



UMass
Extension

Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



Volume 27, Number 24

December 10, 2015

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CROP CONDITIONS

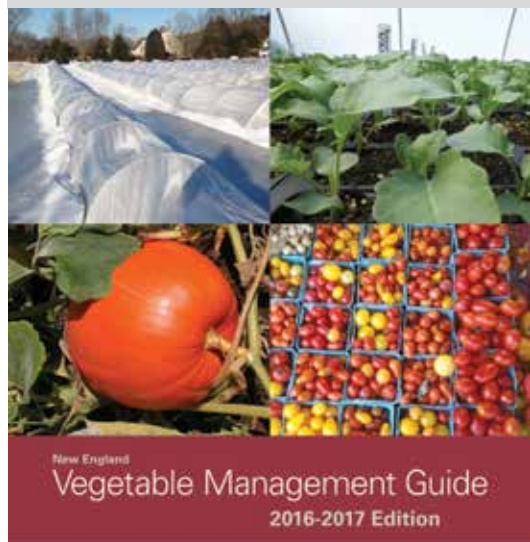
This seems to be the season that will never end! Greens are still being picked out of the field while high and low tunnels are catching up leading to an abundance of greens. Farm stands are still offering items such as broccoli, kale, lettuce, and the standard storage crops such as: carrots, beets, turnips, potatoes, sweet potatoes, onions. While many farm stands have closed for the season, some are leaving self-serve stands open where items are priced at nice round numbers to make shopping easy for the customers. Sales from a self-serve stand for the entire month of November may equal one day in July, but some growers think keeping the stands stocked is a goodwill gesture to their customers. Many of you are likely looking forward to the New England Fruit and Vegetable Conference next week not just for the excellent workshops, but also to compare notes with each other as you plan for the next season. The conference is a great opportunity to talk to equipment dealers, seed companies, and others in the industry to make purchasing decisions for next season but also a chance for shop-talk with other growers or maybe even an Extension Educator! We look forward to seeing many of you next week.

[Vegetable Program Survey](#)

I have been traveling the state this fall visiting with many of you at meetings (CRAFT, MFBF, NEVBGA, NOFA, SEMAP) to give an annual update of the Vegetable Program and to gather your input on our priorities via this survey. Your responses will help us adapt the UMass Extension Vegetable Program to better suit your needs. The survey should take you about 5 minutes to complete.

Click here to access the survey: <https://www.surveymonkey.com/r/UMass-Veg>

Click here to read our annual report: [2015 UMass Vegetable Program Annual Report](#)



Cover of the updated NE Vegetable Management Guide. Pick one up for spring! See notice in this issue to find out where to buy it.

Thanks!

Katie Campbell-Nelson

GROWING MUSTARD AS A BIOFUMIGANT COVER CROP

The process of 'biofumigation' with brown mustard (*Brassica juncea*) can reduce weed pressure, populations of parasitic nematodes, and soil-borne pathogens such as *Pythium*, *Rhizoctonia*, *Sclerotinia*, *Verticillium* and *Phytophthora*. Brassica plants contain glucosinolates that, when broken down, produce biocidal compounds called isothiocyanates which are similar to metam sodium, the active ingredient in the commercial fumigant Vapam. Brassica crops vary in the amount and

types of glucosinolates they contain, and varieties have been bred to improve their biofumigant effects. With a fairly short growing period of about 60 days and tolerance to cool temperatures, brown mustard can be grown successfully as a spring cover crop prior to seeding fall vegetable crops, or as a short season summer cover crop in a fallow field to prepare an area for the following year's crop. Costing around \$5.00/lb, brown mustard seed is cheaper than traditional fumigants such as methyl bromide, which are being phased out.

Greenhouse bioassays were conducted in 2014 and 2015 using mustard-biofumigated soils from the UMass Research and Education Farm in Deerfield, MA and from a commercial farm in Hadley, MA. Pepper plants were planted in fumigated, non-fumigated, or sterilized soil and were inoculated with *Phytophthora capsici*. In our studies, plants grown in mustard-fumigated soils tended to get disease more slowly than plants grown in sterilized soil, though this finding was only significant in 2015. While the effects of fumigation are reported to last up to 10 days, the suppression of *P. capsici* may last up to a month, or long enough to harvest from a pepper or summer squash crop in mustard-fumigated fields compared to non-fumigated fields. In another on-farm trial during the summer of 2015 in Taunton, MA, mustard biofumigation was not shown to significantly reduce the population of plant parasitic root-knot and lesion nematodes in a field into which strawberries were then planted because distribution of plant parasitic nematodes is known to be very patchy. However, under more controlled conditions in other greenhouse studies, results do show significant reduction of nematodes with biofumigation.

Precautions: Biofumigation is not a silver bullet, and must be used as part of an integrated program, so growers must continue to manage their pests in other ways. Mustard cover crops are host to many of the same pests that attack other brassica crops. Farms that grow a lot of brassicas may wish to avoid growing mustard, or at the very least, plan it into the crop rotation in order to avoid planting fields with brassicas consecutively. Brown mustard was observed to be highly attractive to flea beetle in trials conducted at UMass in 2014 and 2015. Brown mustard is also susceptible to *Alternaria* leaf spot and Black Rot that can overwinter on crop residue. When used as a biofumigant, mustard has been shown to reduce parasitic nematode populations, however, it is also a host to these same nematodes. If not correctly managed, mustard can keep these pests in the field to infest the next cash crop host.

Follow these steps to ensure a bio-fumigation success!

- 1. Buy the seed.** We have found several suppliers of brown mustard, and several species bred for fumigation. One variety that has been bred for increased isothiocyanate production is "Caliente" (*Brassica juncea*) and it is available from High Performance seed company through Siegers Seeds and Seedway. Another brand is 'Pacific Gold' from Mighty Mustard available through Johnny's Seeds.
- 2. Select a field** with a pest shown to be affected by biofumigation with mustard. The entire process from planting and incorporating the mustard until the field is ready for another crop will take 60-70 days depending on weather, so select a field that you don't need for other crops in that amount of time. The best times to seed this mustard in New England are late April before a main season crop such as pumpkin or late August, in order to prepare a field for the following year's crop such as strawberry. Mustard will tolerate cool temperatures and can germinate in soils that are 45-50°F.

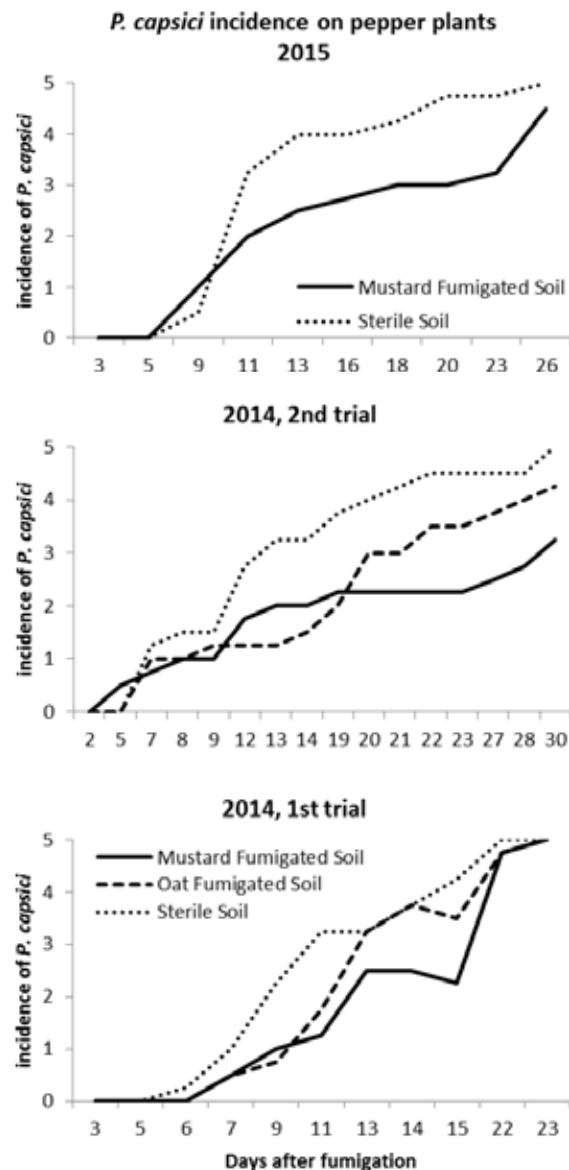


Fig 1. When we analyzed disease development over time (area under the disease progress curve), we found that there were no differences between fumigated and other soils in 2014, but in 2015 the difference between fumigated and sterilized soil was significant ($p = 0.0061$).

3. **Prepare and fertilize** your field with a plow or disc and broadcast 50-80 lb. nitrogen/acre and 20-30 lb. sulfur/acre immediately prior to planting. Nitrogen is needed to increase biomass, and sulfur is recommended to increase production of isothiocyanates by the mustard. Maintaining a soil pH of 6-7 is important during this process. If the soil is too acidic when the mustard is turned under, the crop will *not* release fumigating properties, but rather act as a green manure. If the soil pH is within the 6-6.5 range, apply gypsum for sulfur in a neutral form. If the soil pH is 6.5-7, ammonium sulfate may be used to provide N and S but it will acidify the soil.

4. **Seeding** can seem intimidating because the seed is so small and light. However, here are several effective methods:



1) A no-till grain drill (photo) may be used to seed at a rate of 9 to 12 lbs/acre, 0.25-0.75" deep, in rows 6-8" apart. Adding kitty litter to the hopper may help improve seeding and germination.



2) Using a Brillion Sure Stand (photo) or a Stanhay seeder at 12-15 lbs/acre can be effective if the soil is moist, but in a dry year, the brillion will simply push piles of soil over the seed, burying it too deeply.



3) Broadcasting seed with a fan spreader (eg. a Vicon Seeder) is also an effective alternative to the grain drill but more seed will be needed (15-20lbs/acre). After spinning seed on, follow with just the rollers on a Perfecta cultivator (photo) touching the soil surface to lightly cover the seeds.

5. **Chopping, incorporating and sealing:** About 60 days after seeding, the mustard should be at peak bloom, but not too woody. All three steps of this process must be completed as quickly as possible in order to maximize fumigation, preferably before rain is expected. If it does not rain, irrigate the field after incorporation to keep the isothiocyanates from volatilizing into the air.



1) Use a flail (photo) or rotary mower to chop the plant tissue while the mustard is at peak bloom.



2) Immediately incorporate the residue with a chisel plow, rototiller, or heavy disc (photo).



3) Seal the soil surface immediately after incorporation with a heavy board, roller, or culti-packer.

6. **Plant your main season crop** 10 days or more after incorporation as that is how long the fumigation lasts. Be careful not to reintroduce the target pathogens before planting a main season cash crop. Follow other cultural or chemical practices to manage target pests since biofumigation is only one tool in your toolbox.

TAKING STEPS TO PROTECT YOUR SEED

One of the most common recommendations we give to farmers is to “buy seed from reputable sources” or “buy certified disease-free seed.” Starting with quality seed will give you a great advantage in producing a healthy, productive crop. Bad seed results in no or slow germination, meaning you have to re-seed and start over or your stand is uneven and yields lowered. Sometimes germination is bad because of how the seed was harvested, cleaned, and stored—maybe there were contaminants, the seed wasn’t graded for size or color, or seeds were too dry or too moist during storage. You don’t have much control over these things, except to buy from a reputable seed source. But you do have some control over the other major reason that seeds germinate poorly--pathogens. Seed crops are in the ground for a long time, and it can be hard to maintain disease-free crops, as you all know. Pathogens not only infect leaves and stems, many can also infect the seedpod, and grow on and into the seed itself. Fruit that is diseased may produce seed that is also contaminated. Bacteria, fungi, viruses, and oomycetes can all be transmitted this way, on the seed surface or within the seed itself. The first thing you can do is ask your seed supplier questions such as, “Did you test this seed lot for presence of _____ disease?” or “Was _____ disease present in this seed crop while it was growing?” and so on.



Pathogens growing on germinated untreated seeds in the lab. Photo S. Scheufele

The second thing you can do is clean it up yourself (or send it to us to treat). Many seeds can be sterilized by soaking in water that is hot enough to kill pathogens within the seed, but not hot enough to damage the seed. The process is a bit exacting, and you will benefit from getting some special equipment if you plan to process a lot of seeds this way. For specific instructions on hot water treating your own seed see this [factsheet](#) prepared by Cornell and Rutgers Cooperative Extensions. Or if you prefer, the UMass Extension Vegetable Program is now offering a mail-in hot water seed treatment service. For details, pricing, and order forms please visit our online services website [here](#). Not all seed can be treated, but small-seeded crops for which there are many known seed-borne pathogens such as tomato, pepper and brassicas are good candidates. Below is a list of hot water-treatable seeds and common diseases that can be eradicated using this method.

Crop	Diseases Controlled
Brassicas	Alternaria leaf spot, Bacterial leaf spot, Black leg, Black rot
Beet / Swiss Chard	Phoma/Canker, Downy Mildew, Cercospora leaf spot
Carrot	Alternaria leaf blight, Bacterial leaf blight, Cercospora leaf spot, Crater rot/foliar blight
Celery / Celeriac	Bacterial leaf spot, Cercospora leaf spot, Septoria leaf spot, Phoma crown and root rot
Eggplant	Anthrachnose, Early blight, Phomopsis, Verticillium wilt
Lettuce	Anthrachnose, Bacterial leaf spot, Lettuce mosaic virus, Septoria leaf spot, Verticillium wilt
Onion	Purple blotch, Stemphylium leaf blight, Basal Rot, Botrytis blight, Smudge, Black mold
Pepper	Anthrachnose, Bacterial leaf spot, Cucumber mosaic virus, Pepper mild mosaic virus, Tobacco mosaic virus, Tomato mosaic virus
Parsley / Cilantro	Bacterial leaf blight, Alternaria leaf blight, Black rot, Cercosporoid leaf blight, Septoria blight
Spinach	Anthrachnose, Cladosporium leaf spot, Cucumber mosaic virus, Downy mildew, Fusarium wilt, Stemphylium leaf spot, Verticillium wilt
Tomato	Alfalfa mosaic virus, Anthracnose, Bacterial canker, Bacterial speck, Bacterial spot, Cucumber mosaic virus, Early blight, Fusarium wilt, Leaf mold, Septoria leaf spot, Tomato mosaic virus, Verticillium wilt, Double virus streak

Table 1. Vegetable crops and seed borne pathogens control by hot water treatment.

Thirdly, you can disinfect seeds by soaking in bleach or other sanitizer to remove pathogens on the seed **surface**, or you can treat your seed with a fungicide, whether synthetic or biological in nature, to protect germinating plant from pathogens within the seed.

Surface Sterilize: Disinfection of seed with chlorine bleach effectively removes pathogens that are present only on the seed surface. Agitate seed in a solution of 20% Chlorox (e.g. 20 oz/100 oz water) for one minute. Use 1 gallon of disinfect-

tant to one pound of seed. Rinse seed thoroughly in cold tap water for 5 minutes, dry, and test for germination (see below).

Fungicide seed treatments: Fungicides, whether synthetic or biological, may be applied as a powder mixed in with seed in the hopper, as a slurry, or as a soak, according to label instructions. Remember to always wear the personal protective equipment required by the label when treating seed but also when handling treated seed. Do not use treated seed for food or feed purposes or process for oil. Treat only those seeds needed for immediate use, minimizing the interval between treatment and planting. Do not store excess treated seeds beyond planting time. Again, you will want to dry seeds after soaking or applying a slurry, and then test for germination (see below).

Biocontrol organisms: can protect against seed-borne (or soil-borne) pathogens and improve plant performance. There are several such products available commercially, most are species of bacteria in the genera *Bacillus* (Taegro, Double Nickel, Serenade, Sonata, etc.) and *Streptomyces* (e.g. Mycostop or Actinovate), or they are fungi in the genus *Trichoderma* (e.g. Rootshield, Bioten, etc.). Please be aware that these products will not have been tested on every possible crop seed, so efficacy cannot be guaranteed and it is wise to do a test batch first to ensure germination is not affected. Another way to utilize biofungicides to control seed or seedling diseases is to amend soil or potting mix with the material—this might be an easier way to apply the material uniformly. Please remember to wear personal protective equipment when treating seeds and handling treated seeds; powdered biofungicides can be especially unpleasant to breathe, so get out your respirator.

Synthetic Fungicides: are often used as seed treatments to protect seedlings from pathogens present in soil (mostly from damping-off pathogens) but will also protect seedlings from fungal pathogens that were present in the seed. Fungicides such as thiram, captan, mancozeb, fludioxonil, metalaxyl-M, azoxystrobin and PCNB are used commonly in vegetable seed protection. Most seeds come already treated and will be brightly colored and come with a warning label on the seed packet. Many companies are developing seed treatments comprised of multiple fungicides and/or insecticides and often growers can choose which treatments they'd like to have added to their seed. Below are listed some of the more common commercially available seed treatments and what they control:

Product	Active Ingredients	<i>Pythium</i> spp.	<i>Phytophthora</i> spp.	<i>Rhizoctonia</i> spp.	Fungi, broad spectrum	Compatible with Rootshield	Insecticide
Thiram, Charter, Signet, etc.	Thiram	✓	✓	✓	✓	?	
Captan	Captan	✓	✓	✓	✓	✓	
Ridomil Gold, Apron XL	Metalaxyl-M/ mefenoxam	✓	✓			✓	
Mancozeb	Mancozeb				✓	?	
Maxim 4FS	Fludioxonil			✓		?	
Dynasty	Azoxystrobin			✓	✓	?	
FarMore300	Metalaxyl-M + fludioxonil +azoxystrobin	✓	✓	✓	✓	?	
FarMoreI400	Metalaxyl-M + fludioxonil +azoxystrobin +thiamethoxam	✓	✓	✓	✓	?	✓
Cruiser	thiamethoxam					✓	✓
CruiserMaxx (legumes)	Thiamethoxam + Metalaxyl-M/ mefenoxam + fludioxonil		✓	✓		?	
CruiserMaxx (potato seed)	Thiamethoxam + fludioxonil			✓		?	✓

Germination Testing

It is a good practice to conduct a germination test on seed stored for more than one year, on your own saved seed, or on seed that has been hot water treated. Primed, chemically-treated and pelleted seed may also be germination tested, but be sure to wear gloves when handling chemically treated seed. A germination test will also help you determine if in-field germination problems were due to bad seed, or if environmental conditions or a field pest was the culprit. Unlike hot water seed treatment, a germination test can easily and accurately be completed on the farm without special equipment. You will need 2 weeks to complete the test.

Your germination test can be done in a moist chamber, or any place that is warm and dark, but where the seeds won't dry out quickly. To conduct the test, prepare two 8" x 8" squares of blotting paper or heavyweight paper towels for each seed lot you will be testing. Spray the paper towels until moistened with warm tap water, but not too moist, especially for melon seeds which rot easily. If you have a small seed lot, place 25 seeds, evenly spaced on one moistened surface. If an accurate count is needed, use 100 seeds and larger paper towels. Cover the seeds with the second paper towel and gently place inside a gallon-size ziplock bag. Do not seal the bag completely—leave a 3" section unzipped. Clearly label each bag. For best results, place the bags on a greenhouse heating pad. Keep the heating pad temperature at 75°F, or see Table 2 and use the optimum germination temperature for each variety. Germination of many Solanaceous seeds is inhibited by natural gas, so do not place tests for these seeds near gas stoves or water heaters. Check on the seeds daily, re-moistening the towels as needed. After 7 days, count the total seeds with vigorous germination and record the number. Repeat this again after 14 days. Take the average of the 2 germination totals and use that number to calculate the % germination. Averaging the germination rates will take into account seed that is more vigorous (germinating after 7 days) and seed that may be less viable (after 14 days).

Germination standards are provided by the rules and regulations of the Federal Seed Act and can vary widely. For example, carrots may be sold commercially with a germination rate of 55%, while cucumbers must be at 80% germination. It is up to you what germination rate you are willing to put up with in your fields, but a minimum of 75% is common.



Fig 2. Germination test of hot water treated and untreated Siberian Kale saved from a field infested with *Alternaria*. The treated seed germinated more quickly than the untreated.

VEGETABLE	MIN. (°F)	RANGE (°F)	OPTIMUM (°F)	MAX (°F)
BEAN	60°	60° - 85°	80°	95°
BEAN LIMA	60°	65° - 85°	85°	85°
BEEF	40°	50° - 85°	85°	95°
CABBAGE	40°	45° - 95°	85°	100°
CARROT	40°	45° - 85°	80°	95°
CAULIFLOWER	40°	45° - 85°	80°	100°
CELERY	40°	60° - 70°	70° ^z	85°
CHARD SWISS	50°	50° - 85°	85°	95°
CORN	50°	60° - 95°	95°	105°
CUCUMBER	60°	75° - 95°	95°	105°
EGGPLANT	60°	40° - 80°	85°	95°
LETTUCE	35°	40° - 80°	75°	85°
MUSKMELON	60°	75° - 95°	90°	100°
OKRA	60°	70° - 95°	95°	105°
ONION	35°	50° - 95°	75°	95°
PARSLEY	40°	50° - 85°	75°	90°
PARSNIP	35°	50° - 70°	65°	85°
PEA	40°	40° - 75°	75°	85°
PEPPER	60°	65° - 95°	85°	95°
PUMPKIN	60°	70° - 90°	95°	100°
RADISH	40°	45° - 90°	95°	95°
SPINACH	35°	45° - 75°	70°	85°
SQUASH	60°	70° - 95°	95°	100°
TOMATO	59°	60° - 85°	85°	95°
TURNIP	40°	60° - 105°	85°	105°
WATERMELON	60°	70° - 95°	95°	105°

Table 2. Soil Temperature Conditions for Vegetable Seed Germination. Compiled by J.F. Harrington, Dept. of Vegetable Crops, University of California, Davis. ^z Daily fluctuation to 60° or lowers at night is essential.

FOOD SAFETY MODERNIZATION ACT (FSMA) PRODUCE SAFETY RULE FINALIZED

The Food Safety Modernization Act (FSMA) is federal legislation designed to protect US consumers from food-borne illnesses by preventing contamination of fresh fruits and vegetables at the producer and processor levels. FSMA is comprised of seven foundational rules for implementation:

- **Preventive Controls for Human Food** – *final rule issued September 10, 2015*
- Preventive Controls for Animal Food – *final rule issued September 10, 2015*
- **Produce Safety** – *final rule issued November 13, 2015*
- Foreign Supplier Verification Program – *final rule issued November 13, 2015*
- Third Party Certification – *final rule issued November 13, 2015*
- Sanitary Transportation – *final rule due by March 31, 2016*
- Intentional Adulteration – *final rule due by May 31, 2016*

The first two rules proposed as part of the law – Preventive Controls for Human Food (often just referred to as the Preventive Controls Rule) and Produce Safety – have been the most controversial, and are the two with the greatest potential to impact farmers and produce processors. The FDA held listening sessions and accepted comments on these rules after they were initially proposed in 2013, and made adjustments to the provisions based on feedback from growers and other members of the concerned public. Major areas of contention were the testing requirements for agricultural water, restrictions on the application of manure as a soil amendment, and the appropriateness of requirements for farms of different scales. The final Preventive Controls Rule, which deals with food safety in produce processing facilities, was finalized in September (see the [November 5, 2015 issue of Veg Notes](#) for more on the Preventive Controls Rule). Now the long-awaited final version of the Produce Safety Rule – which establishes standards for the growing, harvesting, packing, and holding of fresh produce – has been issued.

View the [FSMA Final Rule on Produce Safety](#) on the FDA's website.

Compliance dates for the Produce Rule vary depending on the size of the operation. The largest farms – those with average annual gross sales of produce over \$500,000 – will be expected to comply two years after the effective date of the final rule (January 26, 2016), while smaller farms will have either 3 or 4 years to comply, depending on their annual sales. There are several conditions for exemption from the Produce Rule, including being a farm with an average annual value of produce sold during the previous three-year period of \$25,000 or less, or producing only crops that have been identified by FDA as “rarely consumed raw”. Many farms in MA will be exempt from the rule, or eligible for a qualified exemption. (See the National Sustainable Agriculture Coalition blog post “[Understanding FDA's New FSMA Rule for Produce Farms – Part 1](#)” for a good overview of the conditions for these exemptions.)

The [Produce Safety Alliance](#) – a collaboration among Cornell University, FDA, and USDA – is developing a standardized curriculum with which to train Extension personnel and others to be able to guide fresh produce growers in meeting the regulatory requirements of the Produce Safety Rule. UMass Extension will participate in this training, and is working to prepare resources with which to assist MA growers.

See the Events section for information on the FDA's ONLY listening session planned for the Northeast. This will be your chance to ask questions about the new rules.

-by Lisa McKeag, UMass Extension Vegetable Program

2016-2017 NEW ENGLAND VEGETABLE MANAGEMENT GUIDE AVAILABLE NOW!

When purchasing your inputs for next year, don't forget to pick up a copy of the **NEW New England Vegetable Management Guide**, just updated for 2016-17. 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 2016-2017 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**. Fertility and pesticide information has been fully updated for both **organic and conventional production**.

Purchase copies of the Guide at the [UMass Extension Bookstore](#), or through one of the other New England state Extensions. The UMass Extension Bookstore's updated on-line portal allows you to purchase items directly from their website using a MasterCard or Visa, or by printing your confirmation and mailing it in with a check. You can also order by phone by calling 1-877-UMASSXT (within MA) or 1-413-545-2717.

Buy the Guide by itself, or as a package with the NE 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, along with photos to help you identify beneficial insects. The Pest ID Guide is an indispensable companion to the Veg Guide, and you save big when you buy them together!

Guide pricing:

2016-2017 New England Vegetable Management Guide alone:	\$25.00
Northeast Vegetable & Strawberry Pest Identification Guide:	\$15.00
Veg Guide & Pest ID combo pack:	\$30.00

****Get a free copy of either the New England Vegetable Management Guide or the New England Small Fruit Production Guide with [membership in the New England Vegetable & Berry Growers Association \(NEVBGA\)](#) – the oldest growers' association in the United States. You can also pick up a copy at the [2015 New England Vegetable and Fruit Conference](#), December 15-17 in Manchester, NH (see the Events section for details).**

EVENTS

[FDA Public Meeting in New England: Food Safety Modernization Act Final Rules](#)

When: Monday, December 14, 2015 from 9:30 am to 3:00 pm

Where: Latchis Theatre, 50 Main Street, Brattleboro, VT 05301

Join FDA subject matter experts for an overview of three final Food Safety Modernization Act (FSMA) rules:

- Produce Safety
- Preventive Controls For Human Food
- Preventive Controls For Animal Food

... And ask YOUR questions about what the rules cover and who must comply.

This is the only public meeting that the FDA will hold on final FSMA rules in the Northeast!

Free and open to the public. No registration required. This event is accessible to people with disabilities. For more information or to request accommodations such as seating, interpreting, etc., call (802) 522-7811 or email kristina.sweet@vermont.gov in advance of the event.

[The 2015 New England Vegetable and Fruit Conference](#)

When: Tuesday, December 15 to Thursday, December 17, 2015

Where: Radisson Hotel – The Center of New Hampshire, 700 Elm St, Manchester, NH 03101

New England Vegetable & Fruit Conference and Trade Show includes more than 25 educational sessions over 3 days, covering major vegetable, berry and tree fruit crops as well as various special topics. A Farmer to Farmer meeting after each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues. There is also an extensive Trade Show with over 100 exhibitors.

This conference is special because it is put together with close collaboration between growers and Extension from across the region. The steering committee gathers the best speakers from within our region and across the country to tell you about the latest innovations and advances in the fruit and vegetable industry. Almost every session includes both farmers and research or extension personnel, so you are getting the “best of both worlds.” [On-line registration is open!](#)

December 15-17th

NEVF
New England Vegetable & Fruit

Conference 2015

[New England Vegetable & Berry Growers Winter Meeting](#)

When: Friday, January 8, 2016 from 9:30am to 3:30 pm

Where: Hadley Farms Meeting House, 41 Russell Street, Rte 9 (in the Hampton Village Barn Shops), Hadley, MA 01035

This is the 590th meeting of the NEVBGA, and the first of two winter meetings hosted by NEVBGA and the Cooperative Extension programs of New England, and co-sponsored by UMass Extension Risk Management/Crop Insurance Program. This all-day program will feature presentations on:

- Effectively Managing Mildews in Cucurbits by Meg McGrath, Cornell Cooperative Extension
- Employment Law by Frank Di Luna, Partner, Murtha Cullina Law Firm
- Growing Mustard Cover Crop as a Soil Biofumigant by Katie Campbell-Nelson, UMass Extension
- Update on the new New England Vegetable Management Guide
- and more!

Open to all! There is a \$20.00 registration fee. This fee is waived for members of NEVBGA. Optional hot buffet lunch available for an additional fee.

**Pesticide recertification credits will be requested.

Register and reserve your lunch by December 23 by contacting:

Lisa McKeag at 917-573-5558 or secretary@nevbga.org

[Connecticut Vegetable & Small Fruit Growers' Conference](#)

When: Monday, January 11, 2016 from 8:00 am to 3:30 pm

Where: Maneeley's Conference Center, 65 Rye St, S. Windsor, CT 06074

This all-day program will feature a trade show and presentations on complying with labor laws, heat-treating seeds for disease management, effects of environmental extremes on crop physiology, berry weed management, irrigating vegetable and small fruit crops, growing for a CSA, and an update on brown marmorated stink bug.

**Pesticide recertification credits have been requested.

Registration is \$40 per person by January 6, \$60 after January 6. Contact MacKenzie White at mackenzie.white@uconn.edu, or 860-875-3331.

[Introduction to HACCP](#)

When: Tuesday, January 12, 2016 to Thursday, January 14, 2016

Where: UMass Amherst 102 Holdsworth Way, 243 Chenoweth Laboratory, Amherst, MA 01003

This course covers the fundamentals of HACCP (Hazard Analysis Critical Control Point) and is taught by certified International HACCP Alliance instructors. This particular course will have an emphasis on fresh-cut produce, beverages (including juice and cider), baked goods, and dairy products. The concepts will be reinforced by breakout group activities in which participants will have the opportunity to prepare a HACCP plan. All participants will receive an International HACCP Alliance certificate issued through the University of Massachusetts upon successful completion of the course.

Course topics will include: HACCP overview Prerequisite Programs, Overview of the Seven Principles, Sanitations and SSOPs, Biological, Physical, and Chemical Hazards, Conducting a Hazard Analysis, Determining Critical Control Points, Establishing Corrective Actions, Establishing Monitoring, Establishing Verification & Validation Procedures, Documentation Practices & Record Keeping, Regulatory Issues, Auditor Expectations

For guests that are traveling out of the area, we have a room block rate of \$125/night at the UMass Hotel until December 14th. The code is HAC15C and guests can either reserve online (<http://www.hotelumass.com>) or call 877-822-2110.

[Biological Control in Greenhouses - Success is in the Details!](#)

When: Tuesday, January 12, 2016 from 9:30 am to 3:00 pm

Where: Publick House, 277 Main St, Rte 131, Sturbridge, MA 01566

Co-sponsored by UMass Extension Greenhouse Crops & Floriculture Program and UConn Extension Greenhouse IPM Program. Features presentations on preventing aphid breakouts, scheduling biocontrols, pesticide compatibility with biocontrols, and a grower-to-grower session.

**4 pesticide recertification credits are available.

Contact: Tina Smith, UMass Extension, 413-545-5306 or Leanne Pundt, UConn Extension, 860-626-6240

[NOFA-Mass Winter Conference](#)

When: Saturday, January 16, 2016 from 7:30 am to 7:30 pm

Where: Worcester State University, 486 Chandler St, Worcester, MA 01602

This annual one-day conference features 70 workshops and exhibitors; an all-day seminar and keynote speeches with Ben Burkett, family farmer and coordinator of the Federation of Southern Cooperatives; children's conference and more. All workshops are approved for AOLCP accreditation.

Look for these talks from UMass Extension personnel:

- **Plant Disease Update: 2015 Year in Review, 9am** - Susan Scheufele, UMass Extension Vegetable Program
- **Biopesticides: How, When and Why to Use Them, 1:30pm** – Susan Scheufele, UMass Extension Vegetable Program
- **Assessing and Managing Agricultural Risks on Your Farm, 9am** – Tom Smiarowski and Paul Russell, UMass Extension Risk Management Specialists

[Vermont Vegetable & Berry Growers Association Annual Meeting](#)

When: Wednesday, January 25, 2016

Where: Lake Morey Inn, 1 Clubhouse Rd, Fairlee, VT 05045



This all-day program will feature presentations on a wide variety of topics, including community accreditation for produce safety, writing a nutrient management plan, bed-steaming tunnel soils for weed and disease management, pests to look for in 2016, vegetable variety trials, and more.

Sponsored by: USDA, Risk Management Agency and Farm Service Agency, Vermont Compost Company, Vermont Agricultural Credit Corporation, University of Vermont Extension, and the VVBGA.

Registration is \$40 for VVBGA members, \$50 for non-members and includes morning coffee break and a hot lunch buffet. Pre-register by January 22! Add \$10 for walk-in registration.

[New England Vegetable & Berry Growers Winter Meeting](#)

When: Saturday, February 6, 2016 from 9:30 am to 3:30 pm

Where: location in Eastern MA, to be determined

This is the 591st meeting of the NEVBGA, and the second of two winter meetings hosted by NEVBGA and the Cooperative Extension programs of New England, and co-sponsored by UMass Extension Risk Management/Crop Insurance Program.

This all-day program will feature presentations on:

- Pollinator health from the new MA Apiary Inspector, Kim Skyrn
- Research Update on Organic Fertilizers for High Tunnel Tomatoes by Andy Radin, URI Extension
- Update on the new New England Small Fruit Guide
- and more.!

Open to all! There is a \$20.00 registration fee. This fee is waived for members of NEVBGA. Optional hot buffet lunch available for an additional fee.

**Pesticide recertification credits will be requested.

Contact Lisa McKeag at 917-573-5558 or secretary@nevbga.org to register and request lunch, or for more information.

THANK YOU TO OUR SPONSORS



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

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