and that they will be there for you to get the job done well. Angie's List has a [great list of questions](#) that can be helpful for guiding the reference check.

Farm construction projects, especially postharvest projects, are tricky. They are not typical residential construction projects. They are more like commercial construction projects with the added twist of lots of water which demands proper materials and sealing, lots of movement of raw produce, intermittent use, lots of weird and variable temperature differences that can result in condensation in odd places, a mix of water and electricity that both need to be very accessible, and did I mention water (e.g. [hoses](#) and [drains](#))?

For this space to work for you, someone is going to have to pay attention to a lot of details. When checking references ask if this contractor is detail oriented. It will pay off.



The barn renovation at [New Leaf Organics](#) required removing old concrete work which was contracted out. Photo: UVM Ag Engineering

3. Know Your Skills & Know Their Skills

Growing food and feeding the world is a big lift. And that's your primary job, right? But you probably have some construction skills, and you may want to have a part in the actual work.

Be clear about where you can pitch in and where you need the expertise (and probably more so, the availability) of a contractor. This is a great conversation to have together and to be very clear about. It often follows the first estimate following an initial discussion of the overall project scope.

Sticker shock is common and there's an opportunity to think about what can be done later and what can be done by the farm. It could be helpful to think about what BEST can be done by the contractor with the best quality and to meet the schedule of the project.

You'll likely have plenty of other things to do on the farm no matter what time of year it is, so be realistic with your own schedule and commitments. Do you love moving earth? Maybe you can do some of the site prep. Good with framing? Hit it. Prefer the finer details? Jump in at the end. Like electronics? You can wire this job (if local code enforcement allows). Always playing with water? Do the plumbing (if local code enforcement allows). More of the "move-in when done" type? Don't worry there's still plenty to do after the building work is "done."



Where is your time best spent? Foundations? Framing? Farming? You have to find (or make the decision) on where to balance your skills and time you have to allocate to the project. Photos: UVM Ag Engineering















4. Use Examples from Other Farms


In our experience, farms who have been through projects are very willing to share their knowledge with other farms.

When we work with growers on postharvest projects, we often try to capture these project experiences in the form of case studies. In [these case studies](#) you can see how the highlighted farm made their decisions, where things may have not gone to plan, what they are most happy with, and what they would do differently.

There are probably some growers near you who have been through projects fairly recently and may have some lessons learned to share. They may also have names of contractors to talk with or to avoid. We're all part of a learning community, reach out to each other and talk.

Post Harvest Case Studies 13 farms 3 formats: Blog Post PDF Video (starting to use 360° photo tour)

 Small Axe	 A Lightly Road	 High Meadows	 Jericho Settlers	 Stout Oak
 Ananda Gardens	 New Leaf Organics	 Flywheel	 Hall Brook	
 Root 5	 Last Resort	 Footprint	 Indian Line	

go.uvm.edu/phcs 

Check out these [postharvest case studies](#) that describe how other farms have approached their projects. Image: UVM Ag Engineering

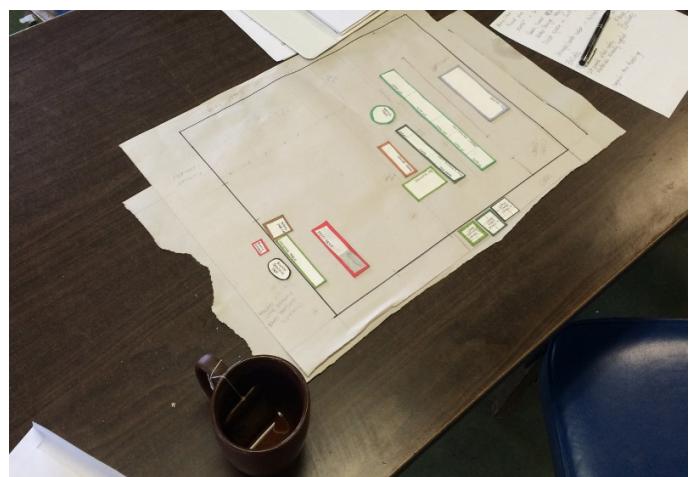
5. Research Materials, Buildings, and Equipment

Every single postharvest project is unique, just like you. We've compiled a planning guide which provides a framework for considering the common major parts of a project. But it is important to think about the specific things that will make this project really sing for you.

One common lens is to think about what is causing you pain right now in your wash pack and storage spaces. What specific things would really unlock some ease of flow or reduce steps or support joy? Maybe a big project isn't needed? Maybe there are some simple tweaks that you never thought of because you're often too busy doing the work.

Sketch it out as floor plan and try rearranging things virtually to see if a different approach could be helpful. Gather the team together over beverages and see what changes everyone else thinks could help.

Then dig in on the web and through conversation with



Get the team together and explore layout options. Not into computer design programs? No problem. A rough outline of the space done to scale can provide a flexible planning canvas. Cardstock cutouts of equipment, tanks, and sinks (also to scale) can be moved around easily to explore options as a group. Photo: Jody Bolluyt, Roxbury Farm, Kinderhook, NY

other growers. What do other people use for [root washers](#)? [Greens bubblers](#)? [Cooler walls](#)? [Spray tables](#)? [Hoses](#)? [Drains](#)? [Floors](#)? How about a [rinse conveyor](#)? Smooth and cleanable [materials](#)? [Sanitizer](#) dispensing and use? How about easing pain with better [ergonomics](#)? Are we missing something in our list? Let us know [by email](#).

Learn From Others: We hosted a Winter Twilight Grower Round table on this topic, you can watch the recording of it [here](#).

Acknowledgements: This publication is based on the input and lessons learned of more farmers and colleagues than we can count. We learn something from just about every farm construction project we're part of. Thanks to all of you for sharing your learning with us and allowing us to share it with others.

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IDENTIFYING DISEASES OF CARROTS

Storage crops of carrots are sizing and sweetening up now, putting energy into root growth as we enter fall and converting starches into sugars as the temperatures drop. Carrots can be affected by many bacterial and fungal diseases, as well as nematode pests in the field or while in storage. Foliar diseases may cause lower yields due to loss of photosynthetic ability, difficulty harvesting if the tops are weakened, and lower marketability if the carrots cannot be sold in bunches. Root diseases can lower yields of fresh eating carrots and can spread in storage, drastically reducing sales through later markets. Root diseases are caused by soil-dwelling organisms and therefore their incidence may vary considerably from farm to farm or even from one side of a field to the other. Proper disease identification will help you to prevent future outbreaks by adjusting crop rotations accordingly, and will prevent moving infested soil from field to field. Some of the major carrot disease symptoms are described below. If you are noticing foliar or root symptoms like those described, send a sample to your state diagnostic lab to confirm, and take steps to protect current and future crops. See the [UMass Diagnostic Lab website](#) for their sample submission instructions.

Foliar Diseases

Alternaria leaf blight (*Alternaria dauci* and *A. radicina*) symptoms first appear along leaflet margins as greenish-brown, water-soaked lesions, which enlarge, turn brown to black, and often develop a yellow halo. Older leaves are more susceptible to infection. Leaves often appear singed or burned from afar. When about 40% of the leaf is infected, the leaf yellows, collapses, and dies. Lesions on petioles are also common and can quickly kill entire leaves. *A. radicina* can also produce a dry, mealy, black decay on known as black rot on carrot roots held in storage.



Alternaria leaf blight (left) and bacterial leaf blight (right). Photos: R. L. Wick

Bacterial leaf blight (*Xanthomonas campestris* pv. *carotae*) symptoms initially look similar to those of *Alternaria* leaf blight; symptoms appear primarily on leaf margins as small, yellow, angular leaf spots, which expand, turn brown to black with a yellow halo, and become dry and brittle. Leaflets may become distorted and curled. Symptoms can extend into petioles where they produce a yellow-brown, gummy exudate, and may also occur on flower stalks. Infected umbels can be completely blighted and seed infection can occur—use treated seed to prevent introducing this disease.

Root Diseases

Root knot nematode (*Meloidogyne hapla*) forms galls or root thickenings of various sizes and shapes. Where soil populations of *M. hapla* are high, symptoms include stunted plants, uneven stands, premature leaf death, and forking and swelling of both lateral and tap roots, which can significantly reduce marketable yield. *M. hapla* persists in the soil and has a very wide host range so rotation can be difficult, but grasses are non-hosts so small grains, corn, and grassy cover crops like Sudangrass can be grown in rotations to reduce the size of the population.



Root knot nematode. Photo: R. L. Wick

Black root rot (*Thielaviopsis basicola*) occurs primarily in storage when conditions are not ideal and temperature and humidity are too high. The fungus causes superficial, irregular, black lesions on roots. The discoloration, caused by masses of dark brown to black chlamyospores, is limited to the skin. The pathogen rapidly invades wounded tissue and is favored by long post-harvest periods without cooling, so careful harvest and immediate cooling (<41°F) can minimize the impact of this disease.



Black root rot. Photo: R. L. Wick

White mold (*Sclerotinia sclerotiorum*) affects many vegetable crops but carrots are particularly susceptible, especially late in the season and during storage. The fungus may be present in soil, storage areas, or containers. Symptoms include characteristic white mycelial growth and hard, black sclerotia (masses of fungal tissue surrounded by a hard, black rind that serve as long-term survival structures), which may be seen on the crown of infected carrots. In storage, carrots develop a soft, watery rot, and fluffy, white mycelia and sclerotia can also develop. Sclerotia can persist in the soil for many years and the fungus has a very wide host range, making this disease difficult to manage. Grasses and onions are non-hosts that can be used in rotations, and a commercially available biocontrol product, Contans, has been shown to be effective in parasitizing overwintering sclerotia. Contans should be incorporated into infested soils in the fall to give the biocontrol fungus time to infect the sclerotia.



White mold. Photo: W. Brown Jr, Bugwood.org

Cavity spot and root dieback (*Pythium* spp.): Infections from several *Pythium* species can occur during early root development and are favored by moist soil conditions. Root dieback symptoms appear as rusty-brown lateral root formation, or forking and stunting; symptoms that can be easily confused with damage from nematodes, soil compaction, or soil drainage problems. Cavity spot often shows up later in the season, closer to harvest. Horizontal, sunken lesions varying in size from 1-10 mm appear on the surface of the root and can provide an ingress for secondary fungal or bacterial infections.

Crown rot (*Rhizoctonia carotae*): Early symptoms are horizontal dark brown lesions around the root crown. As the crop matures, the tops may die in patches in the field and as the disease progresses, lesions coalesce to form large,

deep, rotten areas on the crown of the root. *R. carotae* can also cause crater rot and violet root rot, but these diseases are less common in MA. Crown rot is favored by moist conditions, so if you have a known infested field, planting on raised beds and/or avoiding low or compacted areas in the field can minimize disease incidence.

Scab (*Streptomyces* spp.) can cause both raised and sunken, dry, corky lesions on the carrot root. This disease is less common than others described in this article and when it does occur symptoms are rarely severe enough to cause major losses in yield or marketability. Avoid planting carrots in alkaline soils, which are known to favor the incidence of scab, or in fields that were previously planted in potatoes that had high incidence of scab, as the species that infects potatoes can also infect carrots.



Cavity spot. Photo: S. Livingston



Scab. Photo: R. L. Wick

Bacterial soft rot (*Pectobacterium carotovorum* subsp. *carotovorum*) is a common disease in storage where it infects roots that were previously wounded or diseased. It occurs in the field only rarely, under extremely wet soil conditions. Symptoms start as small, water-soaked lesions that quickly spread and cause affected areas to become mushy, though the skin may remain intact over the liquefied flesh underneath. To avoid problems in storage, avoid wounding carrots during harvest and washing and maintain proper storage conditions.

To avoid losses in storage, try to achieve optimum storage conditions of 32-34°F (essential to minimize decay and sprouting during storage) and high relative humidity (required to prevent desiccation and loss of crispness). Mature topped carrots can be stored for 7-9 months at 32°F with 98-100% RH. Those ideal conditions are difficult to achieve, but topped carrots are often successfully stored for 5-6 months at 32-41°F with 90-95% RH. Prompt cooling of harvested carrots to below 41°F also helps maintain crispness. Carrots produce very little ethylene (a byproduct of respiration) themselves but are sensitive to ethylene produced by other crops in storage and exposure causes production of the bitter compound isocoumarin, which is concentrated in the peel—peeling carrots will remove the isocoumarin. Unless outside temperatures are very low or very high, ventilation is an inexpensive method of reducing ethylene levels. Ethylene can also be absorbed on commercially available potassium permanganate pellets.

--Written by Susan B. Scheufele, UMass Extension

NEWS

UMASS EXTENSION IS HIRING! 2 EXTENSION FACULTY & 1 EXTENSION EDUCATOR POSITIONS

• Extension Assistant Professor – Urban Agriculture

The Stockbridge School of Agriculture at the University of Massachusetts Amherst invites applications for a full-time, non-tenure track, 12-month, Extension faculty position at the rank of Assistant Professor. We are looking for a candidate who will develop an integrated program in urban agriculture involving Extension, teaching, and research.

Urban agriculture encompasses a wide range of skills and expertise that includes, but is not limited to, horticulture, indoor production, environmental remediation, soil health, community and urban development, nutrition, and food systems. A new faculty member would link efforts in these areas in Stockbridge, the Center for Agriculture, Food & the Environment, and the University in an urban agriculture and food systems program. The new faculty member will have the opportunity to modify and develop courses in urban horticulture and food systems in Stockbridge for both campus and online programs, and guide students in related internships.

Click [HERE](#) for more information and to apply.

Review of applicants will begin December 1, 2023, and will continue until an ideal candidate is identified. Questions can be directed to the search committee chair, Dr. Daniel Cooley (dcooley@umass.edu).

• **Extension Assistant Professor - Sustainable Fruit & Vegetable Production**

The Stockbridge School of Agriculture at the University of Massachusetts Amherst invites applications for a full-time, 12-month, Extension faculty position at the rank of Assistant Professor. The successful candidate will participate as a full member of UMass faculty in a 12-month, non-tenure track appointment.

We are looking for a candidate who will develop applied research and Extension programs that will support commercial fruit and vegetable production while investigating and implementing innovative and sustainable production systems that support farm sustainability and viability. Instructional responsibilities may include courses in sustainable horticulture, fruit or vegetable production, or related courses in the candidate's disciplinary area.

Click [HERE](#) for more information and to apply.

Review of applicants will begin November 15, 2023, and will continue until an ideal candidate is identified. Questions can be directed to the search committee chair, Dr. Jaime Piñero (jpinero@umass.edu).

• **IPM Extension Educator III**

UMass Extension is hiring an IPM Extension Educator III to provide educational programming, technical assistance, and applied research on integrated pest management (IPM) topics including weed, insect, and/or disease management.

Audiences may include commercial agricultural producers at all scales and statewide, potentially including fruit, vegetable, diversified cropping systems, and indoor environments. Successful candidates will have at least an MS and two years of relevant professional experience, with a strong IPM background preferred.

Special consideration will be given to candidates with expertise that fills gaps in existing UMass Extension programming, including small fruit IPM and production in a variety of controlled environments, but other expertise areas relevant to IPM will be considered. This is a 24-month appointment that may be extended pending funding availability.

Click [HERE](#) for more information and to apply.

CLIMATE ADAPTATION AND MITIGATION FELLOWSHIP NOW ACCEPTING APPLICATIONS

Climate change is reshaping the landscape of agriculture and forestry, bringing challenges like extreme rainfall and flooding, increased pest pressure, and drought to farms and forests in the Northeast and Midwest United States. [Climate Adaptation and Mitigation Fellowship \(CAMF\) Programs](#) aim to be a part of the solution. CAMF is designed to empower farmers and agricultural advisors to gain and share knowledge and tools needed to be resilient in the face of climate uncertainty.

Climate Adaptation and Mitigation Fellowship programs will begin in Winter 2024.

These cohort-based learning opportunities are for farmers and agricultural advisors in the Northeast and Midwest who are interested in climate change adaptation and mitigation strategies and planning, as well as peer-to-peer networking and support. Programs will run in the following topic areas:

- Diversified agriculture and agroforestry producers and advisors in the Northeast
- Women and non-binary vegetable and small fruit producers and advisors in the Northeast and Midwest
- Row crop producers and advisors in the Midwest

An informational webinar was held on October 11, with an overview of the program and instructions about submitting an application. A recording will be posted [here](#).

Applications are due by 11:59 PM on November 11, 2023. [Click here to apply.](#)

SECOND ROUND OF UNITED WAY MA FARM RESILIENCY FUND NOW ACCEPTING APPLICATIONS

The MA Farm Resiliency Fund is accepting applications for the Second Round of funding focused on supporting Central and Western Massachusetts farms that sustained major losses during the flooding and heavy rains of July 2023. Only farms with unaddressed needs greater than \$80,000 or who did not apply in the first round are eligible to apply.

“Unaddressed need” is defined as a farm’s sustained loss, minus funding received to address those losses. All remaining funds raised will be disbursed proportionate to remaining need.

Applications are due October 20, 2023.

This round is for farms that have an unaddressed need of more than \$80k or more because of the flooding and heavy rain in July 2023.

Farms that applied in the first round must apply again to be considered. Farms that did not apply in the first round are welcome to apply.

The review process will be complete by mid-November and checks will be released before the end of November.

You can access the application here: [MA Farm Resiliency Fund Application to Request Second Round Funding](#)

ORGANIC CERTIFICATION COST SHARE PROGRAM: DEADLINE IS NOVEMBER 1, 2023

The U.S. Department of Agriculture (USDA) will cover up to 75% of the costs associated with organic certification, up to \$750 per category, through the [Organic Certification Cost Share Program](#) (OCCSP). USDA’s Farm Service Agency (FSA) encourages agricultural producers and handlers to apply for OCCSP by Nov. 1, 2023, for expenses incurred from Oct. 1, 2022, through Sept. 30, 2023.

Cost Share for 2023: The cost share provides financial assistance for organic certification, and producers and handlers are eligible to receive 75% of the costs, up to \$750, for crops, wild crops, livestock, processing/handling and state organic program fees (California only).

Producers have until Nov. 1, 2023, to file applications, and FSA will make payments as applications are received.

How to Apply: To apply, organic producers and handlers should contact their local [USDA Service Center](#). As part of completing the OCCSP application, producers and handlers will need to provide documentation of their organic certification and eligible expenses.

Organic producers and handlers may also apply for OCCSP through department of agriculture. Additional details can be found on the [OCCSP webpage](#).

NORTHEAST SARE FARMER GRANT PROGRAM NOW OPEN

The Call for 2024 Northeast SARE Farmer Grants is [now available](#). Approximately \$800,000 has been allocated to fund projects for this grant cycle. Awards of up to \$30,000 are available, depending on the complexity of a project. The online system for submitting proposals will open on September 15, 2023.

Proposals are due no later than 5:00 p.m. EST on November 14, 2023.

Northeast SARE Farmer Grants provide the resources farmers need to explore new concepts in sustainable agriculture conducted through experiments, surveys, prototypes, on-farm demonstrations or other research and education techniques. Projects address issues that affect farming with long-term sustainability in mind.

Farmer Grants are designed to be a strong starting point for farmers interested in pursuing grant funding for projects. Before starting their proposals, potential candidates identify a Technical Advisor who can provide non-farming expertise in areas such as research design, troubleshooting, and promotion. The Technical Advisor acts as a go-to support person throughout the grant project, making it easier on first time grantees and forging new relationships in agricultural communities across the Northeast.

Northeast SARE funds projects in a wide variety of topics, including marketing and business, crop production, raising livestock, aquaculture, social sustainability, climate-smart agriculture practices, urban and Indigenous agriculture and more. [Click here to see examples of funded Farmer Grant projects.](#)

Northeast SARE covers the Northeast and Mid-Atlantic states of Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, West Virginia, Vermont, and Washington, D.C

SARE Farmer Grant Q&A Sessions

When: Wednesdays, October 18 & 25, 12-1pm

Where: Online

Registration: [Click here to register](#). You do not need to submit a question ahead of time to participate in any of the Q&A sessions, but you will need to register. Registration grants access to any of the Q&A sessions.

Northeast SARE Farmer Grant Administrator Candice Huber will be hosting a series of drop-in Q&A sessions to answer any questions potential grantees have about their 2024 Farmer Grant proposals.

You can also submit questions to be answered by email [here](#), without attending a Q&A session.

[This page](#) will be updated with answers and recordings of the sessions.

If you have a question about your grant proposal that you would like to keep confidential, contact Candice Huber at candice.huber@uvm.edu.

FARM LABOR STABILIZATION AND PROTECTION PILOT PROGRAM

The USDA is accepting applications for grants under the new [Farm Labor Stabilization and Protection Pilot Program](#) (FLSP). The program will award grants in amounts ranging from \$25,000 to \$2 million dollars to agricultural employers who implement robust labor standards to promote a safe, healthy work environment for both U.S. workers and workers hired from northern Central American countries under the seasonal H-2A visa program.

The stated goals of the FLSP Program are to:

1. Drive U.S. economic recovery and safeguard domestic food supply by addressing current labor shortages in agriculture;
2. Reduce irregular migration from Northern Central America through the expansion of regular pathways; and
3. Improve working conditions for all farmworkers.

Grants can cover costs related to the hiring and onboarding of US and H-2A workers (e.g., recruitment costs, attorney's fees) as well as operational costs (e.g., wages, administrative costs) and housing maintenance costs, including rental or housing conversion costs. For more information on the allowable and unallowable costs, see pages 9-10 of the [FLSP terms and conditions](#).

To be eligible, applicants must meet the regulatory requirements of the H-2A program and commit to fulfilling certain baseline requirements and any supplemental commitments. See pages 8-11 of the [Notice of Funding](#) for a description of the requirements. Award amounts are determined based on the number of full-time equivalent employees and the degree of commitment to certain practices.

The application deadline is November 28, 2023, but USDA encourages applicants to **submit materials at least 2 weeks prior to the deadline** to ensure all certifications are met.

FLSP and H-2A Technical Assistance: USDA will offer no-cost technical assistance (TA) to help applicants navigate a broad range of needs in applying to this grant program, including determining eligibility and desired award level, meeting grant requirements, and navigating U.S.-based recruitment and the H-2A program and compliance. In addition to the grant funding itself, the technical assistance is one of the program's primary benefits for agricultural employers. For more information on technical assistance available, visit: www.ams.usda.gov/FLSP.

EVENTS

UPCOMING UNH HIGH TUNNEL WEBINARS

• Winter Cutworm Updates

When: Monday, October 16, 2023, 12-1pm

Where: Online

Registration: No pre-registration needed. Join the webinar here: <https://unh.zoom.us/j/91841085085>

Winter cutworm is an emerging pest of high tunnel vegetables. This caterpillar feeds at night and is active during the coldest months, causing dramatic losses to vegetable crops grown through the fall and winter. Join this discussion with Dr. Navneet Kaur (Assistant Professor and Extension Entomologist at the Oregon State Univer-

sity) and Dr. Anna Wallingford (UNH) to learn more about winter cutworm and Dr. Kaur's research on beneficial nematodes for winter cutworm management.

- **Biological Control in Winter High Tunnels**

When: Monday, October 23, 2023, 12-1pm

Where: Online

Registration: No pre-registration needed. Join the webinar here: <https://unh.zoom.us/j/91841085085>

High tunnels allow us to extend the vegetable production season, but pest management can be challenging without the help of natural enemies. Join this discussion with Dr. Laura Ingwell and Dr. Samantha Willden (Purdue University) who have been leading a team of researchers to find the best approaches to biocontrol through the fall and winter.

Questions? Contact Amber Vinchesi at amber.vinchesi@unh.edu.

EASTERN MA CRAFT MEETING: [GEOTHERMAL WATER USE AND GOOD AGRICULTURAL PRACTICES AT FARMER DAVE'S](#)

When: Saturday, October 21, 4-6pm

Where: Farmer Dave's, Dracut, MA

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

EXPLORING THE SMALL FARM DREAM COURSE

- **Fall Session:**

When: Wednesdays, November 8 – December 13, 2023 (no session November 22), 6:00pm-9:00pm

Where: tentative Dighton

- **Winter Session:**

When: Wednesdays, January 17 – February 14, 2024, 6:00pm-9:00pm

Where: location tbd based on interest, tentative Western Mass

Registration: [Click here for course application](#). If interested, please complete the brief application found here: Exploring the Small Farm Dream and email it to Jessica.Camp@mass.gov, or mail a hard copy to: MDAR, Attn: Jessica Camp, 138 Memorial Ave, Suite 42, West Springfield, MA 01089. For more information, see ABTP program webpage or contact Jess at 617-823-0871.

The 5-session [Exploring the Small Farm Dream](#) course provides guidance to aspiring farmers through the decision-making process of whether to start a farm business. Participants will learn about the many aspects of starting a farm business, assess their own skills and knowledge, and get help finding resources for support, including marketing, financing, and regulations. The course utilizes the Exploring the Small Farm Dream curriculum and workbook developed by the New England Small Farm Institute. Through four guided group sessions and a farmer panel session, participants will analyze the feasibility of their small farm dream and clarify their vision together with other class participants.

VEGETABLE FARMS BECOMING THE EMPLOYER OF CHOICE

When: Mondays and Thursdays, November 9 - December 11, 9am-11am *Central* Standard Time (10am-12pm EST)

Where: Online

Registration: [Click here to register](#).

Join this series of online workshops, hosted by University of Wisconsin-Madison Extension and the FairShare CSA

Coalition.

Motivating and managing employees is essential to most diversified vegetable farms, and rare is the farmer who comes to farming with those labor management skills. Whether you have worked with employees for many years or are in the early stages of hiring staff, this series will give you practical tools to make your farm an employer of choice. We will cover thoughtful hiring practices, developing a motivated workforce, establishing a positive farm business culture, providing reviews and feedback, and much more through this eight-part series. Research-based approaches and real world examples make this series practical and useful for any vegetable farm employer or experienced manager. Farmer trainers center peer-to-peer connection and learning, and attendees also receive a carefully curated set of resources to accompany each session. From example position descriptions and check-in templates to a catalog of interview questions and so much more, these resources will help you leave each session ready to take those next concrete steps.

Please plan to attend online sessions with your camera on and ready to engage in discussions with your farmer peers.

[Click here for topics and speakers on each date.](#)

HIGH TUNNEL PRODUCTION CONFERENCE: REVITALIZING YOUR TUNNEL VISION

When: Wednesday-Thursday, December 6-7, 2023

Where: Fireside Inn & Suites, 25 Airport Rd., West Lebanon, NH, 03784

Registration: \$100 for first farm attendee. \$75 for each additional farm attendee. [Click here to register.](#)

Come learn how to fine-tune your high tunnel crop production skills and visit the trade show. This conference is for high tunnel growers and agricultural service providers of all experience levels.

[Click here for full agenda.](#)

3 pesticide recertification credits are available for day 1, and 3.5 credits are available for day 2. This event is co-sponsored by UVM, UMaine, UNH, and Northeast SARE.

GROWING YOUR FARM BUSINESS PLANNING COURSE

When: Tuesdays, January 9 - March 5, 2024, 6pm-8pm. No class February 20.

Where: MDAR office in West Springfield, MA or an alternate western MA location dependent upon interest.

Registration: [Click here for course application.](#) Applications are accepted on a rolling basis. If interested, please complete the brief Growing Your Farm application and email it to Diego.Irizarry-Gerould@mass.gov, or mail a hard copy to: MDAR, Attn: Diego Irizarry-Gerould, 138 Memorial Ave, Suite 42, West Springfield, MA 01089. For more information, see [ABTP program webpage](#) or contact Diego at 857-248-1671. The course fee, subsidized by MDAR, is \$150 per farm. It is important to us that course fees do not create a barrier to participation. If the fee would prevent you from participating, please contact Diego at the number or email above and we can discuss waiving the fee.

A hands-on course to help established farmers develop a business plan and financial projections for their farm business. This course covers topics including resource assessment, marketing strategy, financial management, risk management, quality of life, and goal setting. The course is taught by a professional business planner with years of experience working with Massachusetts farms and guest speakers on topics such as succession planning and online marketing. Enrollment is open to farmers who have been operating a farm business in Massachusetts for at least the three prior years, but participating farmers could also have 20-30 years of experience and utilize the course to plan for growth or adding a new enterprise. The Growing Your Farm course has been approved as a certified USDA Farm Service Agency (FSA) borrower training for financial management.

MA FARM SUCCESSION SCHOOL

When: Wednesdays, January 31, February 28, and March 27, 9:30am – 3:30pm

Where: Pittsfield, MA

Registration: [Click here to fill out an interest form.](#) \$100 per farm. It is important to us that course fees do not create a barrier to participation. If any of the course fees would prevent you from participating, please contact the course

coordinators listed above and we can discuss waiving the fee. If you are interested in participating, please fill out the brief interest form [here](#).

MDAR is hosting Land For Good's Farm Succession School for Massachusetts farmers again this winter! This is an opportunity for senior generation farmers - with or without identified successors - to talk with peers, learn from advisors, and get support on the challenging process of farm succession and transfer planning.

Succession planning is a process of exploring how to transfer the farm business and assets to a future owner. Succession School provides farmers and farming partners with the structured and sustained support to make decisions, engage their families, and organize the legal and financial mechanics. Funding is provided by MDAR's Agricultural Business Training Program.

Questions? Contact Jae Silverman at 603-357-1600 or jae@landforgood.org.

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

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