



UMASS
EXTENSION



Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 27, Number 1

January 15, 2015

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CROP CONDITIONS

Not much to report here about crop conditions, except that the growing season is closer than you think, and still going strong for you winter producers. By the next issue of Vegetable Notes, some of you may have onions started from seed, or other starts seeded for high tunnels. Now is a good time to scout your equipment for maintenance that should be done before the main season starts. It's easy to forget come spring what broke last fall when you were deep in harvest and clean-up mode, or what great innovation idea you had when you were out in the field. Order machinery replacement parts now, so you're not scrambling when the ground thaws and it's time to get the plow hooked up. We have seen many of you at educational events this past month including the New England Vegetable and Berry Growers Association Winter meetings and the Northeast Organic Farming Association Winter Conference this past weekend. We love these winter meetings as an opportunity to catch up with growers, and put faces to subscribers we've never met. In case you missed them, these meetings included updated information presented by UMass Extension staff: curing and storage for

winter by Ruth Hazzard, managing pests with lures and bio-controls in greenhouses by Tina Smith, disease management update by Bess Dicklow, 2014 Brassica IPM research and diseases of 2014 by Susan Scheufele, and pesticide safety and use for organic growers by Lisa Mckeag and Natalia Clifton. If you'd like slides or information on any of these presentations, write to us at: umassvegetable@umext.umass.edu. If you value the information you're getting from us through educational programs, or this newsletter, we'll be asking for your donations to continue supporting Vegetable Notes as a valuable resource. Look for a letter in your e-mail inboxes next week!

SEED HEALTH: HOT WATER SEED TREATMENT AND GERMINATION TESTING

Two strategies to help you start the season with healthy, disease-free seed are hot water seed treatment to kill pathogens, followed by a germination test to ensure a good stand. Even when only a small percentage of seeds are infested, disease can spread among transplants in the greenhouse or in the field, causing significant crop loss or increasing the need for sprays. In some cases, whole seed lots may be infested and this can result in severe disease outbreaks, as all seedlings will be affected and young plants may not be able to overcome early, systemic infections (Figure 1). Using disease-free seed is an important first step in management of many diseases, and hot water treatment is an effective tool for small-seeded crops such as tomatoes, peppers, spinach, onions, carrots, and all the brassicas. Hot water seed treatment is a cheap and effective way to penetrate the seed and kill pathogens that might be present, using temperatures not higher than 125°F, so that seed viability is protected. Whether or not you choose to treat your seeds, a simple germination test can be very helpful for determining viability of saved seed, old seed, or your treated seed.

Hot Water Seed Treatment

Not all pathogens can penetrate and survive within the seed but bacterial pathogens are



Fig 1. A germination test of untreated Siberian Kale seed saved from an infested field exhibiting lesions of Alternaria (circled).

commonly seed-borne, and some fungi, oomycetes, and many viruses are also seed-borne. Tomato, pepper and brassicas are good candidates for hot water seed treatment because there are common bacterial diseases of these small seeded crops that can be easily prevented. Even though bacterial pathogens do not survive well in soil once infected crop residues have decayed, they can be difficult to manage once established on a farm. Preventing establishment of these diseases, or their reintroduction year after year, is a critical management tool. Large seeded crops (beans, cucurbits, peas, etc.) cannot be effectively disinfested with hot water treatment because the temperature required to heat the whole seed inside and out would kill the outer seed tissue and the seed will not germinate. Chemically-treated or pelleted seed also cannot be hot water treated. Treating seed saved for more than one year or seed saved from a heavily infested field may inhibit germination entirely. Treat no more seed than you think you will use in the course of a season, as hot water treated seed may not remain viable for as long as untreated seed.

To decide whether to use heat treatment, first determine the likelihood that seed-borne pathogens could be present based on the crop (see Cornell fact sheet '[Managing Pathogens Inside Seed with Hot Water](#)' for reference). Next, ask your seed supplier if the seed was produced in a way to minimize exposure to seed-borne pathogens and if the seed was tested for their presence. Find out if the seed has already been treated with hot water or if it has been primed (pre-soaked to promote earlier and more uniform germination) as treating again could adversely affect the seed.

The temperature of water for treating seed varies from 115 to 125°F, depending on the crop, and the treatment period varies from 10 to 60 minutes. It is important to use the appropriate protocol for each crop to control pathogens without damaging the seed. While hot water seed treatment can be done effectively on a stovetop, it is much better to use a precision water bath and an accurate thermometer.

For details on treatment procedures for each crop and for a list of supplies needed please see the following factsheet published by Cornell and Rutgers Cooperative Extensions:

<http://vegetablemdonline.ppath.cornell.edu/NewsArticles/HotWaterSeedTreatment.html>

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 (see Fig. 2). 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, so now is a good time to do it.

If your greenhouse has a moist chamber, this is a great place to do your germination test, but a warm, dark place will also work. Inside the greenhouse may not be a suitable place, as the seeds will dry out quickly. To conduct the test, prepare two 8" x 8" squares of blotting paper or heavy weight 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 and place on a greenhouse heating pad. Keep the heating pad temperature at 75°F, or see Table 1 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



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

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.

Hot Water Seed Treatment Service through UMass Extension Vegetable program.

If you read this article and would now like to treat your seed but do not have the equipment, contact the UMass Extension Vegetable Program for details on a mail-in service we are now providing to Massachusetts growers: umassvegetable@umext.umass.edu or call: 413-577-3976.

Resources:

- Ashworth, S. Seed to Seed 2nd ed. Seed Savers Exchange, Iowa, 2002.
- Maynard, D.N. and Hochmuth, G.J. Knotts Handbook for Vegetable Growers 5th ed. Wiley, New Jersey, 2007/

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 1. 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.

-by K. Campbell-Nelson updated from material by R. Hazzard and S.Scheufele.

TIPS FOR MANAGING DOWNY MILDEW OF BASIL IN 2015

2014 was the worst year for basil downy mildew that we've experienced in the Northeast since the disease was introduced to the US in 2007. This was, at least in part, due to the fact that infected transplants were distributed nationally through big box stores and planting of infected material was widespread, leading to earlier than usual disease and high levels of inoculum in the environment. We wanted to take a moment during the off-season to offer some recommendations for reducing the impacts of this disease on your farm in 2015.

Disease Spread. Basil downy mildew is caused by the oomycete, *Peronospora belbahrii*. It is an obligate parasite, meaning that it cannot survive outside of a living host. It does not produce overwintering oospores, but survives from year to year on living plants where basil production occurs year round, such as in Florida. From these sites the pathogen spreads via wind-dispersed sporangia that can travel great distances due to their dark pigmentation, which protects them from UV radiation. There is also evidence that the disease can be spread by contaminated seed, though we do not yet understand

how this occurs and how important contaminated seed is as a source of primary inoculum.

Symptoms. Early symptoms can easily be mistaken for a nutritional deficiency. Infected leaves develop diffuse, but vein-delimited yellowing on the top of the leaf and a characteristic fuzzy, dark gray growth on the underside of the leaves, which may be mistaken for soil splashed onto the leaf under-surface, however, close inspection with a hand lens will show the sporangia. More photographs of the signs and symptoms are available at: <http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html>

Management Recommendations for 2015

Purchase seed or transplants from reliable sources

We know that the pathogen may be seed borne, but the mechanisms involved are not well known and testing is difficult. Since *Peronospora belbahrii* requires a living host, it cannot be grown in a lab culture, making it more difficult to test for presence of the pathogen on or in seed. It is possible to test seed for the presence of pathogen DNA, but this test only tells you if sporangia of the pathogen were present, not whether those sporangia are viable and infective, potentially leading to false positives. Seed testing of any pathogen is only a proxy, since you can't test all of your seed, only a small portion of it. Any sample you submit for testing may not be wholly representative of the seed lot, leading to false negatives. Therefore, our recommendation is to buy seed from a trusted source.

Talk to your seed supplier about how the seed was produced, if it has been tested, and also if the variety exhibits any resistance to the pathogen.

Grow your transplants yourself and keep a careful eye on them. Look on the undersides of leaves for sporulation (see Fig. 1). Monitor pathogen spread and watch for early symptoms. Once detected, if the disease is not widespread remove infected plants or seedling trays and begin chemical control, or try to harvest and sell plants immediately, before symptoms worsen. If the symptoms are widespread and severe, destroy the crop immediately to stop spread of the disease to other plantings on your farm or to other farms in your area. Do not buy transplants that were grown in large nurseries in the south where the disease starts earlier. If you do buy transplants, inspect them carefully before purchasing and if you find any signs of disease report it to the store manager or call your local Extension service.

Plan to plant and harvest early

The pathogen tends to arrive in MA around mid-July. Again, last year the disease occurred earlier (June 22) because of the early, widespread distribution of infected plants from nurseries further south. Keep track of where the disease is being found via pest alerts in Veg Notes and via the basil downy mildew monitoring program (Google Docs spreadsheet) that Meg McGrath at Cornell University has put together and maintains, accessible here: <http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html>

Do whatever you can to reduce humidity and leaf wetness

In the greenhouse:

- Heat and vent greenhouses—especially when warm days are followed by cool nights—to reduce relative humidity, prevent dew formation and condensation, and reduce the leaf wetness period
- Use fans to improve air flow in greenhouses
- Water in the morning, or use sub/drip-irrigation rather than overhead

In the field:

- Plant in well-drained sites with good air circulation
- Orient rows parallel to the prevailing winds
- Control weeds



Fig. 1. Basil downy mildew symptoms on the top and bottom of leaf. Photo: R. Wick, UMass

- Increase plant spacing
- Harvest/prune so as to improve airflow through/around plants if practical

Relative susceptibility of basil cultivars

- Field trials conducted in southern New Jersey in 2009 determined that all sweet basil (*Ocimum basilicum*) cultivars such as ‘Genovese,’ ‘Italian large leaf,’ ‘Poppy Joe’ and ‘Nufar’ are very susceptible to downy mildew. The least susceptible basil cultivars included the lemon and spice types such as *O. x citriodorum* and *O. americanum*, cultivars ‘Lemon Std’, ‘Lemon’, ‘Lime’, ‘Spice’, ‘Blue Spice’ and ‘Blue Spice Fil’. There are no cultivars with resistance to basil downy mildew.
- Efforts to breed new basil varieties with resistance to downy mildew are ongoing at Rutgers University, where researchers Rob Pyne and Andy Wyenandt continue to make crosses and evaluate breeding lines in the field. Rob and Andy are excited about some recent breakthroughs they have made and look forward to having stable breeding lines with good resistance and classic, sweet basil flavor within the next few seasons.
- There is at least one new commercially available variety with “intermediate” resistance being sold by Johnny’s Seeds called ‘Eleonora’. The variety is a cross of Thai basil and sweet basil. Thai basil has a higher disease tolerance, while sweet basil has the more generally desirable flavor, though some of that spicier Thai basil flavor does carryover in this cross. ‘Eleonora’ also has flatter leaves and a more open habit which will reduce disease favorability of the environment right around the plant and contribute to disease tolerance.
- Resistant varieties are one important piece of the puzzle, but will need to be used as part of an integrated management plan incorporating cultural practices and chemical controls to effectively manage this disease.

Chemical control

- Pay close attention to labels. Basil is a minor crop and is not always found on pesticide labels, and there are differences in registrations for use in field versus greenhouse production.
- Research trials have shown that the phosphite fungicides (eg. K-Phite, Prophyt, Fungi-phite) are among the most effective chemical controls. Other effective materials include mandipropamid (eg. Revus), cyazofamid (eg. Ranman), and fluopicolide (eg. Presidio). Azoxystrobin (eg. Quadris). These can be used in the field but not in the greenhouse.
- OMRI-approved products labeled for basil downy mildew include MilStop, OxiDate, Actinovate, Regalia, Trilogy and Double Nickel LC. There is not strong efficacy data for these materials and they should be used as part of an integrated plan. Be sure to make applications preventatively (scout under leaves, follow pest alerts) and keep up regular sprays.
- This year the UMass Extension Vegetable team evaluated 4 different copper products alone and in rotation with Regalia and saw no differences from the untreated control for any of the products. Copper products may be more effective in a year in which disease pressure is not so high, and if the first spray is made as soon as the plants are moved outdoors. We hope to repeat this study in 2015. ***Please note that no coppers are currently labeled—the purpose of these experiments was to demonstrate efficacy and get some of these more effective materials labeled for the crop and the disease.
- It is the grower’s responsibility to read and follow label instructions and be sure that a product is registered for use in the greenhouse. The label is the law and any recommendations made here are superseded by the label.



A 2014 Vegetable Program trial showed that Ranman significantly reduced severity and slowed spread of disease, but still did not lead to marketable yields. Photo: S. Scheufele, UMass

–Susan B. Scheufele, Robert L. Wick and M. Bess Dicklow, UMass Extension; thanks to Rob Pyne and Andy Wyenandt at Rutgers University, and Margaret T. McGrath, Cornell University.

AVIPEL: HELP US DOCUMENT A SPECIAL LOCAL NEED FOR CONTROL OF BIRD DAMAGE TO SWEET CORN SEEDLINGS

Bird damage to sweet corn can affect more than just ripening corn ears on the stalk—birds can also cause damage much earlier on, at seeding. Many bird species actually feed on corn seed itself, and can pull up whole fields causing significant crop loss, hours or weeks after seeding. Growers often go back and try to reseed areas where damage and loss are high, but this takes time and energy and seed, and often the birds just keep coming back. This kind of seedling loss seems to be worse around field edges, as birds move in from sheltered areas.

There are commercial bird repellents available in MA that are designed to protect ripening ears, made from grape extract that has an undesirable flavor to birds, but none are labeled for use as a seed treatment. Currently, Avipel (Arkion Life Sciences) is the only seed treatment on the market and has a special local needs label in neighboring states of NH, ME, and VT but is NOT labeled in MA. UMass Extension and USDA Fish and Wildlife are seeking the same type of label (24c) to get this product registered for use in MA and in order to do so we need documentation from farmers as to the type and extent of damage. If you have experienced this type of bird damage on your farm please complete the following 4 question survey and help us get a new product labeled for MA sweet corn producers. Your time is much appreciated!

<https://www.surveymonkey.com/s/YNMP3XY>

—Susan B. Scheufele and Rich Bonanno, UMass Extension Vegetable Program

MASS ROLLOVER PROTECTIVE STRUCTURE (ROPS) REBATE PROGRAM IS UP AND RUNNING

The Massachusetts Department of Agricultural Resources (MDAR), with the help of the New York Center for Agricultural Medicine & Health, is pleased to introduce a Tractor Rollbar Rebate Program for Massachusetts. The [MA Rollover Protective Structure Program \(ROPS\)](#) is a PILOT Program designed to assist farmers in installing rollbars by offering a rebate of 70% of costs up to \$865. This pilot program has limited funds, but MDAR hopes to assist in retrofitting 28 to 35 tractors with rollbars in 2015. Participants in the ROPS program will be chosen on a first come first served basis.

All participants must apply [on-line](#) or by calling the ROPS Hotline (1-877-ROPS-R4U or 1-877-767-7748). ROPS Hotline staff will provide estimated costs as well as sources for purchasing certified ROPS. Prior to ordering, participants must call for pre-approval. [Flyer and complete details here](#)

Contact Barbara Bayes - ROPS Hotline (1-877-ROPS-R4U or 1-877-767-7748), bbayes@nycamh.com, or Bob Rondeau, MDAR, 617-626-1804, robert.rondeau@state.ma.us.

2014 FARM BILL RISK MANAGEMENT PROGRAM CHANGES THAT MAY AFFECT YOU

The 2014 Farm Bill made several important changes that may affect your 2015 risk management plans. This farm bill expanded options available to Massachusetts farmers to cover their production and market risk.

- Federal Crop Insurance: The 2014 farm bill created a [Whole Farm Revenue Protection \(WFRP\)](#) to replace the Adjusted Gross Revenue policies. Whole Farm Revenue Protection (WFRP) provides a risk management safety net for all commodities on the farm under one insurance policy. This insurance plan is tailored for any farm with up to \$8.5 million in insured revenue, including farms with specialty or organic commodities (both crops and livestock), or those marketing to local, regional, farm-identity preserved, specialty, or direct markets. WFRP will allow growers to insure their revenue from income losses related to natural disasters and/or market fluctuations. Beginning farmers will receive 10 percentage points of additional subsidy to reduce their premiums (Policy fees are also waived). The Risk Management Agency (RMA) considers individuals with less than 5 years of experience as beginning farmers.
- [Non-insured Crop Disaster Assistance Program \(NAP\)](#) sold by the USDA Farm Service Agency (FSA) now has buy-up provisions as follows: In addition to the service fee, producers who elect buy-up coverage must pay a premium equal to the lesser of: 5.25% of the guarantee or 5.25% of the payment limit. FSA will waive NAP service fees and reduce buy-up premiums by 50% for beginning farmers (BF), limited resource farmers (LR), and historically under-

served farmers, which includes women. The net results are that farmers can enroll at the minimum coverage level for free and if they choose buy-up coverage it cost them less than 3 cents for each dollar of protection. Payment limitation has been increased from \$100,000 to \$125,000. The sales closing date for 2015 aquaculture and perennial crops has passed, however FSA will give producers a 60 day window to purchase buy up coverage after the final rules are published in the federal register. The sales closing date for annual crops is March 15, 2015.

Crop insurance and NAP can provide meaningful protection for almost any crops that farmers grow. They will provide financial assurance to your business plan when disasters occur. Contact your FSA office or a crop insurance agent before the enrollment deadlines. UMass Extension works in partnership with the USDA Risk Management Agency (RMA) to educate Massachusetts producers about Federal Crop Insurance and Risk Management Programs. For more information, please visit www.rma.usda.gov or contact UMass Risk Management Specialists Paul Russell at pmrrussell@umext.umass.edu or Tom Smiarowski at tsmiarowski@umext.umass.edu.

UPCOMING EVENTS

[Post-harvest Handling of Vegetable Crops](#)

When: Tuesday, January 20, 2015 from 9:00 am to 4:00 pm

Where: Lake Morey Inn and Resort, 1 Clubhouse Road, Fairlee, VT 05045

The Vermont Vegetable and Berry Growers Association is hosting a special topics conference on post-harvest handling and storage. This all-day program will be packed with presentations by farmers and Extension personnel on topics including: Harvest systems, washing stations, wash water sanitizing and recycling, vegetable crop curing and storage, rodent control, and storage diseases. Each 20 minute presentation will be followed by discussion.

Registration is \$40 per VVBGA member, \$50 per non-member, until January 17. Add \$10 for at-the-door registration. To register on-line go to: <http://2015vvbga.eventbrite.com>.

[Harmonized Good Agricultural Practices \(GAP\) Training Program](#)

When: Tuesday, January 27, 2015 from 10:00am to 4:00pm

Where: Massachusetts Farm Bureau Federation Office, 249 Lakeside Dr, Marlboro, MA 01752

UMass Extension Educator, A. Richard Bonanno, Ph.D. will present on:

- the costs and impact of diseases and outbreaks caused by food-borne pathogens
- strategies for controlling potential microbial food safety hazards before planting and throughout all phases of production - planting, production, harvesting and postharvest handling
- changes to the USDA GAP Program to reflect the Harmonized Audit
- the Third Party Audit process
- the MA Commonwealth Quality Program
- The status of FDA draft regulations to implement the Food Modernization Act of 2010

You will also:

- receive a manual filled with GAP resources
- receive a memory stick loaded with the GAP Manual and templates needed to maintain records to verify USDA GAP that can be customized for your farm

At the end of the session, you will receive a certificate of participation through UMass Extension.

Registration cost is \$50.00 for the first person, and additional employees are \$10.00. Additional employees' cost includes the presentation and lunch, but not the GAP manual or memory stick. Space is limited. Registration deadline: Tuesday, January 20. [Click here for registration information.](#)

[New England Cooperative Extension and NEV&BGA Winter Program](#)

When: Saturday, January 31, 2015, from 9:30 am to 3:15 pm

Where: Hudson Lodge of Elks, 99 Park St, Hudson, MA 01749

Join the New England Vegetable & Berry Growers Association (NEV&BGA) and NE Extension for an all-day educational program, and the 589th meeting of the NEV&BGA. Topics will include:

- Managing brown marmorated stink bug
- Managing spotted wing drosophila
- Putting together a farm food safety plan for GAP and Commonwealth Quality
- What's new in weed management

** 2 pesticide recertification credits will be offered. There is a \$20.00 Registration Fee. This fee is waived for members of NEV&BGA.



Become a member! The New England Vegetable and Berry Growers Association is the oldest growers association in the United States. This strong and progressive organization is an active advocate for farmers at every scale, and works closely with Cooperative Extension to organize and co-sponsor educational programs including daylong meetings and the biennial New England Vegetable and Fruit Conference and Tradeshow in Manchester, NH. The Association supports Extension research projects with funding from members. Membership in the NEV&BGA connects you to a network of hundreds of experienced growers around New England, and includes free registration at one-day educational programs. [Join NEV&BGA today!](#)

[New England Agricultural Marketing Conference & Trade Show](#)

When: Wednesday, February 25 and Thursday, Feb 26, 2015

Where: Sturbridge Host Hotel, 366 Main St, Sturbridge, MA 01566

This is the 5th biennial New England conference and it draws hundreds of farmers and farm industry members to idea-laden workshops and to hear motivational speakers. The theme of the 2015 conference is Direct Marketing to Diversified Wholesale, Finding What Works. Attendees will experience nearly 30 workshops on topics such as retail and wholesale marketing, agri-tourism, business planning and more. An all day workshop for New England Farmers' Market Managers will be held on Wednesday, February 25th. Don't forget the trade show with a large variety of agricultural suppliers and vendors!

***Early Bird registration until February 3. Click [here](#) or go to www.harvestnewengland.org for more information. Program details and lodging options are also available at this site. Register early for the best rate!

[Plant Nutrition and Organic Certification for Greenhouse Crops](#)

When: Thursday, February 26, 2015 from 10:00 am to 1:30 pm

Where: D&D Farms Inc., 32 Hudson Rd., Stow, MA 01775

Presented by UMass Extension, this half-day program will cover:

- Fertilizing Container Grown Crops with Water Soluble Fertilizers
Dr. Rosa Raudales, University of Connecticut
- Growing Spring Crops Using Organic Fertilizers
Dr. Douglas Cox, UMass Extension
- Organic Certification for Greenhouse Container Crops
Don Persons, Certification Administrator, Baystate Organic Certifier

Mail-in Registration: [Printable Program and Registration Form](#), Cost: \$30 (Includes Lunch)

For more information contact:

Tina Smith, Univ. of Mass, Amherst 413-545-5306, tsmith@umext.umass.edu

Geoffrey Njue, Univ. of Mass, Cranberry Exp. Station 508-295-2212 ext. 47, gnjue@umext.umass.edu

Bob Luczai, Massachusetts Flower Growers Association, bluczai@massflowergrowers.com

[UMass Extension Symposium: Pollinator Health for Agriculture and Landscapes](#)

When: Thursday, March 26, 2015 from 8:45 am to 4:00 pm

Where: Campus Center Auditorium, 1 Campus Center Way, Amherst, MA 01003

UMass will host experts from New England Extensions to cover the following important topics in pollinator health:

- Biology, Diversity and Conservation of Native Bees in the Northeast
Joan Milam, Department of Environmental Conservation, University of Massachusetts-Amherst
- The Natural History and Ecology of Honey bees in Our Landscapes
Dr. Frank Drummond, School of Biology and Ecology, University of Maine
- How Healthy are the Bees?
Dr. Frank Drummond, School of Biology and Ecology, University of Maine
- Designing Pollinator Support Plantings: Think Like a Bee
Dr. Lois Berg Stack, University of Maine, Northern New England Pollinator Habitat Working Group
- Neonicotinoids in Agriculture and Landscapes: Do They Harm Honey Bees or Native Bees?
Dr. Kim Stoner, The Connecticut Agricultural Experiment Station
- Creating a Bee-friendly Landscape: Protecting Bees from Pesticide Exposure
Dr. Anne Averill, Department of Environmental Conservation, University of Massachusetts

**4 Pesticide Credits have been approved in all categories.

For more information about the program contact:

Tina Smith, Univ. of Mass, Amherst 413-545-5306, tsmith@umext.umass.edu or
Ellen Weeks, Univ. of Mass, Amherst, 413-545-2685, eweeks@umext.umass.edu

Cost: \$65 for one, if two or more from same business, then \$40/person

Mail-in Registration: [Printable Program and Registration Form](#) or [Register On-Line](#) using a credit card.

Vegetable Notes. Ruth Hazzard, Katie Campbell-Nelson, Lisa McKeag, Susan Scheufele, co-editors. Vegetable Notes is published weekly from May to September and monthly during the off-season, and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.