UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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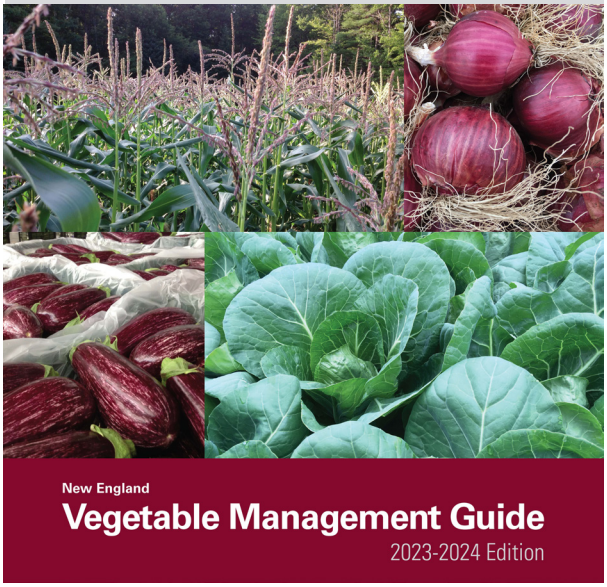


Click on the image for the online Vegetable Guide!

Crop conditions

Welcome to the first Veg Notes issue of 2023! It was great to see so many growers from MA and throughout the region at the New England Vegetable & Fruit Conference in Manchester, NH in December – we had record attendance and it was wonderful to have rooms full of familiar faces eager to learn and socialize. If you'd like to revisit the information from any of the talks, proceedings from the conference, as well as slides from many presentations, are up on the conference website now – see here.

The 2023-24 issue of the New England Vegetable Management Guide is also now available! You can purchase hard copies through the UMass Extension Bookstore. And, as always, the online version of the guide is available for free at nevegetable.org.

Big news in the world of food safety—the compliance dates for management of postharvest water come into effect today for the largest businesses required to comply with the FSMA Produce Safety Rule. There is also a new FSMA rule on product traceability that came into effect this month (affected businesses will have 3 years to comply. For more details, see the article in this issue that covers both topics.

We finally got some snow this past week and hopefully many of you are able to take some time off amidst crop planning and seed orders. If you have concerns about the quality of your seed (maybe you save your own seed and had high disease pressure in one crop), hot water seed treatment is a great tool that will eliminate certain pathogens from in and on seeds. You can treat your seeds at home with some simple equipment, or take advantage of our hot water seed treatment service. Reach out to us for help troubleshooting at-home treatment or with questions about sending us seeds!

Choose resistant varieties

While many of you will have already purchased the bulk of your seed for this coming season, maybe you are still looking for some new varieties to try, or new ways to improve yield and quality in certain crops. We'd like to encourage all of you to consider filling out your crop plans with resistant varieties! Often growers are hesitant to try these unknown varieties because "what if they're ugly or don't taste as good?!" Or "maybe they'll be harder to grow or consumers won't like them because they have unfamiliar names?!" Try planting just one bed with a resistant variety so you can try out the new variety side-by-side and see a) whether it grows better, and b) how it looks and tastes.

Host resistance is one of the cheapest, easiest, and most effective ways to control plant diseases. Actually, I can't think of an easier or more cost-effective way! Disease resistance is bred into plants using classical breeding techniques or through genetic engineering, and can incorporate one or several resistance genes. Plants with more than one resistance gene will

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.

hold up longer against the disease than those with just one. Many resistant varieties will have some resistance against multiple diseases, for example, 'Defiant' is a mid-size slicing, determinate tomato with multiple genes for resistance to late blight and also has resistance to early blight, Fusarium wilt (Races 1 and 2) and Verticillum wilt. There are some situations where using a resistant variety is the best option:

- when there are not effective fungicides available (especially true in organic systems);
- when the disease is vectored by a hard to control insect, (like viruses in cucurbits vectored by aphids);
- where the environment is always conducive to disease (e.g. Fulvia leaf mold in high tunnel tomatoes); or
- when the pathogen can't live outside of its living host (e.g. all the downy and powdery mildews).

Table 1. Fulvia Resistant Tomato Varieties	
Cherry/Grape Type	**Salad/Slicers**
Favorita (J)	Bellini (Sa)
Golden Sweet (J)	Beorange (orange) (J)
Picus (determinate, Roma) (Ba)	Geronimo (J)
Sakura (J)	Pink Wonder (J)
Sunpeach (pink) (J)	Primo Red (determinate) (H)
Sweet Elite (grape) (Sa)	Poseiden (pink) (Ba)
Sweet Gold (yellow) (Sa)	Rebelski (J)
Sweet Hearts (Sa)	Red Deuce (H)
Sweet Treats (pink) (Sa)	Tomimaru Muchoo (pink) (J)
Sources are included for grower reference, no endorsement is expressed or implied for these seed companies. Key to abbreviations: H-Harris, J-Johnny's, Sa-Sakata, Ba-Bayers.	

New resistant varieties are being developed all the time, so check seed catalogs, talk to your seed reps, talk to your neighbors, or check out this extensive list of resistant varieties of many, many crops, maintained by Dr. Meg McGrath, Associate professor of Plant Pathology at Cornell. In the following below are a few examples of where host resistance should definitely be incorporated into your pest management programs. Have fun experimenting!

Table 2. CMV, WMV, and ZYMV resistant cucurbits		
Slicing Cucumber*	**Yellow Summer Squash**	**Zucchini**
Cobra (RS, ST, SW)	Lioness F1 (HM, HO, HS, SW)	Emerald Desire (C)
Darlington F1 (HO, RS, RU, ST, SW)	Conqueror III (HO, ST, SW)	Judgement III F1 (HO, SI)
Perfect 10 (C)	XPT 1832 III (RS, RU, ST)	Justice III (ST)
Perseus (G)	Destiny III (RU)	Dunja (J)
Senor (ST, SW)	Cougar F1 (HM, HO, HS, RS)	Paycheck (J)
Sweet Slice F1 (HO, HS, RHS, TT)	Grandprize (J, HS)	Cash Machine (J)
Bristol (J, HS)	Goldprize (J)	Mexicana (J)
Diamondback (J)	Cougar (J)	
Brickyard (J, HS)		
*This is a very incomplete list, there are SO many slicing cukes with resistance, please consult this table for complete listing		
Seed suppliers: C=Clifton; G=Gurney's Seeds; HM=Harris Moran; HO=Holmes; HS=Harris Seeds; J=Johnny's; RHS= R.H. Shumways; RS=Rispen's Seed; RU=Rupp; ST=Stokes; SW=Seedway; TT=Totally Tomatoes.		

Fulvia leaf mold in high tunnel tomatoes: This is a fungal disease which thrives under warm, humid conditions. If you have ever seen this disease in your high tunnel, you will likely see it every year. It covers leaf surfaces so quickly and thoroughly that fungicides are not effective in controlling it, and it is not possible to reduce humidity enough in the tunnel environment to avoid this disease. Luckily, plant breeders have developed many varieties with resistance to this pathogen! (Table 1.)

Viruses in cucurbits: There are several viruses that regularly affect cucurbit crops which are vectored by aphids, including Cucumber mosaic virus (CMV), Watermelon mosaic virus (WMV), Zucchini yellow mosaic virus (ZYMV) and Papaya ringspot virus (PRSV-watermelon). All four of these viruses are spread by aphids in a nonpersistent manner, meaning that transmission occurs so quickly that even if insecticides are used, they do not prevent transmission from occurring. The varieties listed in Table 2 below are resistant to at least CMV, WMV, and ZYMV.

Downy mildews: These pathogens are aggressive and can really take plants down quickly when the environment is conducive. They tend to blow into the region later in the season so plant resistant varieties for later successions.

Two beds of tomatoes, the left bed with resistance to leaf mold and the right bed with no resistance. Photo G Higgins

Table 3. Downy Mildew Resistant Varieties

Cucumbers*	**Basil***	**Spinach***
Bristol F1 (HS, JO, ST, SW, OS)	Amazel	Sunangel 1-9, 11-19 (JO, ST, SW, OS)
DMR401 (CW, SWI)	Prospera - CG1, ILL2, PL4, PS5 (HS, JO, ST, SW, OS)	Kolibri 1-9, 12-15, 17 (JO, ST)
DMR264 (CW)	Devotion (SW)	Auroch 1-12, 14-16, 19 (JO
SV4719CS (HS)	Obsession (ST, SW, OS)	Dallas 1-18 (OS
Espirit (HS, ST)	Passion (HS, OS)	Corvair, 1-11, 13, 15, 16, 18 (HS, JO)
Citadel (HS, JO, ST, OS)	Thunderstruck (ST)	Kookaburra 1-13, 15 (JO, ST,)
Chaperon (JO, ST)	Pesto Besto (carried by many garden centers)	Space, 1, 2, 3, 5, 6, 8, 11, 12, 14, 16, 19 (HS, JO, SW)
*There are many varieties with resistance to old DM strains (e.g. Marketmore). Choose newer varieties like those above for more complete resistance.	*Older varieties like Eleonor, Emma, and Everleaf now show just intermediate resistance. The varieties above will give at least a few weeks of production after BDM arrives in the area.	*Pathogen exists as races which are listed after variety name. Look for resistance to the most recent races, 15-19.
Seed suppliers: CW= Commonwealth Seeds; HS=Harris Seeds; JO=Johnny's; ST=Stokes; SW=Seedway; SWI=Seedwise; OS= Osborne Seeds		

--by S. Scheufele, UMass Extension Vegetable Program, 2017, updated Jan 2023

GREENHOUSE GASES AND SOIL ORGANIC CARBON IN VEGETABLE PRODUCTION AND THE ROLE OF COVER CROPS

Zach Spangler, Ag Climate Resiliency Specialist, Cornell Cooperative Extension, Harvest New York and Elizabeth Buck, Extension Vegetable Specialist, Cornell Cooperative Extension, Cornell Vegetable Program

The intersection of agricultural production and greenhouse gases is gathering increasing attention. This is an opportune time to consider how vegetable production interacts with carbon sequestration and greenhouse gas emissions, and how using cover crops may alter this picture. Some aspects to consider include:

- Sequestration of atmospheric carbon in agricultural soils as soil organic carbon (SOC).
- Emissions of greenhouse gases such as carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) from the soil.
- Greenhouse gas emissions associated with agricultural inputs.

Attempts to combat climate change in vegetable production can target any of these areas, however they should not come at the expense of yield. In fact, the surest ways to reduce greenhouse gas emissions overall are to increase yield while keeping inputs constant or reduced, or to maintain yield while decreasing inputs.

Soil Organic Carbon Impacts

What is soil organic carbon?

Soil organic carbon (SOC) refers specifically to the carbon content of soils, not including large materials (> 1/16”). SOC is a portion of soil organic matter (SOM) and is easier to measure. Often, SOC is thought to be ~58% of SOM, though this is not an exact number and can vary with soil type and other factors. SOM (and by extension SOC) is critical in water infiltration, water holding capacity, moderating soil temperature, supporting soil microbes, and more. Increasing SOC is also a way to fight climate change by sequestering carbon in the soil; even small changes in SOC spread over large areas make a big difference.

Current research’s view of SOC and vegetable production

Various studies have reached differing conclusion on the overall impact of vegetable production on SOC. One model-based study of ten years of organic vegetable production showed that carbon is lost from the soil at a rate of 660 lb C/ac/yr. On the other hand, a study of 11 yrs of high tunnel vegetable production in China found that conventional methods increased SOC by 450 lb/ac/yr and organic methods increased SOC by 3500 lb/ac/yr in the top 8” of soil. A broad analysis of exiting research confirmed a difference between conventional and organic methods. The higher sequestration rates in organic contexts may partially be because these farms import carbon in the form of compost and other organic fertilizers.

Net Greenhouse Gas Emissions

How does net greenhouse gas (GHG) accounting work?

It is important to consider GHGs besides CO_2 to get a full understanding. In agriculture, this includes nitrous oxide (N_2O) and methane (CH_4). This is especially true since N_2O is about 300 times as bad as CO_2 and CH_4 is about 30 times as bad. When multiple GHGs are emitted, the overall impact can be expressed as an equivalent amount of CO_2 or CO_2-eq. In vegetable production, direct emissions of CH_4 are usually minor, so the focus here is on CO_2 and N_2O.

Sources and estimates of emissions for vegetable crops

There is no definitive answer to what the net GHG emissions are for raising produce or whether/how much vegetable crops are contributing to building SOC. This variation is driven by what crop is being grown, what methods (e.g., fertilizer type, tillage intensity, cover cropping) are used, how long those methods have been used, soil type, climate, and more. One study modelling all the GHG emissions associated with organic vegetable production in Western Washington found that between 0.045 and 0.623 lb CO_2-eq were emitted per lb of produce for crops like onions, squash, dry bush beans, potatoes, and chard.

Frequent tillage associated with intensive vegetable production exposes soil organic matter and enables the release of CO_2 through soil mineralization. Essentially, the frequent exposure to oxygen burns off the organic matter and turns it into CO_2 which reduces SOC levels. Compost application offers an attractive way to sequester carbon and increase

SOC, in part because the carbon in compost is relatively stable and less likely to turn back into CO_2. This is because as the compost was produced, the portion of the organic matter that would easily decompose did so, releasing some CO_2 in the process. The CO_2 emissions associated with compost production usually occur at off-farm facilities and don't count in the farm's carbon footprint.

The Impact of Cover Crops…

On soil organic carbon

There is a little more clarity when considering the impact of a specific management practice such as cover cropping. One study of cover cropping over eight years of intensive organic vegetable production showed that increasing cover cropping frequency from 1 in 4 years to every year increased the SOC in the top 12". This study showed that planting a legume-rye, mustard, or rye cover crop all increase SOC levels by similar amounts. It also demonstrated that, regardless of how often cover crops are grown, compost application increased SOC levels.

A 9-year study of cover crop introduction to vegetable production in southern Ontario, Canada showed that cover cropping increased SOC in the top 6" of soil. At one site, oilseed radish used as cover crop increased SOC from 28 to 36 tons C/ac.

It's also important to consider the full soil profile when thinking about carbon sequestration. One study measured SOC over a 20-year period in a corn-tomato rotation system with and without cover crops. Addition of cover crops increased SOC in the top foot of soil, however SOC decreased in the top 6 feet. In this case, the cover crops may have been successful if the goal was to improve soil health. However, if the goal was to sequester carbon, then the cover crops were not successful.

On nitrous oxide emissions

A well-established benefit of cover crops is their ability to reduce nitrate in run-off leaving the farm. Because this nitrate could result in N_2O emissions later on, reducing nitrate loads in run-off may also reduce GHG emissions. Nonlegume cover crops had little to no net impact on N_2O emissions measured over a full year in several research studies.

A lab research study (see Table 1) measured soil emissions of N_2O for 47 days after the incorporation of various cover crops. Overall, incorporating residue from legume cover crops led to much higher N_2O emissions than non-legume cover crops. Wet soil caused higher emissions regardless of cover crop. In wet conditions with this soil, non-legume cover crop residue led to lower emissions than no residue, possibly because the oat straw tied up nitrogen, making it unavailable for N_2O production.

A field trial confirms the idea that wet soils with legume cover crops incorporated led to increased N_2O emissions. Over 4 months, plots where hairy vetch residue had been tilled in showed high N_2O emissions of up to 7 lb N_2O/ac/day compared to virtually no emissions from 50 lb-N/ac synthetic N fertilizer or no fertilizer.

Nitrogen cycling is an intricate process. Different microbe types produce different forms of nitrogen-based compounds, and each kind thrives in certain soil conditions. Microbes that are active in wet soils tend to produce N2O. They can experience a population boom when a lot of high-N content food is available in wet soils.

Table 1. Nitrous Oxide (N_2O) emissions over 47 days (relative units) *

Cover Crop Treatment	Dry Soil	Wet Soil
No residue	0	6,000
Legume (pigeon pea)	100	10,000
Non-legume (black oat)	5	2,000

*Adapted from "Soil N_2O Emissions Following Cover-Crop Residues Application under Two Soil Moisture Conditions"

Taken together these studies indicate that N_2O emissions can be limited by maintaining drier soils, particularly when incorporating legume cover crops. In general, not incorporating cover crop residues (i.e., leaving them as mulch) and using nonlegume species minimizes N_2O emissions.

On other GHG emissions

Cover crops can reduce net GHG emissions in other ways too. For example, in a study of tomato production in Maryland, cover crops (hairy vetch or crimson clover) were terminated by flail mowing and the residue was left in place as a mulch replacing black plastic. The use of the cover crop residues as mulch increased marketable yield of tomatoes and allowed nitrogen fertilizer application to be halved. This is a great example of reducing GHG emissions by maintaining or – in this case – increasing yield while reducing inputs.

Final Message

The overall impact of vegetable production on soil carbon and greenhouse gases is very complex and depends on many specific factors. The role of cover crops was explored here, however fertilizer and tillage also impact net GHG emissions.

- Over years, cover cropping can help build SOC, at least at the surface.
- Non-legume cover crops, and all cover crops in dry soil, have minimal N_2O emissions.
- Cover cropping can improve yield and reduce input requirements thus reducing emissions per unit of production.

Additional information on the benefits of cover crops and guides to help select cover crop species can be found at: https://covercrop.org.

The full version of this article, including source references, can be found at https://rvpadmin.cce.cornell.edu/uploads/doc_1096.pdf

FSMA UPDATES: ENFORCEMENT BEGINS FOR POSTHARVEST WATER REQUIREMENTS; NEW TRACEABILITY RULE EFFECTIVE

Key points:

- Large growers covered by the FSMA Produce Safety Rule (find out if that includes your farm) **must begin taking water tests this year** for any untreated ground water sources used for **postharvest** activities such as produce washing, handwashing, or cleaning food contact surfaces
- There are **proposed changes to pre-harvest** water requirements. We'll keep you posted about the finalized pre-harvest water rule and compliance timeline when they're available
- A new Final **Traceability** Rule became effective **January 20, 2023**—growers covered by the rule (find out if that includes your farm) must keep supply chain tracking information for products on the Food Traceability List, starting in 2026

POSTHARVEST WATER REQUIREMENTS

FDA is ending its enforcement discretion for the **postharvest water** provisions of the FSMA Produce Safety Rule. This means that produce safety inspectors—in Massachusetts, this is the MDAR Produce Safety Inspection Program—will begin enforcing the requirements in this part of the rule on the following timeline:

- January 26, 2023, for **large businesses**
- January 26, 2024, for **small businesses**; and
- January 26, 2025, for **very small businesses**

Farm business sizes are classified according to annual sales. If you're unsure if you have to comply or what size your business is, use UMass' tool here: Do I Need to Comply with the FSMA Produce Rule?.

The Produce Safety Rule requires that water used for harvest and post-harvest activities must have no detectable generic *E. coli* in a 100 ml sample. These activities include water used for …

- Washing or cooling produce that's covered under the Produce Safety Rule
- Contacting food contact surfaces (e.g., for cleaning and sani-

Postharvest water must start with no detectable generic E. coli. and be maintained to be of adequate sanitary quality for its use. Photo L. McKeag

tizing)

- Making ice that will contact covered produce
- Handwashing

To ensure water used for these activities meets the microbial quality criterion of no detectable (0 CFU or MPN) E. coli per 100 ml water sample, the rule includes the following requirements for harvest and postharvest activities:

- **Cannot use untreated surface water**
- **Untreated ground water** - test 4 or more times during the growing season or over the period of a year
  - 1 or more tests per year after initial year if all tests are 0/not detectable
  - If any annual test fails to meet this criterion, you must discontinue use of the water, make any necessary changes, and/or treat the water until the criterion is met, and resume testing at least 4 times per year until all results collected in a year meet the criterion
- **Public water supply** – Have copy of test results or current certificate of compliance

For **large businesses**, the compliance date for these requirements begins January 26, 2023—that's today! If this is you, this doesn't mean you need to have 4 test results or a public water supply compliance certificate in hand today; it means that you should **take your 4 samples over the course of the 2023 growing season.**

If you'd like help with water testing, understanding how these changes might impact your farm or with implementing other food safety practices, contact Lisa McKeag, 413-658-8631 or lmckeag@umass.edu. A map of labs that can test water samples for generic *E. coli* can be found here.

FDA has stated that for the first year of compliance, they intend to work closely with state and industry partners (e.g., MDAR, Extension) to advance training, technical assistance, and educational visits prior to initiating routine inspections for these requirements.

FSMA requirements for pre-harvest water are still pending. Photo L.McKeag

PRE-HARVEST WATER REQUIREMENTS

In December 2021, FDA issued a new proposed rule regarding pre-harvest agricultural water that would replace some of the provisions finalized in 2015. The proposed rule did not change the requirements for postharvest water, described above, but made significant changes to the requirements for pre-harvest activities (including irrigation, crop sprays, and frost protection), for farms that are required to comply with the FSMA Produce Safety Rule (find out if you need to comply here).

The **original rule** stated that farms required to comply with the FSMA Produce Safety Rule must create a microbial water quality profile (MWQP) for each agricultural water source used for any **pre-harvest activities**. The MWQP would consist of results from 20 water samples over 2-4 years for each surface water source, with 5 additional samples taken annually thereafter, and 4 samples in the first year for each ground water source, with one additional sample annually thereafter.

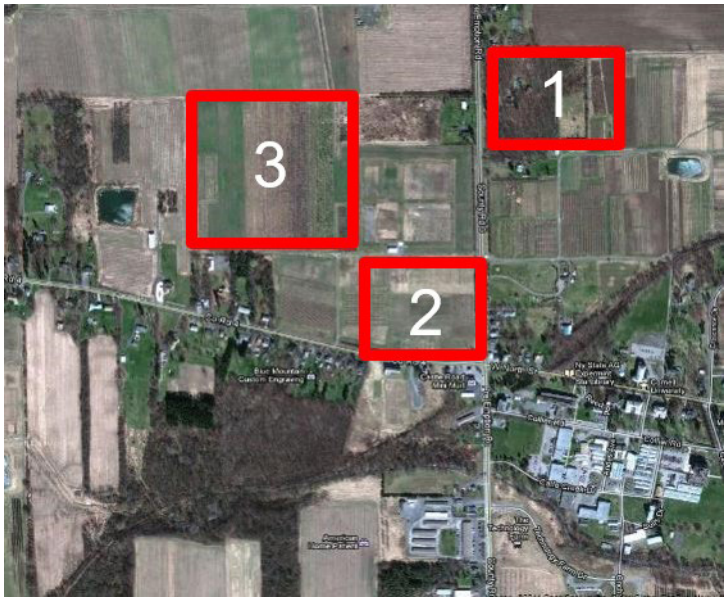
The **proposed rule**, if finalized, would eliminate the testing requirement for pre-harvest water and replace it with a requirement to conduct a **pre-harvest agricultural water assessment for each water source at least once annually.** Growers would be required to consider certain factors in their assessment including the degree to which the system is protected from contamination, the type of application method used, crop characteristics, and relevant environmental conditions. The assessment could also include results of water testing, though it doesn't specifically require testing and does not set specific microbial criteria for pre-harvest water.

We're eagerly waiting for FDA to release a final version of the rule, which may include some changes from the pro-

posed rule based on input FDA received through the public comment process. As with the postharvest provisions, enforcement will be tiered according to business size and the largest growers will have 9 months after the publication of the final rule to come into compliance. As soon as it's released, we'll let you know!

NEW TRACEABILITY RULE

Growers covered by the Food Safety Modernization Act's Produce Safety Rule may be affected by a new FSMA rule requiring traceability records be kept for some crops. The FSMA Food Traceability Rule, proposed in September of 2020, was released in its final form in November 2022 and became effective a few days ago—on January 23.2023. All farms covered by the rule will have 3 years to come into compliance (until January 20, 2026). To find out if this rule applies to your business, see the FDA's exemption tool here.



The Traceability Rule requires certain records be kept for products on the Food Traceability List including a farm field map and traceability lot codes to help identify products in the food supply. Photo Produce Safety Alliance

The rule requires growers (and other food producers or handlers within the food supply chain) to keep certain records for products on the Food Traceability List. Growers covered by the Produce Safety Rule should be aware that the list includes fresh melons, peppers, cucumbers, leafy greens, and herbs, along with fresh-cut produce, and other products such as some cheeses, nut butters, shell eggs, and sea food.

Required records include:

- A traceability plan
- Farm map (to field level) for items on the list
- Traceability lot codes
- An electronic searchable spreadsheet
  - if annual sales under $250,000, don't need to keep electronic spreadsheet
  - Still need to have information available for an inspector in the event of an outbreak investigation

FDA's goal is to prevent illnesses and food system disruptions by being able to identify and remove products implicated in outbreaks more quickly. For certain events within the food supply chain process (what FDA calls "Critical Tracking Events" or CTEs), manufacturers, processors, packers, or holders of items on the list must keep certain records or "Key Data Elements" or KDEs.

The CTEs are:

- Harvesting
- Cooling
- Initial Packing
- Shipping
- Receiving
- Transforming

The data elements, or KDEs will depend on the event (CTE). For example, for **Harvesting,** records containing information about the …

- Commodity/variety
- Quantity

- Harvest location (farm/field)
- Date of harvest

… must be associated with the product. CTEs and KDEs are connected by a **Traceability Lot Code**. This is some identifier, usually an alpha-numeric code, that is created by a grower or packer and that follows the product through the supply chain to the consumer.

Exemptions to the rule include:

- Produce farms with average annual sales ≤$25,000 (if your farm is fully exempt from the Produce Safety Rule, it is exempt from the Traceability Rule)
- Food produced and packaged on the farm
  - Packaging must remain in place until the food reaches the consumer
  - Packaging must maintain integrity of the food and prevent subsequent contamination
  - Labeling that reaches the consumer must include farm name, address, and phone number
- Food sold directly to consumers by the farm

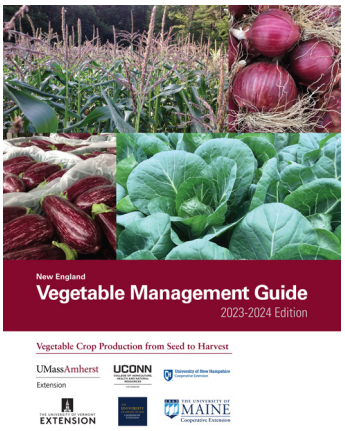
It is early days yet for this new rule and inspectors, educators, growers, packers, and distributors will all need to get up to speed over the next 3 years to figure out how this will impact everyone within the food supply chain. FDA has said that, as with the Produce Safety Rule, they intend to take an "educate before and while we regulate" approach to the roll-out of this rule. They, along with state Extensions and other educational organizations will provide trainings and tools to help growers and others understand and comply with the rule. In the meantime, anyone can ask questions or make comments directly to FDA through the FSMA Technical Assistance Network.

Again, contact UMass (Lisa McKeag, 413-658-8631 or lmckeag@umass.edu) if you need help with produce safety. You can also stay up to date with FSMA news and training opportunities by subscribing to the Northeast Center to Advance Food Safety (NECAFS) and the Produce Safety Alliance (PSA) newsletters. And of course, through Vegetable Notes!

--By Lisa McKeag, UMass Extension Vegetable Program, 2023

News

Revised New England Vegetable Management Guide Available Now!



Click on the image to order online!

The 2023-2024 Vegetable Guide is now available for purchase from the UMass Extension Bookstore: https://extensionsalesportal-umass.nbsstore.net/

A collaborative project of the Cooperative Extension vegetable programs in the six New England States, this guide provides both conventional and organic commercial vegetable growers, on small and large farms, with up-to-date production and pest management information.

The 2023-2024 New England Vegetable Management Guide is a comprehensive guide to current production and pest management techniques for commercial vegetable crops. There are in-depth sections on cultural practices, vegetable transplant production, integrated pest management for insects, weeds and diseases, and on individual vegetable crops.

Buy the Guide by itself, or as a package with the Northeast Vegetable & Strawberry Pest ID Guide. The Pest ID Guide contains over 200 full-color images of the weeds, insects, diseases, and disorders that may be affecting your crops, and beneficial insects too. The Pest ID Guide is an indispensable companion to the Veg Guide, and you save when you buy them together! (Note: the Pest ID Guide was not updated for this year, so if you already have this book you can hang onto that one).

Guide pricing:

2016-2017 New England Vegetable Management Guide alone:	$40.00
Northeast Vegetable & Strawberry Pest Identification Guide alone:	$15.00
Veg Guide & Pest ID combo pack:	$50.00

As always, the online version of the Guide is also accessible for free at http://www.nevegetable.org, where you can also download a pdf of the Pest ID Guide.

2022 New England Vegetable & Fruit Conference Presentations and Proceedings are Now Online!

We were glad to see so many of you in person at the 2022 New England Vegetable & Fruit Conference in December! The proceedings and Powerpoint slides from the presentations are now available on the conference website, here.

MDAR Food Security Infrastructure FY2024 Grant (FSIG) Program RFR Posted

This program seeks to ensure that farmers, fisherman and other local food producers are better connected to a strong, resilient food system to help mitigate future food supply and distribution disruption, as well as ensuring that individuals and families throughout the Commonwealth have access to food, with a special focus on food that is produced locally and food that is equitably accessible. Deadline March 2, 2023.

COMMBUYS direct link here

FSIG Program details here

Rural Energy For America Program (REAP)

The next REAP deadline for renewable energy and energy efficiency grants and loan guarantees is March 31, 2023. For more information on applying, click here, and please note that **the percentage of project costs applicants can request has recently increased from 25% to 40%**. MFEP will be hosting a webinar about applying to this grant in February, so be on the lookout for more information, coming soon. If you have questions about the REAP grant in the meantime, email the Massachusetts Farm Energy Program or call 413-727-3090.

CISA Climate Mitigation & Adaptation Mini-Grants

CISA offers grants of up to $3,000 on a rolling-application basis to support farms and farm-related businesses implementing or expanding practices that foster adaptation to climate change and contribute to the resilience of the local food system. Funds can be used for consultations with experts, project design and planning, grant writing, and general advice and mentorship from CISA's technical assistance providers and other farmers.

Those interested in improving and/or implementing climate change adaptation practices and who demonstrate a commitment to building an inclusive and resilient food system are encouraged to apply now. Grants are open to Massachusetts farmers in Hampshire, Hampden and Franklin Counties.

To learn more, click HERE. To apply for a loan, complete the Climate Change Adaptation Grant Application Form or contact Stephen Taranto at 413-665-7100, ext. 17.

Pesticide License Renewal Time

Please be reminded that Massachusetts Pesticide Licenses expire each calendar year. MDAR uses the publicly accessible online system known as the EEA ePLACE Portal and no longer sends the hardcopy renewal forms via U.S. Mail. Please renew your license online using this system. You should have received an email reminder on Sunday, October 2nd asking you to renew your pesticide license. If you have not done so, please visit the EEA ePLACE Portal, log into your account, and complete your renewal. If you forgot your password or security questions or otherwise need help logging into your account, please contact the ePLACE Help Desk at (844) 733-7522. If you have questions or issues renewing your pesticide license, please send email to pestexamlicense@mass.gov. You may also leave a voice message at on the Pesticide Examination and License Hotline at (508) 281-6787.

New pesticide license applicants will need to create an EEA ePLACE Portal Account and register for their exam. Cre-

ating an account in the Portal is a simple process. Each account is specific to the individual applicant. While companies may sponsor their employees, they CANNOT create a company account on behalf of their employees. Follow the instructions in this presentation to register. Please visit MDAR's Examination and Licensing website to find helpful step-by-step guides and information for all your pesticide examination and licensing needs.

EEA ePLACE Portal - https://eplace.eea.mass.gov

New Factsheets on Soil-Water Monitoring Released by UMaine and UVM

The University of Maine Agroecology Lab, UMaine Extension, and University of Vermont Extension recently released two new fact sheets designed to explain the basics of soil water availability, relevant technology (hardware and software), and costs associated with these practices. We hope these factsheets are useful to growers and agricultural advisors.

Events

TOMORROW! No More Normal: A Farmer Roundtable Discussion on Climate Adaptation

When: January 27, 2:00 pm - 4:00 pm

Where: Plainville Farm, 135 Mount Werner Road, Hadley MA

Registration: Free, but please Please RSVP here to ensure there are enough chairs and refreshments for all!

Let's face it– there is no more 'normal' growing season anymore. The first and last frosts are erratic, and precipitation is all over the place– heavy rains one summer and droughts the next. Join American Farmland Trust's New England Climate and Agriculture team, Wally Czajkowski (Hadley, MA), and Bryan O'Hara (Lebanon, CT) for a farmer roundtable discussion of strategies and ideas for building resilience on our farmlands. Wally and Bryan will kick off the discussion by sharing some of their observations from their many decades of farming experience, and a few practices they've tried in order to improve outcomes on their farms. This event is geared toward mechanized vegetable farms of medium to large scale; both conventional and organic strategies will be discussed.

This is a farmer-focused, peer-to-peer event. AFT Staff will provide refreshments, logistics, and detailed note-taking so you can have access to notes from the conversation after the event.

UMass Extension's Invasive Insect Webinar Series 2023

When: Wednesdays from 9:00am-11:45pm: January 25, February 8 and February 22

Where: Online

Registration: Free! Please register in advance for each workshop. To register and find more information about individual sessions and pesticide credits, click HERE.

Join UMass Extension's Landscape, Nursery, and Urban Forestry Program and UMass Extension's Fruit Program presents for this series of FREE webinars focusing on the impact, monitoring, and management of invasive insects in Massachusetts and the nation! Topics to include spotted lanternfly updates, management, and entomopathogens; forest pest risk re. climate change; the beech leaf disease nematode; and invasive forest insects. Please note: while participants from anywhere are invited to attend, much of the material presented will be specific to Massachusetts and New England.

MDAR Spotted Lanternfly Webinar

When: Wednesday, February 15, 2023, 10-11:15am

Where: Online

Registration: Free! Click here to register.

Join the MA Department of Agricultural Resources for a quarterly webinar on the topic of spotted lanternfly. The goal of this webinar is to provide the green industry, environmental groups, and other interested parties with the latest

information about spotted lanternfly occurrences, survey updates, and more.

This webinar has been approved for 1 MA pesticide license credit (ALL categories and license types!). The webinar is also eligible for the following education credits: 1 MA Forestry or Timber Harvesters License credit, 1 MCA credit, 1 MCH credit, 1 MCLP credit, ¾ ISA credit, or ½ MQTW credit. To qualify for pesticide license credits you MUST register with your license information and a unique email address, stay for the duration of the course, and answer all poll questions.

Northeast Cover Crops Council Annual Conference

When: Thursday, February 16, 2023

Where: Portland, Maine - Holiday Inn By the Bay (88 Spring St, Portland, ME)

Registration: Registration for the conference is $75 for farmers and students and $100 for all others. Financial support is available to eligible registrants. To see the full schedule and to RSVP, visit https://northeastcovercrops.com/event/northeast-cover-crops-council-annual-conference. Meals during the conference will be provided. Attendees are asked to RSVP online. The deadline for hotel discounted rates is Feb 1.

The Northeast Cover Crops Council (NECCC) annual conference is open to farmers, students, extension agents, crop consultants, and other agricultural professionals. Look forward to concurrent tracks covering a range of topics to include:

- Economics and financial opportunities of cover cropping
- Diversifying species and applications of cover crops
- Advanced cover cropping methods for vegetable systems
- The role of cover crops in climate change adaptation and mitigation
- Precision Sustainable Agriculture (PSA) project highlights
- And more!

Attendees will also be able to take part in a poster presentation where students, researchers, and agricultural professionals will share their research. Continuing education credits will be available for Certified Crop Advisors (CCAs)

2023 New York Farm Show

When: February 23-25

Where: New York State Fairgrounds in Syracuse NY

Registration: Admission is free by visiting your Northeast Equipment Dealer by Feb. 15; otherwise, it is $5 at the door and those under 18 are free. Free parking and free shuttle buses run all day to all six farm show buildings.

The largest farm equipment show in the Northeast is back for its 38th year in Syracuse on Feb. 23-25. The New York Farm Show continues to grow, and this year it will add thirty new products and eighteen new exhibitors to maximize 300,000 square feet across six heated buildings. Over 400 exhibitors will display the latest in farm equipment, tractors, combines and farm implements; seed and crop protection products; farm supplies, dairy and beef productions, woodlot, and related industry supplies. The event will also include a full line of educational sessions from the New York Beef Producers and New York Forest Owners Association.

For additional information, visit www.NewYorkFarmShow.com and follow the New York Farm Show on Facebook.

NEVBGA & Cooperative Extension 605th Growers' Meeting

When: Saturday, February 25, 2023, 9:00am-3:15pm

Where: Wilson Farm, 10 Pleasant St., Lexington, MA 02421

Registration: There is a $20 registration fee, which is waived for members of NEV&BGA. Lunch buffet is an additional $20. To register, please RSVP to 978-423-6694 or secretary@nevbga.org by February 22nd.

Join NEVBGA and New England Cooperative Extensions for a day-long workshop! Topics include:

- Agriculture in Chile
- URI Variety Trial Report
- Maine's response to the discovery of PFAS in agricultural soil, water, and products
- Update on squash and strawberry disease research and changes to the NE Vegetable Management Guide
- Farm labor focus group
- Food Safety: cleaners, disinfectants, and sanitizers

For a full agenda, click HERE. *2 Pesticide recertification credits has been approved for this meeting.*

SEMAP 16th Annual Agriculture and Food Conference

When: Sunday, February 26th, 8am to 4pm

Where: Virtual

Registration: Register here. Tickets will be sold on a sliding scale and you should choose the level that makes sense for you; if cost is still a barrier, scholarships will be available. Please email shickey@semaponline.org for more information.

Farmers, foodies, and agricultural advocates alike are all welcome. Join us for a day of engaging virtual workshops on topics ranging all across the food and agricultural space. More info here.

UMass Extension Landscape Nursery and Urban Forestry Program, 44th Annual Community Tree Conference

When: February 28, 2023, 8:45 am - 3:45 pm

Where: Online (live webinar via zoom)

Registration: $75. Click here to register.

The theme of this year's conference is Community Forestry in Changing Times: Climate, Sustainability, and Environmental Justice.

This one-day conference is designed for tree care professionals, volunteers, and enthusiasts including arborists, tree wardens, urban foresters, foresters, landscape architects and shade tree committee members. This year's topics include: using citizen-science to study trees and air quality, the Boston Urban Forest Master Plan, bringing tree equity to urban areas, the PowerCorps Boston Green Skills Program, the MA Greening the Gateway Cities Program, and updates on disease and insect pests of trees and shrubs. Click here to see the full agenda.

Two pesticide contact hours for categories 29, 35, 36, and Applicators License. 2 MCA, 2 MCLP, 1 MCH, 5.75 ISA, 5.5 (cat 1) SAF, and 5 (cat 1) CFE credits available.

Questions? Contact Ellen Weeks at weeks@umass.edu.

2023 Virtual Get Ready for Spring Greenhouse Program, Part 2

When: Thursday, March 2, 2023, 8:30 AM – 12:00 PM
Where: Online!

Registration: $25 per person, register and find more info HERE

Join us online on for Part 2 of our Get Ready for Spring Greenhouse Series. It is a half-day virtual education program that will equip you with knowledge and skills you can put to use in the 2023 growing season. You did need to attend Part 1 in order to attend Part 2. More info available HERE.

Topics:

- Managing Pests and Diseases in Retail Settings
- Water Testing: How to Interpret Results and Match Fertilizer Selection with Water Quality
- How to Manage Bacterial Diseases in Greenhouse Ornamental Crops

- Gracious support from the Massachusetts Flower Growers Association has reduced participation fees for these events as a benefit to the industry.

Two pesticide credits in categories 26, 29, 31 and 000 have been approved for each program date. Credits are valid for equivalent categories in all New England states.

Contact Geoffrey Njue at gnjue@umass.edu or 617-243-1932 with questions.

2022-2023 Update on Honey Bee Health in the Commonwealth

Join MDAR's Crop and Pest Services (CPS) Division, Apiary and Forest Pest Education and Outreach Team, to get an update on honey bee health in the Commonwealth. Each event will include 1-2 presentations consisting of 90 minutes of content and 30 minutes of Q&A for attendees. Presentations will cover information and data focused on regulations, honey bee health, beekeeping practices and invasive pests. Events will be held virtually via Zoom on Tuesdays from 7pm-9pm and are free and open to the public.

- March 7, 2023 - MA Beekeeping Laws and Regulations – Including the NEW Regulations, and Spring Into Beekeeping
- March 14, 2023 - Massachusetts Bee Aware Annual Honey Bee Health Survey, and USDA-APHIS Annual Honey Bee Health Survey
- March 21, 2023 - Spotted Lanternfly, and Northern Giant Hornet (formerly know as Asian Giant Hornet)

Pre-Register for the Zoom Webinar and a link will be automatically sent for the presentations.

Ag Day at the State House Set for April 12, 2023!

Agriculture Day at the State House will take place on Wednesday, April 12, 2023 from 10AM to 2PM. MDAR is excited to have the opportunity for farmers and growers to return to Beacon Hill to meet with lawmakers to promote and discuss all the issues impacting the agricultural industry in Massachusetts. Thanks to those who have already replied expressing interest in serving on the planning committee. If you would like to be involved in the planning of Ag Day, please email Phu Mai at Phu.Mai@mass.gov with your contact information and agricultural affiliation. MDAR hopes to convene a meeting of the committee sometime this month before Thanksgiving. As one of the marquee days of the year at the State House, MDAR is looking forward to working with stakeholder groups to make Ag Day 2023 one to remember!

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