



UMass  
Extension

# Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



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## IN THIS ISSUE:

- Crop Conditions
- Managing Aphids in Early Season Tunnels
- Understanding the Nutrient Management Regulations
- New England Vegetable Management Guide – corrections & product registration updates
- News
- Events
- Sponsors

## CROP CONDITIONS

Spring fever is upon us. Running in many directions at once all headed for the same moment; when the first crop of the season is planted in the field. Growers are hurriedly fixing up equipment, cleaning out greenhouses, dealing with flood damage caused by recent rains in some areas, and sowing the first seeds in the greenhouse. Over the last few weeks we have seen high numbers of aphids in greenhouses and tunnels where crops were grown through the winter—it is important to control these populations early, before they really take off, in order to protect future crops and seedlings from feeding damage. Many growers are making final decisions about which field rotations to follow this year after considering pest pressure from last season. Others are purchasing their fertilizer amendments for the season, and at least one grower was spotted in the Pioneer Valley plowing. Keep in mind there are new plant nutrient regulations in Massachusetts when making your fertilizer purchases this year. For example, if your soil test results are high

in phosphorous, look for low or no P containing fertilizers such as 8-3-3 pelletized chicken manure instead of 5-4-3, or consider eliminating a triple super phosphate application in several rows in order to compare results. See the article and event listing for Pittsfield, MA in this issue on ‘Understanding the Nutrient Management Regulations’ for more information. Let us know if you’d like to see a similar event in Eastern Massachusetts! While making many of the decisions for field production, growers are also focused on maintaining the health of their starts in greenhouses. Some have purchased their own water baths for seed treatment, and others have implemented a biocontrol strategy for managing pests in their greenhouses. At one plant nursery this week we saw barley banker plants for aphid control using *Aphidius* wasp parasitoids AND pollen producing plants (decorative pepper and sweet alyssum) for attracting *Orius* pirate bugs to control thrips and spider mites. Vegetable crops are susceptible to many of the same pests and can benefit from these same strategies.



*Barley banker plants inoculated with bird-cherry oat aphid attract *Aphidius colmani* released to control green peach and melon aphids (left). ‘Black pearl’ hot pepper banker plants are heavy pollen producers which attract *Orius laevigatus* predators released to control thrips and spider mites (right)*

## MANAGING APHIDS IN EARLY-SEASON TUNNELS

As some of you may already have noticed, aphids can survive in tunnels where crops were produced throughout the winter, and their populations can really start to increase at this time of year. Young seedlings and early-season tunnel crops being planted now are very susceptible to damage from aphid feeding, and must be protected. Scout now to catch problems before the population skyrockets, and consider using biocontrol organisms to maintain aphid colonies at non-damaging levels.

Correctly identifying the species of aphid affecting your crop is an important first step before selecting which biocontrol organisms will be effective:

**Green peach aphid:** This aphid species can be distinguished from the melon/cotton aphid by the length and color of the cornicles (the pair of tube-like protrusions extending from the end of the abdomen). Green peach aphids have long (approximately the length of the body) cornicles and only the tips are black. In addition, the head has a distinct indentation at the base of the antennae. Hosts include peach, apricot, and over 200 species of herbaceous plants including vegetables and ornamentals.



*Green peach aphid winged and wingless forms. Photo: D. Ferro*



*Melon aphids. Notice range in coloration, size, winged and wingless forms. Photo: Martin Spellman*

**Melon/cotton aphid:** The cornicles on melon/cotton aphid are short (approximately 1/3" or 8.0 mm, the width of the body) and vary in color from light yellow to very dark green (making them appear black). The antennae are typically shorter than the body. Melon/cotton aphids do not have a distinct indentation at the base of the antennae like that of the green peach aphid. Its host range includes hundreds of species such as pepper, eggplant, spinach, asparagus, okra, and it is particularly damaging on cucurbits.

**Foxglove aphid:** Foxglove aphids have green flecks located at the base of their cornicles. In addition, they have black markings on their leg joints and antennae. Foxglove aphids tend to fall off plants when disturbed and they can cause severe leaf distortion, more so than the green peach and melon/cotton aphid. This aphid has many hosts including foxglove, lettuce, potato, clover and bulbs.

**Potato aphid:** may be difficult to identify because their sexual forms produce both green and pink aphids, however they move more quickly than the other aphids. These aphids complete 2-6 generations on their winter host of rose plants before moving on to their summer hosts such as potato and tomato. Therefore, this aphid pest is not typically seen in tunnels until later in the season but they have been reported as a growing problem among high tunnel tomato growers and keeping an eye out for them early is a good idea.



*Potato aphids. Photo: Joseph Berger*

**Cabbage aphid:** Not typically considered a tunnel pest, this species has been reported recently in several tunnels where brassicas have been overwintered. Mature females are greyish green with dark heads and cornicles. They are approximately 1/12 inch long. Hosts are only the brassica species.

**Root aphid:** The primary root aphid (*Pemphigus* species) overwinters as eggs and infests plants in the spring and fall. Root aphids may be misidentified as mealybugs because they are covered with white wax although they are smaller than mealybugs. Root aphids have reduced cornicles that resemble rings, which are located on the end of the abdomen. These cornicles can be seen when magnified.

**Biological Control Using Parasitoids.** In general, parasitoids are more effective than predators (such as ladybeetles, green lacewings, and predatory midges) in reducing aphid populations, although parasitoids may fail to provide acceptable control under warm conditions or at times when aphid populations tend to increase rapidly. Parasitoids lay eggs inside aphids and when those eggs hatch, larvae feed on the aphid internally, killing it. Parasitoid larvae pupate within the dead aphid exoskeleton, which becomes a tan, dome-shaped shelter known as a "mummy." Adult parasitoids emerge from aphid mummies and continue the cycle. Aphid parasitoids are host-specific in terms of the aphid species they attack. For example, *Aphidius ervi* attacks foxglove and potato aphid, while *Aphidius colemani* attacks both green peach and melon aphids. Currently no parasitoids are commercially available for cabbage and root aphids. Mixtures of different parasitoid species are commercially available and should be used when multiple aphid species are present. Parasitoids are shipped either as adults or 'aphid mummies' from which parasitoid adults soon emerge. To increase the parasitoids' effectiveness, place small groups of the aphid mummies in cups near aphid colonies. Do not let these aphid mummies get wet. Release rates may vary depending on the parasitoid species. Containers often contain approximately 250 aphid mummies, which can treat 5,000 ft<sup>2</sup> at the high release rate (for high aphid populations) or 25,000 ft<sup>2</sup> at the low release rate (for less severe outbreaks).



*Brown shell of mummified aphid with exit hole. Photo: A. Cavanagh*

Greenhouse temperatures should be 65-77°F (18-25°C), with 70-85% relative humidity. Aphid parasitoids must be applied preventively to suppress aphid populations. They are less effective

when aphid populations are high and already causing plant damage. Release parasitoids on a regular basis to sustain their populations during the growing season. Avoid releasing parasitoids near sticky cards to prevent capturing the released parasitoids. When scouting, look for aphid mummies that have circular holes on one end. These are the exit holes created by adult parasitoids during emergence. Aphid parasitoids are sensitive to pest control materials. Release parasitoids preventively on crops you know are susceptible to aphids, so that the parasitoids will be present when aphids are first noticed.

**Banker Plant Systems.** One of the challenges associated with trying to build up parasitoid populations before the pest aphids emerge are that they may leave the tunnel in search of food, however, there is a way to keep the parasitoid in your tunnels by giving them an alternate food source. Banker plant systems may be useful in controlling aphids and reducing the costs associated with applying pest control materials. Aphid banker plants are containers with winter barley, common rye or oats on which colonies of grass-feeding aphid species such as bird-cherry oat aphid (*Rhopalosiphum padi*) are established. Banker plants are primarily used to rear prey or hosts, in order to have a sufficient population of continually reproducing natural enemies. The bird-cherry oat aphid, however, is too small for the parasitoid, *A. ervi*, to develop. *A. ervi* parasitizes larger aphids such as the foxglove or potato aphid. If foxglove or potato aphids are your predominant species, one option is to use the predatory midge, *Aphidoletes aphidimyza* for release onto your banker plants. If using predatory midges, placing the pots in trays with moist sand will help provide pupation sites for the predatory midges, which pupate in soil.

Banker plants need to be placed along walkways and at the end of benches. It is essential to evenly distribute them throughout a greenhouse. Some growers will place the banker plants in hanging baskets with drip irrigation to ensure that the banker plants will remain irrigated without inadvertently washing the parasitized aphids off of the plant. Distribute containers of rye or barley, with the grass-feeding aphid, among the main crop at a rate of one banker plant per 1,000 ft<sup>2</sup> even before aphids are detected. It should be noted that existing recommended rates may vary since limited research has been conducted; start with this rate and adjust in succeeding years based on your experience. Research with aphid banker plants in greenhouse pepper production in the Netherlands showed that when 4 banker plants per acre were introduced every two weeks, aphid pests were kept below threshold. With this rate and frequency of introduction of banker plants, the average number of *Aphidius* caught per sticky card (3.9" by 9.75") per week was 10 per card per week. Banker plants may have to be placed closer together or placed in greater frequency within a given area in order to allow parasitoids such as *Aphidius colemani* to find prey on plants, since research has found that this parasitoid migrates just 3.2 - 6.5 feet from the point of release. Occasionally, the banker plant aphids may be found on your main crop; this should not cause alarm, as they only feed on grasses, and it may be a sign that the pot of barley oats or rye has been fed on too heavily and needs to be replaced. It is helpful to start fresh pots of banker grass every 2 weeks to keep the aphids well fed.

Starter aphid banker plants are available from several biological control suppliers including BioBest and IPM Labs. One starter kit is enough to get your banker plant system started for the season, as long as you're growing your own pots of oat, rye or barley.

#### **Tips for using Banker Plants:**

- Place orders for banker plants up to 6 weeks before aphids are expected in your greenhouse.
- Transplant the plugs or seed directly into larger-sized pots (10 inch) so that the grass plants have plenty of room to grow.
- Wait one or two weeks for grass feeding aphid populations to grow.
- Lightly release the "aphid mummies" or *Aphidius colemani* adults onto the starter banker plants. For example, 100 hundred *Aphidius* per banker plant before it is divided and repotted. *Aphidius colemani* attacks the grass-feeding aphid, which is not an aphid pest of most greenhouse-grown crops except monocots such as ornamental grasses.
- Check banker plants weekly and look for newly parasitized aphids ("aphid mummies"), which indicate that the parasitoids are establishing on the banker plants.
- Start new banker plants every 2 weeks because they will decline from aphid feeding within a few weeks.
- Inoculate new banker plants by physically transferring aphids from old banker plants onto new ones every 2 weeks. This can easily be done by gently rubbing the aphid infested grass plants over the fresh banker plants.
- It may be necessary to "protect" or isolate your replacement banker plants from natural enemies (either established in your greenhouse or naturally occurring natural enemies that may enter the greenhouse from outdoors during warmer

weather). If so, place banker plants in “starter cages” so you can build up your population of grass feeding aphids before releasing *A. colemani*.

For more detailed instructions please read [this factsheet](#) from UVM and BioBest.

**Entomopathogenic fungus:** The entomopathogenic fungus, *Beauveria bassiana*, is commercially available for use against aphids. However, because aphids have high reproductive rates and molt rapidly, especially during the summer, repeat applications are typically required. *Beauveria bassiana* is most effective when aphid populations are low. This fungus may not be compatible with the convergent ladybird beetle (*Hippodamia convergens*) depending on the concentration of spores applied.

*Compiled by Susan Scheufele, UMass Extension* From the following resources:

[Aphids on Greenhouse Crops](#), by Tina Smith, UMass Extension, [Managing Aphids in the Greenhouse](#), by Leanne Pundt, UConn Extension, [Aphid Banker Plants](#), by Leanne Pundt, UConn Extension **Other helpful resources:** [Aphid Banker Plant System for Greenhouse IPM: Step-by-Step](#), by Margaret Skinner & Cheryl Frank, UVM Entomology Research Lab and Ronald Valentin, BioBest, [Scheduling Biologicals](#), by Linda Taranto, D&D Farms and Tina Smith, UMass Extension

## **UNDERSTANDING THE NUTRIENT MANAGEMENT REGULATIONS**

On December 5th, 2015 [Plant Nutrient Regulations \(330 CMR 31.00\)](#) went into effect in the state of Massachusetts establishing limitations on when and where plant nutrients may be applied to agricultural lands. Cape Cod and the Islands developed their own sets of regulations by municipality, and those may be found here: <https://ag.umass.edu/agriculture-resources/nutrient-management>

The purpose of this regulation is to protect our water resources from nutrient pollution while maintaining agricultural productivity. These same goals are echoed by many farmers in their nutrient management practices and the steps required to comply with these regulations will not seem burdensome to those who already have good nutrient management and record keeping practices in place. If you have not kept records of nutrient applications in the past, now is a good opportunity to start since these records will also help you make the most economical nutrient applications by comparing yield response to applications over time.

The Massachusetts Department of Agricultural Resources (MDAR) is responsible for enforcing these regulations and regulators have stated at public meetings that their efforts currently are focused on education, not enforcement. Also, since Governor Baker instituted an Executive Order for Regulatory Review, all state regulations including this one are open for review therefore some changes may still occur.

**A Nutrient Management Plan** will need to be prepared for any farm making nutrient applications to 10 acres or more (the acreage does not need to be contiguous). If preparing a plan yourself, use the checklist following this article. Use links to websites from the checklist as options for preparing each portion. The mapping software available online is particularly helpful. Plans are the responsibility of the land manager, though they may be developed by a crop consultant. Farms with an NRCS 590 Conservation Plan are in compliance with this portion of the regulation. Plans are to be kept on-farm in case of an inspection by MDAR.

**Setbacks from water resources, limitations on Fall and Winter applications, rules on field stacking of byproducts (section 31.03 of the regulations), and record keeping** are responsibilities of all farms regardless of size. While the Nutrient Management Plan is the responsibility of the farm manager, records are the responsibility of the applicator.

Many of the requirements in this regulation are that farmers follow UMass Guidelines for Nutrient Management and testing. UMass Guidelines recommend use of the Modified Morgan extraction method for soil testing because this method has over 50 years of calibration and correlation data showing crop response to nutrient applications in the field. Labs with the Modified Morgan extraction method include: [UMass](#), [UMaine](#), [UVM](#), [UConn](#), [Dairy One \(Cornell\)](#) and [Spectrum Analytic](#). General UMass Guidelines for Nutrient Management in Vegetable Production may be found here: <https://ag.umass.edu/vegetable/resources-services/nutrient-management>

When UMass does not offer any guidelines because local research is not available or we do not have the expertise, farmers

should refer back to the regulations for guidance or contact one of the people below with any questions.

If you have any questions about UMass Guidelines for Nutrient Management, contact Katie Campbell-Nelson, UMass Extension Vegetable Program: 414-545-1051 or [kcampbel@umass.edu](mailto:kcampbel@umass.edu)

If you have any questions about the Plant Nutrient Regulations, contact Hotze Wijnja, MDAR Chemist, Crop & Pest Services: 617-626-1771 [Hotze.Wijnja@state.ma.us](mailto:Hotze.Wijnja@state.ma.us)

### Nutrient Management Plan Checklist:

- Operator name and address
- Location of all land under Plan (addresses or GPS coordinates)
- Date the Plan was prepared or updated
- Period of time the Plan covers (may be up to 3 years unless there is a change in management practice)
- Name and contact information of the person responsible for the Plan development
- Map or aerial photograph, which shall include: field boundaries, field names, field acreage, location of surface waters and public supply wells, and setbacks if present.
- Google Maps area calculator allows you to calculate field acreage easily: <https://www.daftlogic.com/projects-google-maps-area-calculator-tool.htm>
- OLIVER: Mass GIS online mapping tool allows you to find and mark public water supplies, and Zone I's on your land: [http://maps.massgis.state.ma.us/map\\_ol/oliver.php](http://maps.massgis.state.ma.us/map_ol/oliver.php)
- Web Soil Survey allows you to map soil types on your land: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>
  - Current and/or planned crop and crop rotation for each field or management unit
  - Determination of nutrient needs for crop production based on test results, nutrient credits from preceding crops, UMass guidelines.
- Most recommendations for vegetable crops are available in the New England Vegetable Management Guide: <https://nevegetable.org/> It is not necessary to copy crop nutrient needs from this publication into your plan as long as a web link or hard copy of the book is being used.
  - Determination of whether a Nutrient Application Rate should be based on nitrogen or phosphorus as a limiting factor.
- High, above optimum or excessive phosphorus soils: Recommendations for fields with soils containing a high or excessive phosphorus level shall follow UMass Guidelines for high-phosphorus soils. Recommendations for nutrient application rates on high-phosphorus soils may be refined by conducting a risk assessment of phosphorus loss to surface waters, including the use of the Massachusetts NRCS Phosphorus Runoff Index or UMass recommended risk assessment procedures for high-phosphorus soils.
  - Inventory of agricultural byproducts and nutrient sources
  - Timing and amount and method of application for each field

### Record Keeping Checklist:

- Soil test results and recommended nutrient application rates
- Quantities, analyses, and sources of plant nutrients applied
- Dates and methods of nutrient application
- Crops planted



*Labs that offer Modified Morgan extraction*

--By Katie Campbell-Nelson, UMass Extension

## **NEW ENGLAND VEGETABLE MANAGEMENT GUIDE – CORRECTIONS & PRODUCT REGISTRATION UPDATES**

The 2016-2017 print edition of the New England Vegetable Management Guide contains an error. On page 133, in the Cabbage, Broccoli, Cauliflower and Other Brassica Crops section, cyantraniliprole (Verimark) is listed under Cutworm. It should instead be listed in the previous column, under Cabbage Maggot. Verimark is not labeled for use against cutworm, but is one of the few materials available for control of cabbage root maggot in leafy brassicas. For cabbage maggot, apply 10-13.5 fl oz/A to soil at planting (3dh, REI 4h). Additionally, the label for Coragen (chlorantraniliprole) has been amended to include cabbage root maggot as a target pest, for suppression only and only when applied in transplant water. Apply Coragen at 3.5-7.5 fl oz/A (3dh, REI 4h). The [on-line version of the Vegetable Guide](#) has been updated to reflect these edits.

### **EPA proposal to revoke chlorpyrifos food tolerances**

The above corrections are particularly important given [EPA's proposal to revoke all food tolerances](#) for chlorpyrifos (Lorsban), which would effectively disallow its use. This material is commonly used for control of cabbage root maggot. In response to a US 9th Circuit Court of Appeals ruling, the EPA issued the proposed revocation and accepted public comment - this comment period ended on January 5, 2016. EPA is required by 9th Circuit Court ruling to issue a final rule by December 30, 2016. The proposed revocation is in response to a petition stating concerns about the combined effects of chlorpyrifos residues on food with low-level environmental exposures, particularly among populations living near agricultural areas where they may be affected by drift and/or exposure through drinking water.

### **Additional EPA registration cancellation notices**

On November 12, 2015, the EPA issued a final cancellation order for all materials containing the active ingredient, **sulfoxaflor** (Closer SC, Transform WG). Distribution or sale is now prohibited, but existing stocks held by end-users may be used according to the label. Shortly after the EPA approved registration of sulfoxaflor in May 2013, the Pollinator Stewardship Council, and other pollinator advocates and beekeepers petitioned the US 9th Circuit Court to review EPA's registration decision. The Court issued its ruling in September 2015, stating that the EPA needed to obtain further studies and provide more substantial evidence of the material's safety with respect to its effect on bees. [View the final cancellation order here](#).

More recently, the EPA issued a notice of intent to cancel the registrations of products containing **flubendiamide** (Belt SC, Vetica). EPA issued a conditional registration for the material in 2008, contingent upon use and further review of environmental effects. Based on studies that EPA says show that flubendiamide breaks down into substances toxic to benthic invertebrates, EPA requested that Bayer and Nichino voluntarily cancel their product registrations. Bayer has refused the request, asking for a hearing and stating that they have met EPA's conditions for registration. On March 1, 2016 EPA moved to cancel the insecticide. The cancellation will not be effective until a final order is issued by EPA, pending Bayer's requested hearing. For more information, see this [EPA press release](#).

All sulfoxaflor products have been removed from the on-line Vegetable Management Guide, and listings of flubendiamide and chlorpyrifos products will be updated according to the EPA's forthcoming decisions. Please update your print versions accordingly.

-- by Lisa McKeag, UMass Extension, New England Vegetable Management Guide Co-Editor

## **NEWS**

### **FDA RISK ASSESSMENT ON THE USE OF RAW MANURE – PUBLIC COMMENT PERIOD OPEN**

The FSMA Produce Rule was finalized in November 2015. The original proposed rule called for a 9-month interval between applying raw manure and harvest. After receiving feedback from the public that this interval was too long, in the final rule the FDA withdrew this application interval with the stipulation that the FDA would pursue a risk assessment and research agenda in order to establish an appropriate interval with respect to produce safety. For the time being, the FDA recognizes that many growers use the 90/120 interval set forth by the National Organic Program standard, which calls for

a 120-day interval between applying raw manure and harvesting crops that contact the soil, and a 90-day interval for crops that do not contact the soil, and they “do not intend to take exception to the continuation of this practice in the interim period”.

On March 4, 2016 the FDA published a notice requesting public comments and scientific data to support the risk assessment as promised in the final Produce Rule. They are seeking information from both the scientific community and from farmers. Specifically, they are interested in:

1. Data on the prevalence and levels of pathogens.
2. Data and information on survival of pathogens (e.g., *Salmonella*, *E. coli* O157:H7), and pathogen transfer to produce.
3. On-farm manure-use practices, including, but not limited to, the following aspects:
  - a. Extent of manure use
  - b. Types of untreated manure and types of soil, and crops typically grown in manure-amended soils
  - c. Proportion of produce farms that have one or more soil types per geographical location
  - d. Amount of manure applied per unit surface (e.g., per acre) or ratio of manure to soil, for different crops
  - e. Time of year, number of applications, and amount of untreated amendments that are applied
  - f. The method of application (e.g., surface, incorporated), and whether or not the amended soil is covered (e.g., with plastic mulch)
  - g. Produce commodity type and cropping cycles
  - h. Climate conditions and irrigation practices after soil is amended, before and after planting
  - i. Crop density (e.g., the number of rows per bed, and the distance between adjacent rows in a bed), distance between two crop beds (furrow width), and the influence of such factors on pathogen transfer.
4. Harvesting, handling, and storage conditions that may affect pathogen detection and levels, survival, growth, or inactivation between harvest and retail sale along the farm-to-fork continuum.
5. Storage conditions such as times and temperatures that may affect pathogen growth and/or survival during transportation and storage of produce in the consumer’s home, and consumer handling practices with respect to produce after purchase, including data and information on consumer washing practices.

Comments may be submitted until May 3, 2016 at [the Federal Register](#).

## **MDAR SEEKS PUBLIC COMMENT ON THE STATE POLLINATOR PROTECTION PLAN**

The Massachusetts Department of Agricultural Resources (MDAR) is seeking public comment on the state [Pollinator Protection Plan](#). Please note that this document is a draft and will be finalized after a comment review period. Comments can be sent to the following email address: [Kim.Skyrm@state.ma.us](mailto:Kim.Skyrm@state.ma.us) with the subject line “Pollinator Plan Comments”. **The deadline to submit comments is March 31, 2016.**

## **NEW NRCS GAPS PUBLICATION**

Food safety has become a prominent issue for growers of produce, and conservationists who assist them, in planning and installing stewardship practices. In November 2015, the FDA published the Produce Rule, which is one of seven major regulations it will use to enforce the Food Safety Modernization Act (FSMA).

[“Co-Managing Farm Stewardship with Food Safety GAPS and Conservation Practices: A Grower’s and Conservationist’s Handbook”](#) was written by the Wild Farm Alliance, with major support from NRCS.

The document covers how pathogens can get on the farm, the prevalence of pathogens in wildlife and livestock, and environmental factors that influence pathogen reduction. A multi-barrier approach is presented where conservation practices and food safety Good Agricultural Practices (GAPs) can be used to reduce food safety risk.

## **RURAL ENERGY FOR AMERICA PROGRAM - UPCOMING DEADLINE**

REAP provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses to purchase or install renewable energy systems or make energy efficient improvements.

The next REAP deadline for Renewable Energy and Energy Efficiency grants and loan guarantees is **April 30, 2016** for all project sizes. For more information on applying, [click here](#). For more information about REAP, contact Megan ([megan.denardo@cetonline.org](mailto:megan.denardo@cetonline.org), 413-727-3090) to register for the REAP workshop on March 16th!

REAP recently received a grant to help farms prepare their applications, at no cost. But don't wait until the deadline approaches; REAP applications can be submitted any time, so contact them now!

## **EVENTS**

### **Understanding the Nutrient Management Regulations and Worker Protection Standards**

**When:** Wednesday, April 6, 2016 from 10:00am to 1:00pm

**Where:** The Berkshire Athenaeum, 1 Wendell Avenue, Pittsfield, MA 01201

Presented by the Berkshire County Farm Service Agency, Massachusetts Department of Agricultural Resources, and UMass Extension.

‘Understanding the Nutrient Management Regulations’, Hotze Wijnja, MDAR

‘Nutrient Management Plans for Vegetable Farmers’, Katie Campbell-Nelson, UMass Vegetable Program

‘Nutrient Management Plans for Dairy and Livestock Farmers’, Masoud Hashemi, UMass Crop Dairy Livestock Equine Program

‘Worker Protection Standards’, Laurie Rocco, MDAR

For more information contact: Deb Senger, County Executive Director, USDA Farm Service Agency, [debra.senger@ma.usda.gov](mailto:debra.senger@ma.usda.gov), phone: 413-443-1776 ext.105

### **EPA Worker Protection Standard Train-the-Trainer Courses for Organic and Non-Certified Pesticide Users**

**When:** Monday, April 11, 2016 from 8am to 11am

**Where:** Best Western, 181 Boston Post Road West, Route 20, Marlborough, MA 01752

**When:** Wednesday, April 13th, 2016 from 8am to 11am

**Where:** UMass Cranberry Station, 1 Bog Station Rd., East Wareham, MA 02538

**When:** Wednesday, April 27th, 2016 from 8am to 11am

**Where:** Country Club of Pittsfield, 639 South Street, Pittsfield, MA 01201

**When:** Thursday, May 12th, 2016 from 8am to 11am

**Where:** Hadley Farms Meeting House, 41 Russell Rd, Route 9, Hadley, MA 01035

All farmworkers must be trained under the EPA Worker Protection Standard (WPS) if your farm uses any pesticides, including those approved for organic production and other general use pesticides. The agricultural worker employer is responsible for complying with all components of WPS including the training of farmworkers. This training can only be provided by an individual who has a pesticide certification license or has attended an approved EPA WPS Train-the-Trainer workshop.

The train-the-trainer workshops are 3 hours long and will be held in Pittsfield, Hadley, Marlborough and East Wareham. The registration fee is \$28.00 per person. Participants will receive the EPA WPS How to Comply Manual, WPS Pesticide Record Keeping book, EPA WPS Safety Poster, EPA WPS Trainer's Manual, Certificate of Attendance, and the ability to train farmworkers in WPS.

For information on registering for these workshops please refer to our website at [www.umass.edu/pested](http://www.umass.edu/pested)  
Please contact Natalia Clifton, UMass Extension , 413-545-1044 or email [nclifton@umass.edu](mailto:nclifton@umass.edu)  
Sponsored in part by the UMass Extension Risk Management/Crop Insurance Education Program.

### Food Safety for Product Development at Commonwealth Kitchen

**When:** Wednesday, April 27, 2016 all day

**Where:** Commonwealth Kitchen, 196 Quincy Street, Boston, MA 02121

A 1-day, content-filled course with food safety and product development expert Amanda Kinchla from the University of Massachusetts Food Science Department. Do you want to better understand the food safety principles behind your process? Do you need help with product development for your current or future food product? Propel your business to the next level by delving into product development and food safety.

This 1-day course will cover the following topics:

- Principles of Food Safety
- The Product Development Process Cycle to Creating a New Food Product
- Product Development Process (including business strategy, product testing, product launch)
- HACCP Plan requirements and/or Low-acid & Acidified certification
- Financial/Business Considerations
- Determining formula, process and packaging for a safe food system
- Process Validation requirements
- Label Regulations, product claims, ingredient statements and nutrition facts
- Operational capabilities and Quality Controls

Contact Roz Freeman, 617-522-7900, [roz@commonwealthkitchen.org](mailto:roz@commonwealthkitchen.org)

## THANK YOU TO OUR SPONSORS



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

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