UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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In this issue:

We wrapped up our field trial season a few weeks ago by collecting harvest data on a trial looking at the effects of different mulches on flea beetle damage in broccoli. Keep your eyes peeled for a research report this winter! Photo: S. B. Scheufele

Crop conditions

With cooler temperatures this week and Thanksgiving around the corner, it feels like we're in the homestretch—2020 is almost over, finally. This is normally a very busy time for harvesting root crops, taking soil tests and liming fields, cleaning up the farm, and prepping for big Thanksgiving sales. As with everything else, this holiday season is likely to be different than any previous, with sales being somewhat unpredictable and perhaps lower than average. However, direct support of local farms remains at an all-time high, and we, like you, are hopeful that many will come out to farmstands and winter markets through the winter and sign up for winter CSAs this month.

In Extension, winter means planning, prepping, and putting on educational events. This winter everything will be remote, which may mean that you have an opportunity to attend workshops across the country and learn about topics and techniques from farther afield—ever wanted to attend the Great Lakes EXPO??...now is your chance! But it may also mean that you feel overwhelmed by all the offerings or don't know what is available! As always, we will continue to use the Events Section here and on our website to promote our own events, those that we are co-sponsoring, and those of our regional Extension colleagues, but in this issue we have also put together a list of places to go to seek out high quality educational workshops offered by other organizations this winter. See the sidebar in this issue's Events section for the full list. We hope to *virtually* see you at some of them, and wishing you all a great Thanksgiving!

Pest alerts

Spinach

Cladosporium leaf spot was reported in late-October on 'Kolibri' spinach in Hampshire Co., MA. Since then we have heard several additional reports from around the region. This fungal disease has been reported in field and high tunnel spinach in the past several years but is not well studied. Leaf spots begin as tan and then develop olive green sporulation. Susceptibility varies by variety but no commercial-level resistance has been identified. Disease development is favored by high humidity and cool temperatures (below 70°F). Cladosporium can be seed-borne and can survive on crop residues in soil, but it's not well understood how important either of these routes are in the disease cycle. Once plants are infected, spores are spread by

Cladosporium leaf spot on spinach. Photo: G. Higgins

splashing rain and irrigation water, wind, equipment, and workers. If you grow both field and high tunnel spinach in the fall, till under field residues promptly to slow spread from planting to planting.

Spinach downy mildew causes yellowing on the upper side of the leaf (left) and fuzzy gray sporulation on the underside of the leaf right). Photos: G. Higgins

Four cases of **spinach downy mildew** have been reported across MA and Rhode Island since late-October. Downy mildew pathogens are highly host-specific; the spinach downy mildew pathogen is different from downy mildew of basil, cucurbits, alliums, and other crops. There are 17 identified races of spinach downy mildew, and spinach varieties are resistant to different combinations of those 17 races. It is also possible to have unique "novel" races that have no assigned number. The races of these outbreaks have not yet been identified. In one case in MA, the variety 'Auroch' was affected while 'Kolibri' was not. In another MA case, the variety 'Corvair' was affected while 'Space' and 'Auroch' were not affected. Conventional growers have many fungicide options for management, with programs including Orondis, Revus, Zampro, Ranman, and Actigard, providing complete protection against the pathogen in several University trials. Control with OMRI-listed products is difficult; in one university trial, Timorex Gold (tea tree oil) provided some control, but effects vary widely with environmental conditions. Oxidate may provide some quick knock-down of downy mildew, while Regalia and other plant defense activators may provide some suppression with residual efficacy, especially if used in combination or rotation with coppers, which tend to be the most effective materials for organic growers. See the spinach disease section of the New England Vegetable Management Guide for a full list of labeled products. Resistant varieties remain the best management tool: plant varieties resistant to races 1-17, or plant multiple varieties with different susceptibilities to cover your bases. Let us know if you have spinach downy mildew so that we can get the strain identified and continue working to understand this pathogen better! Call or email us at (413) 577-3976 or umassveg@umass.edu, and join us for a spinach downy mildew virtual field day on January 28 from 3:30-5 pm to learn more and see how this year's variety trial is growing!

Caterpillar feeding damage in high tunnel spinach. Photo: G. Higgins

Caterpillars (likely armyworms and cutworms) are causing damage now in winter high tunnel greens, including spinach. The caterpillars may be hard to find themselves, as they often feed at night, but their raggedy feeding damage and frass is easily noticed. Products labeled for other caterpillar control in spinach should also be effective and can be used in MA.

Brassicas

Brassica powdery mildew was identified on broccoli, kale, and rutabaga on two farms in Hampshire Co. in October. In broccoli, symptoms began as gray-black lesions on petioles with white to gray sporulation present. The disease spread to a nearby kale crop causing similar damage on petioles and leaves. In rutabaga, the disease was not damaging to the harvested crop, but was present on leaves. Powdery mildews are host-specific, meaning that brassica powdery mildew is a different organism than the powdery mildews of cucurbits, tomatoes, lettuce, and other crops. Of the brassica crops, kale is most susceptible to powdery mildew. Most products labeled for Alternaria leaf spot on brassicas are also labeled for brassica powdery mildew; see the brassica disease section of the New England Vegetable Management Guide.

Brassica powdery mildew sporulation on kale (top) and lesions on a kale petiole (bottom). Photos: T. Rusinek (top) and H. Bardwell (bottom).

Root crops

Growers may be noticing **wireworm and grub damage** on root crops being harvested now, or on sweet potatoes coming out of storage. The most effective wireworm management practice is crop rotation. Wireworms take 2-5 years to complete the below-ground part of their life cycle. They thrive in wet, heavy soils that are high in organic matter and are often an issue in fields that were recently turned over from hay or sod, but can build up over the years in other fields as well, because they have a wide host range of vegetable crops. A review of many insecticide trials over 2 decades indicated that organophosphate insecticides applied as a preplant broadcast or in-furrow gave better control than carbamates, and that fipronil and bifrenthrin were as effective as the organophosphates, but with less environmental impact and potential human safety concerns. There are few effective OMRI-listed products but researchers at Cornell University are currently looking into the use of entomopathogenic nematodes for wireworm control, and the product Majestene has a 2ee label for wireworms and grubs in potato and sweet potato.

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

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

The UMass Plant Diagnostic Lab and the UMass Soil & Tissue Testing Lab are both now open. Please see their websites for important sample submission information.

Research Update: Profitability of Frozen Produce in Retail Markets

Is it profitable for farmers in the Northeast to sell high-quality, local frozen fruits and vegetables to the retail market? UMass Amherst Department of Food Science researcher, Amanda Kinchla, and Department of Resource Economics researchers, Dr. Jill Fitzsimmons and Dr. Dan Lass, have been working with a regional food processing facility to find out.

In 2015, the Western Massachusetts Food Processing Center (FPC) in Greenfield, MA added new equipment and frozen storage to develop new freezing capacity for local foods. That March, twenty farmers gathered at the FPC to learn about the facility and discuss the potential for farmers to freeze freshly harvested produce for winter retail sales. While the farmers liked the idea of marketing retail frozen products, there were questions about whether the product could be profitable, safe, and of a high quality. Based on the concerns raised in the meeting, we surveyed Northeast farmers (n=183; 23% response rate), and found that 63% of the respondents were interested in selling frozen retail products, but needed more information about processing/production costs; food safety/quality assurances; consumers' demand/pricing; and packaging/marketing.

Research and development at the Greenfield Food Processing Facility for blueberries. Photos: UMass Food Science Department

To answer these questions, the team secured funding through the NE-SARE

Novel Approaches grant to research whether frozen retail sales could be a profitable market for farm operations in the Northeast.

The two-year project began in 2019. To assess the profitability of frozen produce for farmers, economists Fitzsimmons and Lass conducted a market research choice experiment with consumers to estimate demand for locally processed products. Food scientist Kinchla worked with FPC Manager Liz Buxton to develop non-proprietary standard operating procedures for two safe, high-quality, popular retail frozen fruit and vegetable products, blueberries and spinach. Currently, economists Fitzsimmons and Lass, and FPC Business Manager Kate Venne are estimating food processing/production costs.

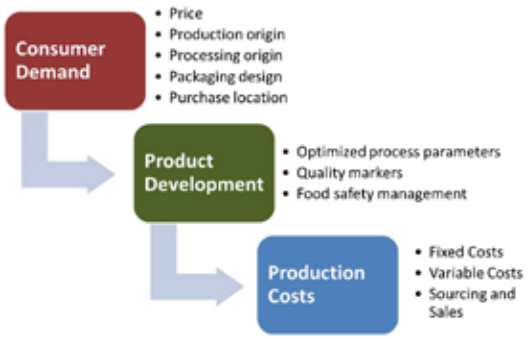

Figure 1. Visualization of the SARE Novel Approaches Grant on frozen produce in retail markets.

Over the course of the next year, the project team will put these pieces of the puzzle together to identify the best options for farmers in the market for frozen foods in the Northeast. Stay tuned to hear the results in early 2021!

--Written by Amanda Kinchla, Extension Associate Professor, Food Science Department

WINTER HIGH TUNNEL ENVIRONMENT: LIMITING FACTORS TO GROWTH

--Written by Andy Radin, URI Cooperative Extension

Your tunnel plantings have all popped and they've been growing. The warm weather has been great. But it's getting darker. And the growth is slowing. Here comes cold. You're probably wishing you seeded just a week earlier. But you can't turn back the clock. Are you doomed?

Here are the environmental parameters that affect your winter crops, ways to modify the environment, and some trade-offs.

Light is the most limiting factor. If you want plant growth in the winter, you'll have to be understanding of the fact that light is the most limiting factor. Unless you supplement with artificial light, you can't change that unless you move to a much lower latitude. So it may help to adjust your expectations by knowing when your plants really won't grow much, and when they will.

A high tunnel, nestled in a cold spot on a farm, with snow clinging to the plastic. Photo: A. Radin

Available light for photosynthesis is a combination of light duration and intensity. The measurement is called the Daily Light Integral (DLI) and is expressed as moles per meter2 per day.* In general, plants grow very slowly or barely at all when DLI is 10 or less, which is generally the case in our latitude and climate from mid-November to mid-February. As we move into March, DLI can reach 20 or more. In June, average DLI in June is in the low 40s in the Northeast and upper Midwest. This link brings you to a really interesting map of DLI for the US. Note that climate also influences DLI (e.g., cloudy precipitation days.)

These measurements reflect conditions directly under the sky. But greenhouse plastic, especially a double layer (which is really important for winter insulation) only lets through 65% to 70% of daylight. So that should lower your expectations even more (for big growth in the middle of the winter.)

For winter growing, the choice of the orientation of your tunnel is no contest: East-West. The long side should be facing south to receive the most sun. And taller crops should be planted in the north beds so they don't shade anything else out.

*Intensity is measured in horticulture as # of photons hitting a unit area per time period. Photons are "light particles". One Mole of particles is 6 X $10^{23}$of them. (You may recall this number from high school chemistry as "Avogadro's Number." A mole of oxygen molecules is 6 X 10^{23} oxygen molecules.)

In second place: Temperature is limiting. It's not a distant second place, either, because there will be no growth with temperatures consistently under freezing. Obviously, it's necessary to choose crops which are hardy enough to withstand subfreezing temperatures without damage. All of these crops can actually tolerate subfreezing temperatures through the following mechanisms:

- By concentrating sugars and other dissolved antifreeze-like compounds in cell sap, the **freezing point is lowered**.
- Water in cells also can move into the intercellular spaces where ice crystals can form without rupturing cell walls.
- Proteins are made in those cells that keep them from being harmed during this cell dehydration.
- The waxy cuticle layer also thickens, though the tunnel environment is often wind-less, so this plays a lesser role.

Mechanisms like these gradually kick in during the acclimation period known as "hardening-off." If you've planted into your tunnels in September, the gradual seasonal change will make this happen. But if plants grown in warm conditions are suddenly plunged into freezing conditions, they won't survive.

We can modify temperature by implementing practices that take advantage of the all-important Greenhouse Effect. First, consider what you get when you have **a clear plastic tent over damp soil in the winter.** If it's daytime and the sun is shining:

- You get warm air.
- If the heat can't easily escape, you get really warm air.
- You get a lot of humidity: water stored in the ground as liquid turns into water vapor that fills the air. The warmer the air is, the more water vapor can be held by the air. Also, the warmer it is, the more water is transpired out into the air by the plants- unless the air is fully saturated with water (100% R.H.) In that case, plants won't transpire. They also won't transpire if the soil is frozen.
- You get condensation on the inside of the plastic cover in the daytime when the moist air comes into contact with the cold surface of the cover. This interferes with light transmission.
- You get storage of heat: the soil and its moisture are a perfect heat sink (mass which can absorb energy.) So you get warm soil, at least within the top few inches of the surface. Energy is not conducted to a great depth, though, because the Earth is a massive mass. Which is a good thing.

On cloudy days, the air doesn't warm up much inside, and the relative humidity does not increase much, either. In fact, such a steady state is better for plant survival than big day/night fluctuations.

Heat loss. If it's nighttime and the sky is clear, heat energy stored in warm masses on the Earth's surface (such as a high tunnel) can freely radiate right through the plastic and out into space. (This is called radiational cooling.) This is usually the primary form of heat loss from a decently sealed-up high tunnel. Heat is also lost (in the form of "long wave radiation") through the plastic and hoops (conductive heat loss) and through gaps that allow warm air to directly escape (convective heat loss.)

On cloudy nights, the cloud layer of water vapor acts like a blanket, holding heat in at the Earth's surface. This keeps the night air from cooling down as much. And that, in turn, reduces the radiant heat loss from the high tunnel. The tunnel cover, itself, does not act like a blanket of clouds.

Inside the tunnel, the soil and other objects re-radiate heat during the night, and that heat passes through the tunnel cover (again, radiational cooling.) Also, the more above-ground mass stored inside the tunnel, the more absorption of heat during the day and re-radiation at night. This is why some people put black barrels full of water inside their tunnels. Remember, though, that they should be along the north side so they don't cast shadows during the day.

Row covering adds another important layer of protection. This is essential for survival of most crops once the temperature gets down below 25°F, though some can survive down to the upper teens. There is no exact trigger temperature to apply row covers but to be safe, go with 35°F. Row covers work as miniature cloudy blankets over your crops: warm, moist air radiates from the soil and condenses on the inside of the cold fabric. It's essential that the covers are suspended over hoops so that the fabric is not in contact with the plants. Not only does this keep leaf surfaces from staying wet for long periods, it also prevents ice on the fabric from being in contact with foliage. If it is expected to get below 20 inside

the high tunnel, a second cover may be necessary. It is very important to put on covers in such a way that makes it easy to remove them on sunny days. Also, cover edges should be fully on the ground to avoid convective heat loss. There are many innovative farmers who have developed assorted systems for this.

As long as you've chosen the right species, crops handle conditions pretty well, although extreme temperatures, low or high, could be injurious. Plants can freeze but they shouldn't be handled until they have thawed, or else they will suffer damage. Though harvest/washing/packing days are somewhat infrequent, monitoring of conditions and consequent chores to ensure plant health and safety are constant. Daily weather conditions will determine your management activities.

Humidity control. As mentioned before, hoops should be installed in preparation for the real cold. Make sure they are spaced closely enough to suspend fabric over the crops. The heavier-weight the cover you use, the more it will sag, especially when soaked with condensation, and the less light will penetrate. In months when the sun is higher (October, February, March), make sure that the temperature under the cover doesn't get above 75°F. Removal of covers would then be required by mid-morning, lest you accidentally cook your crop. Plants cool themselves by transpiring and if roots are sluggish from cold soil while the leaves are warm, it could be a disaster. Cover removal also allows the sun to heat the soil more, which, when covered back over late in the day, holds in heat for the cold night ahead.

Venting of the entire tunnel may also be required for reduction of both temperature and humidity. You don't want condensation on the high tunnel plastic during the day because it interferes with light. It can also keep the foliage wet, which leads to foliar disease. Avoid overwatering: it can lead to an excess buildup of humidity. Again, excess humidity results in wet leaf surfaces and more disease. Much of the soil moisture will hold pretty well through the darkest months when there's little growth, evaporation from the soil surface, or transpiration through the plants.

Cinch down your rollup sides for the winter by mid-October by tucking the end-edges of the rollups into wiggle-wire tracks (to avoid nighttime convective heat loss.) Do your venting from the end walls, either by opening the doors, or having louvre vents near the peaks. High vents are better, both for convective flow and to keep cold winds from blowing on your crops.

Depending on the date (check DLI), full sun may not be strong enough to raise the temperature by very much. In that case, you may choose to vent the tunnel but leave the covers on, or vice-versa. It may depend on whether or not it's a harvest day or how humid the air is. Lots of condensation is a reason to vent the whole tunnel.

Any venting or uncovering that you do has to be put back in place by mid to late afternoon. Hold in any heat you gained during the day. If you can't always be there at the right times, play it safe, based on the weather forecast.

Make use of thermometers so you can accurately assess what's going on, both under the row covers and in the high tunnel space, night and day. (Monitoring tools may be the subject of a whole 'nother article.) Keeping records of temperatures and your management tactics will help you to learn what works best under various conditions through the winter months.

Sources:

Biernbaum, John, 2013. Hoophouse Environment Management: Light, Temperature, Ventilation. MSU Horticulture.

Maynard, Elizabeth and Michael O'Donnell, 2019. Managing the Environment in High Tunnels for Cool Season Vegetable Production. Purdue University.

News

CFAP 2 Application Deadline December 11

Just a reminder that the deadline to apply for the Coronavirus Food Assistance Program (CFAP) 2 is quickly approaching on December 11, 2020. As a reminder, CFAP 2 is a program that provides financial assistance to eligible producers who faced market disruptions and/or incurred costs related to COVID-19. Producers do not have to show evidence of market disruptions and/or additional costs incurred because of COVID-19. You simply must have grown an eligible commodity to participate and all vegetable and fruit crops are eligible commodities under CFAP 2. CFAP 2 is administered by the USDA - Farm Service Agency.

The UMass Extension Risk Management Education Program in cooperation with the Massachusetts Farm Bureau

Federation and the USDA - Farm Service Agency (FSA) put together a Zoom Meeting to go over CFAP 2. Anyone interested in watching the recording can follow the link below to learn more about CFAP 2:

https://us02web.zoom.us/rec/play/rAwAIKrGWMb6Zo_4HCl7gw2X-Waigsxlc_LO151EclvyyAnc7xO-8brkRqwxTp-KTpjDQE2IvnvKmAVmF.OCskSXbG737dO9lr?continueMode=true

Required passcode: 16jhFUy+

As of 11/15/20, 628 Massachusetts producers have received $15.8 million under the "Sales Commodity" category (which includes all fruits and vegetables). Interested producers are encouraged to contact the local USDA-FSA Office that serves their farming operation to apply!

Food Security Infrastructure Grant (FSIG) Program Update

On May 17th, Governor Baker announced the creation of the $36M FSIG Program to make investments in a resilient food system with a goal of ensuring that local food reaches residents in need across the Commonwealth. The FSIG Program seeks to ensure that individuals and families throughout the Commonwealth have equitable access to food, especially local food. The FSIG program was one of the sixteen final recommendations of the Food Security Task Force, based on the current demonstrated need and future long-term resiliency of the Massachusetts food system. The program is also dedicated to helping local farmers, food pantries and community partners, summer meal sites, fisheries, nurseries, and other local producers and participants in the food distribution network adapt to disruptions in the supply chain and fill infrastructure gaps.

The Request For Responses (RFR) was posted on June 10, 2020, with applications being accepted on a rolling basis through September 15, 2020.

The state has seen unprecedented demand for the program. A typical state agency grant program may receive an average of 20-30 applications, with a posting window of two months, a month for review and vetting, and then a few weeks for contract reviews. Due to the urgency and need fulfilled by the FSIG program, which has received well over a thousand proposals, the grant review team has worked to expedite the timeline, while at the same time conducting a thorough review of each application on its merits to address food security.

Awards have been announced in four rounds to-date. (See the full lists of funded projects for the first, second, third, and fourth rounds.) It is anticipated that due to the volume of applications there will be multiple rounds of future grant awards.

If you have further questions about the FSIG program, please email the grant manager at: foodsecurity.grant@mass.gov.

MDAR's MA Farm Energy Program (MFEP)

MDAR's Massachusetts Farm Energy Program (MFEP) has funds to help farms cover audits, energy efficient projects, and select renewable energy projects.

Now is the time to have a technical assessment completed for any energy project you are considering in preparation for upcoming energy grants! You will need a technical assessment to file an energy grant application whether with MDAR or USDA. So start planning now; if you wait until applications come out you may not be able to have one scheduled in time! Remember MFEP pays 75% of the technical assessment, first come, first served. MFEP is providing tele-assessments during this trying time.

Contact MFEP now for more information through the Center for EcoTechnology (CET), MDAR's partner carrying out the MFEP. 413-727-3090, info@massfarmenergy.com, or visit www.massfarmenergy.com, submit a *Request Form*, and then you will be contacted.

Organic Cost Share Reimbursement Program

MDAR is currently accepting applications for reimbursements for USDA Organic Cost Share funds for farmers and food processors. The program includes a new major change - applicants will now receive up to 50% ($500 dollars maximum) reimbursement of total certification cost. Through the USDA Farm Service Agency, funds are available to farms and food companies that are inspected and certified and/or inspected and receiving renewal of certification.

Application deadline has been extended to **December 15, 2020**. *Funds for Handler/Processor certification category

have been fully expended, Handlers/Processors must apply through Farm Service Agency.

Details and application available here. Reimbursements will be available on a first come, first served basis until funds are fully expended. Organic growers may also seek their reimbursement through their local FSA office (only one reimbursement request will be accepted, through either MDAR or FSA, not both). If you have any questions, please contact Keri Cornman, Keri.Cornman@mass.gov.

Two New Collections of Legal Resources Available for Farmers

Food Safety Compliance Legal Resources

These resources, from NECAFS and the Center for Agriculture and Food Systems at Vermont Law School, are available at elsi.necafs.org. The website features fact sheets that answer pressing legal questions about food safety compliance and houses an interactive map illustrating the specifics of each U.S. state's produce safety program, as well as seven fact sheets covering:

- The relationship between FDA rules, guidance, and other communications
- Produce farms, foodborne illness, and legal liability
- Produce Safety Rule inspections and third-party audits
- FSMA PSR coverage and exemptions for farms with multiple business entities
- Alternatives and variances to the Produce Safety Rule
- Using the FDA Technical Assistance Network and the FOIA to access information about FSMA
- Supply chain program requirements for processors and their produce suppliers

Conservation Law Foundation Resource Library of Legal Guides

Conservation Law Foundation's Legal Food Hub has been working to build out its Resource Library of legal guides, which answer common legal questions that farmers, food entrepreneurs, and nonprofits encounter. The following guides, developed in partnership with Klavens Law Group, address issues farmers might face as they shift their business model in response to the pandemic:

- Running a Farmer-Operated Food Hub
- Home Delivery of Farm Products
- Selling Farm Products Through Online Food Hubs
- Sick and Medical Leave During Covid-19: Rights and Obligations explains the Families First Coronavirus Response Act, mandating paid sick, medical, and family leave for employees affected by COVID-19.
- What is Mediation? was produced with Boston Law Collaborative and offers guidance on mediation services that are standing at the ready to assist in conflict resolution.
- Incorporating a Non-Profit in New England is for those of you exploring how to start a nonprofit.

Several of the Legal Food Hub's guides for farmers are now available in **Spanish**:

- Decidir La Estructura Apropriada Para Su Negocio - Deciding on the Right Business Structure
- Exenciones De Responsabilidad Para Actividades Agrícolas Dentro De La Finca - Liability Waivers for On-Farm Activities
- La Negociación Del Alquiler De Sus Tierras – Negotiating Your Land Lease
- Lo Básico De Los Impuestos Sobre El Salario – Employment Payroll Tax Basics
- Cómo Trabajar Con Un Abogado? - How to Work with a Lawyer
- Introducción A La Ley De Cultivo – Introduction to Farm Law

You are encouraged to circulate any and all of these guides widely. And if you have any specific questions pertaining to your business or organization, don't hesitate to reach out to the Legal Food Hub via its website or email legalfoodhub@clf.org.

Events

UNH Webinar: Beginning QuickBooks for Farm Business

When: Mondays, November 30 to December 21, 2020, 6-7:30 pm

Registration: $100. Click here to register for this workshop.

This online course will teach farmers how to set up a bookkeeping system using QuickBooks. This is a beginner-level course, yet those who have some experience may also gain from the recordkeeping concepts that will be covered.

Topics covered in this course include:

- recordkeeping and accounting principles,
- how to record common business transactions in QuickBooks,
- how to utilize reports to guide business decisions.

High Tunnels After Dark: High Tunnel Production Conference

When: Tuesdays, Dec 1, 8, 15, 5-7 pm

Registration: $25. Click here to register for this conference.

Want to fine-tune your high tunnel crop production? This conference is for high tunnel vegetable growers and agricultural service providers of all experience levels. There will be plenty of opportunities to share expertise and learn from one another. Pesticide applicator recertification credits will be available for those who attend live.

- Dec 1: Keynote and Kickoff
- Dec 8: Diseases & Insects in High Tunnels
- Dec 15: Soil, Pest, and Crop Management in Tunnels

Cornell Storage Crop Facility School

Hear speakers from across the Northeast and Midwest present the latest updates and challenges surrounding vegetable storage, including information on storage innovation and updating facilities, decreasing storage diseases, storage funding programs, and farm food safety considerations for storage.

Large-Scale Vegetable Storage (potato and cabbage)

When: Tuesday, December 1 from 9 am to 12:30 pm

Small-Scale Mixed Vegetable Storage

When: Tuesday, December 8 from 9 am to 1:30 pm

Registration: Free ONLINE, registration required. Email Margie Lund at mel296@cornell.edu and include name(s), phone number, email(s) of those attending and which day(s) you would like to attend.

Events Listings from Other Organizations:

Buy-Local Groups

- Berkshire Grown
- CISA
- Central Mass Grown
- Northeast Harvest
- Sustainable Business Network of Greater Boston
- SEMAP
- Island Grown – Martha's Vineyard
- Sustainable CAPE
- Sustainable Nantucket
- Buy Fresh Buy Local – Cape Cod

New England Extension Vegetable Programs

- UMass Vegetable Program Events
- UMaine Extension Events
- UVM Extension Events
- UNH Extension Events
- UConn Extension Events
- URI Extension Events
- Cornell Eastern NY Commercial Horticulture Extension Events

Other organizations

- MA Department of Ag Resources
- Natural Resource Conservation Service
- Northeast Organic Farming Association - MA Chapter

Great Lakes Virtual Expo

When: December 8-10, 2020

Registration: https://glexpo.vfairs.com/en/registration

Over three days, the program includes sessions on fruit crops, vegetable crops, other specialty crops, greenhouse crop production and marketing, farm marketing ideas and operations, farmers' markets and organic production and marketing. There will also be sessions covering a diversity of general interest topics, including food safety and labor.

Presentations will be made by researchers and Extension educators from Michigan State University, other Land Grant universities and industry.

Save the Dates: Southern New England Vegetable Growers Webinar Series!

Join UConn, URI, and UMass Extension for the Southern New England Vegetable Growers Webinar Series!

Webinars will be on alternate Thursdays in January and February of 2021 and open to any and all vegetable growers, topics will include pests of the year, high-tunnel fertility, winter greens production, greenhouse seedling issues, and more! Pesticide credits will be offered at most meetings—watch your inbox for more details and registration to follow, and save the dates below!

- January 14, 3:30-5 pm, Pests of the Year! with Ann Hazelrigg, UVM Diagnostic Clinic, Andrei Alyokhin of UMaine and Ethan Grundberg of Cornell Cooperative Extension
- January 28, 3:30-5 pm, Winter Spinach Field Day with Jim Correll of U.Arkansas and Genevieve Higgins of UMass Extension
- February 11, 3:30-5 pm, Greenhouse seedling production: compost-based potting mix and chemigation with Rosa Raudales of UConn Extension, and Andy Radin of URI Extension
- February 25, 3:30-5 pm, High tunnel fertility research update with Jud Reid of Cornell Cooperative Extension, Shuresh Ghimire of UConn Extension and Andy Radin of URI Extension

UMass Remote Produce Safety Alliance Grower Trainings – Save the dates!

When: Thursday & Friday, January 21 & 22, 2021, 12:30-5:30 pm each day OR

Tuesday & Wednesday, February 2 & 3, 2021, 12:30-5:30 pm each day

Registration information coming soon!

These classes will be offered online using the Zoom platform due to the ongoing pandemic. When you register, you will receive more details, but you must have a computer capable of a videoconference (i.e., sound, webcam, and internet connectivity) to take part in these classes.

Who Should Attend: Fruit and vegetable growers and others interested in learning about produce safety, the Food Safety Modernization Act (FSMA) Produce Safety Rule, farm food safety best practices, and co-management of natural resources and food safety. The PSA Grower Training Course is one way to satisfy the FSMA Produce Safety Rule requirement outlined in § 112.22(c) that requires "At least one supervisor or responsible party for your farm must have successfully completed food safety training at least equivalent to that received under standardized curriculum recognized as adequate by the Food and Drug Administration."

2021 Mid-Atlantic Fruit and Vegetable Virtual Convention

When: February 8-11, 2021

Registration info coming soon

The 2021 virtual Convention will feature four days of three or more concurrent educational sessions. The tentative outline of the sessions can be see here. More detailed program information will be posted after November 15. The sessions will all be recorded so that registrants will be able to access them for several weeks after the Convention.

Virtual Harvest New England Agricultural Marketing Conference and Trade Show

Save the Dates: February 24 and 25, 2021

We'll miss seeing you in person, but are excited to bring you the 2021 Harvest New England Conference with our new on-line format. This unique marketing conference sponsored by your New England State Departments of Agriculture is for New England farmers interested in learning new marketing ideas or fine-tuning strategies for business success. Attended by hundreds of farmers from across the region, this will be the eighth biennial conference.

Look for more details, including keynote speakers and complete agenda toward the end of November at www.harvest-newengland.org.

Thank you to our sponsors!

Become a sponsor!

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