



UMASS
EXTENSION



Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 25, Number 20

September 12, 2013

IN THIS ISSUE:

Crop Conditions

[Late Blight Survey](#)

[Pest Alerts](#)

Sweet Potato Harvest & Storage

Identifying Diseases of Carrots

Explore Your Roots

Preparing your Pesticide Shed for Winter

Upcoming Events

CROP CONDITIONS

Growers are focused on bringing in butternut, other winter squash and pumpkinS, looking for good conditions to windrow, bin and store the crop. In western parts of the state intermittent heavy rains have made this task more difficult, but eastern and central MA have been dry since the first days of September. Farm crews often shrink at this time of the year, which puts an extra load on the remaining crew that is bringing in these bulky fall harvests. Squash yields and maturity are variable, based on when they were planted and how weather conditions affected early growth, fruit set, and disease. The good news is that market demand for squash is strong. After a series of August

and early September downpours, *Phytophthora capsici* exploded in some fields causing partial or total loss of crops including in beans, squash and peppers. Production of tomatoes, peppers and eggplant is variable – some growers report that these are winding down (afflicted by disease, drought, or simply ‘past their prime’) while others are still pulling in good harvests. Late ripening was widespread in these crops. Seeding and transplanting of hardy greens continues for growers who expect to use high and low tunnels and row covers to extend growth into November and December, or through the winter. Greens planted in August are growing well. Fall Brassicas are generally doing well, but growers are contending with many issues including dry soils, long dew periods, the emergence of the 2nd generation of flea beetles, continued caterpillar pressure, and the threats posed by Alternaria, black rot, soft rot, and other diseases. Onion harvest is mostly finished, and potatoes are being harvested for immediate sale. Growers are leaving storage potatoes in the ground until colder weather arrives.



A hefty butternut squash harvest at a farm in Hadley, MA.

SURVEY ON LATE BLIGHT INCIDENCE & MANAGEMENT

Late blight of tomato and potato has become a more serious and common problem over the past few years. Researchers and extension agents at UMass have been working to document late blight outbreaks, better understand the pathogen biology, and facilitate best management practices to reduce impacts of late blight epidemics. The short survey below aims to find out how your farm has been affected and how you have managed this disease, as well as how the UMass Extension Vegetable Program can better serve the needs of those impacted by late blight. Please respond with the 2012 and 2013 growing seasons in mind. Thank you for taking the time to fill out the survey, which can be found here: <https://www.surveymonkey.com/s/SVLG5BW>

PEST ALERTS

[Squash vine borer](#) moth captures (2nd generation flight) are reported to be dropping to zero in NH. However, borers from 2nd flight are likely feeding now, and can attack pumpkin fruit as well as vines.

[Voles](#) pose a threat to beet, Brussels sprouts, cabbage, carrot, cauliflower, celery, lettuce, spinach, sweet potato, tomato, and turnip, in the field and in high tunnels. They are active day and night, year-round. Voles prefer areas with dense vegetation where they dig short, shallow burrows and make underground nests. Watch for signs of activity such as droppings, pathways in the grass, tunnels, and crop damage.

Winter squash and pumpkin harvest: insect, disease, cold, and wet conditions threaten crops in the field. Get your crew out to harvest as soon as crops are mature, and whenever Nature offers a good window. If you have to bring in bins of wet squash, crank up the fans and open the vents to be sure it dries well. Take preventative measures to avoid rodent damage.

Winter rye scavenges leftover nitrogen from summer crops, but this ability declines with later seeding dates. Don't delay in getting fields seeded. We've seen excellent crops of oat and sorghum-sudangrass — bright green from dining on leftover fertility.

Flea beetle damage seems to be on the rise again, after a lull in late August and early September. This is likely the emergence of the adult offspring of beetles that were active in July and early August. Feeding may be intense for a while, but will likely drop off as beetles depart for safe winter quarters, underneath leaves and grass in field edges.

Sweet corn harvest is not over yet for those who make this crop a feature of their farmstand or wholesale operation. Corn earworm flight across eastern MA and southern NH ranged from 2-6 moths per week, calling for a 5 or 6 day spray schedule. Trap data from other areas is not available except for a capture of 0 moths at one location in the CT River Valley. Watch for fall armyworm in the latest blocks; this pest showed up late this year but did some damage in SE MA in late-whorl stage corn.

Fall wheat, a crop of growing interest among vegetable growers, should be planted within the next week or two for good fall establishment. Universities of [Vermont](#) and [Maine](#) offer good resources on wheat production. Look for seed that is free of disease, as this can carry over to next year's crop.

[Late blight](#) was confirmed on potato foliage in Franklin and Worcester Counties, MA this week. Any remaining potato foliage should be scouted immediately. Uninfected foliage should be sprayed to prevent disease onset (for treatment

options see the [New England Vegetable Management Guide](#)), or foliage should be killed, mowed, or tubers harvested immediately. Please report any suspicious potato foliage or tubers to your local extension office; the pathogen can overwinter on infected potato tubers so tracking these potential inoculum sources will contribute to understanding and preparing for late blight management next year.

On tomato the disease continues to spread across New England. Conditions remain extremely conducive in Western parts of the state while disease spread has been slower in the east due to drier conditions there (see Table 1). Track disease progress at [USA BLIGHT](#). Growers who have been keeping

Table 1. GDD and BLITECAST output for Late Blight Management

DATE: 9/12/2013	GDD Base 50F	Accumulated LB Severity Values - 7 days	Accumulated Rainfall - 7 days (in)	Recommended Spray Interval (days)
Pittsfield	1937.4	12	0.29	5
Ashfield	2101.5	2	0.61	4
Belchertown	2458.9	4	0.30	7
Deerfield	2441.7	5	0.60	4
Harvard	2432.3	4	0.07	8
Dracut	2456.6	5	0.03	12
Boston	2505.4	1	0.10	8
East Bridgewater	2461.4	8	0.00	12
Seekonk	2587.0	5	0.02	12

up regular spray programs and/or planted resistant varieties report continuing harvests.

SWEET POTATO HARVEST & STORAGE

Sweet potato acreage is steadily increasing in New England as it becomes clear that this crop can yield well, store well, and has a strong market. Sweet potato harvest and storage needs differ from other common New England root crops. Once harvest is completed—generally by early to mid-October—curing and storage issues continue to be important.

Sweet potato roots continue to grow until the leaves are killed by frost or until soil temperatures fall consistently below 65°F, whichever comes first. Time of harvest is often determined by digging up a few representative plants and determin-

ing the percentage of roots in different size classes. When tops of the plants turn black after the first frost, it is imperative to harvest as quickly as possible regardless of root size.

Sweet potatoes are very susceptible to damage at harvest. Sweet potato roots do not have a thick protective outer layer of cells such as that on white potato tubers. Abrasions and wounds can lead to rots in storage.

Curing immediately after harvest is recommended when sweet potatoes will be held in storage for retail or wholesale sales. Curing minimizes damage and loss during storage by healing harvest wounds. To cure, maintain roots in temperatures between 80°F to 86°F and a high relative humidity (85-95% RH) for 4 to 7 days. This forms a corky periderm layer below the damaged areas which limits microbial invasion and water loss. A greenhouse can provide good curing conditions.

A freshly harvested sweet potato is more starchy than it is sweet. During curing and storage, starches in the sweet potato are converted to sugars, improving flavor. It is recommended to wait at least three weeks after harvest before consuming sweet potatoes to permit the starches to convert to sugars for maximum eating quality.

Sweet potatoes can maintain excellent quality for up to a year in proper storage conditions. The ideal storage conditions for sweet potato are the same as for winter squash; moderately warm (55-60F) at 60-75% relative humidity. Like winter squash, sweet potato suffers chilling injury at temperatures below 55 F. Signs of chilling injury include sunken, dark areas on the tuber surface, and blackening of tubers when cut open.

Yield studies were conducted for several years by Becky Sideman at University of New Hampshire. Best yields were found in Beaugard, Covington and O'Henry (a white-fleshed variety). A good yield was 2.5 lbs per plant, equivalent to >100 lbs per 20 row-feet.

Tuber damage from wireworms can occur during the growing season and reduce marketability. More work needs to be done to understand which species is causing the damage, but likely candidates are Corn wireworm (*Malanotus communis*) or wheat wireworm (*Agriotes mancus*). Both feed on roots, stems, stolons and tubers and are pests of potato, sweet potato, other non-root vegetable crops, and grains such as wheat and oat as well as sod and grassy cover crops such as Sudangrass. Adults are most active in spring (April-June). Eggs are laid in soil and larvae feed and develop for 2, 3 or 4 years. They can survive periods without food – essentially waiting for new crops to come along. Corn wireworm adults may be especially attracted to grassy cover crops such as Sudan thus keeping fields free of those during peak egg laying is advisable. It is difficult to trace the history and cause of wireworm damage, because it often 2-4 years after eggs are laid before the damage becomes noticeable or serious. Damage is likely to be worst when larvae are nearly full grown. There are baiting methods to sample for larvae before planting. Corn wireworm larvae are also favored by wet soil conditions thus damage may be heavier in wet areas.

Voles love sweet potatoes and can take up residence in the sweet potato field, causing significant damage. Timely harvest may reduce the level of damage. Watch storage for vole activity after harvest.

Reports on Becky Sideman's sweet potato work can be found [here](#) and in the related fact sheet, "Growing Sweet Potatoes in New Hampshire."

- adapted by R. Hazzard from the *New England Vegetable Management Guide*, [nevegetable.org](#); articles by Becky Sideman, UNH Cooperative Extension; wireworm information from *J. Capinera Handbook of Vegetable Pests*.

IDENTIFYING DISEASES OF CARROTS

Carrot acreage is on the rise in New England, as more growers target expanding, year-round markets. Carrots can be affected by many bacteria, fungi and nematodes in the field and in storage. Foliar diseases may cause lower yields due to loss of photosynthetic area, difficulty in harvest if the tops are weakened, and lower marketability if the carrots cannot be sold in bunches. Root diseases can lower yields of fresh eating carrots and can spread in storage, drastically reducing yields brought to later markets. Root diseases are caused by soil dwelling organisms and therefore their incidence may vary considerably from farm to farm. Proper disease identification will help you to prevent future outbreaks by adjusting crop rotations accordingly, and prevent moving infested soil from field to field. Some of the major carrot disease symptoms are described below. If you are noticing foliar or root symptoms like those described, send a sample to your state



Alternaria leaf blight of carrot
Photo WB Langston

diagnostic lab to confirm, and take steps to protect current and future crops.

Alternaria Leaf Blight (*Alternaria dauci* and *A. radicina*) symptoms first appear along leaflet margins as greenish-brown, water-soaked lesions which enlarge, turn brown to black, and often develop a yellow halo. Older leaves are more susceptible to infection. When about 40% of the leaf is infected, the leaf yellows, collapses, and dies. Petiole lesions are common, elongate, and can quickly kill entire leaves. *A. radicina* causes similar foliar symptoms but can also produce a dry, mealy, black decay known as black rot on carrot roots held in storage.



Root knot nematode damage.

Bacterial Leaf Blight (*Xanthomonas campestris* pv. *carotae*) symptoms appear primarily on leaf margins as small, yellow, angular leaf spots which expand, turn brown to black with a yellow halo, and become dry and brittle. Leaflets may become distorted and curled. Symptoms can extend into petioles, produce a yellow-brown, gummy exudate, and occur on flower stalks. Infected umbels can be completely blighted and seed infection can occur—use treated seed to prevent introducing this disease.

Root Knot Nematode (*Meloidogyne hapla*) forms galls or root thickenings of various sizes and shapes. Growth of infected carrots is patchy and uneven and severely infected carrots exhibit forking, galls, hairiness, and stubby roots. When soil populations of *M. hapla* are high symptoms include stunted plants, uneven stands, premature leaf death, and branches and swellings on both lateral and tap roots. Marketable yield is reduced by deformities, size reduction, branches, and knobs. *M. hapla* persists in the soil and has a very wide host range so rotation is difficult but monocots are non-hosts so small grains and corn as well as resistant varieties of tomato and bean can be grown in rotations to reduce population size.



Black root rot caused by Thielaviopsis basicola.

Black Root Rot (*Thielaviopsis basicola*) occurs primarily in storage when conditions are not ideal and temperature and humidity are too high. The fungus causes superficial, irregular black lesions which occur in a random pattern. The discoloration, caused by masses of dark brown to black chlamydospores, is limited to the epidermis. The pathogen rapidly invades wounded tissue and is favored by long post-harvest periods without cooling so careful harvest and immediate cooling and storage can minimize disease impact.



White mold on carrot root.
Note presence of black sclerotia.
Photo W Brown

White Mold (*Sclerotinia sclerotiorum*) affects many vegetable crops but carrots are particularly susceptible, especially late in the season and during storage. The fungus may be present in soil, storage areas or containers. Symptoms include characteristic white mycelial growth and hard, black sclerotia (overwintering structures), which can be seen on the crown of infected carrots. In storage, the disease is characterized by a soft, watery rot with fluffy white mycelia and black sclerotia present. The fungus can also affect foliage and root crown, as pictured at left. Sclerotia can persist in soil for many years and the fungus has a very wide host range making this disease difficult to manage. Grasses and onions are non-hosts that can be used in long rotations and a biocontrol organism (“Contans”) has been shown to be effective in parasitizing overwintering sclerotia. Contans should be incorporated into infested soils 3-4 months before planting or in the fall if a susceptible crop must be planted there next spring.



White mold symptoms on overwintered, mulched carrots.

Cavity Spot and Root Dieback (*Pythium* spp.). Infections from *Pythium* spp. can occur during early root development and are favored by moist soil conditions. Root dieback symptoms appear as rusty-brown lateral root formation, or forking and stunting; symptoms that can be easily confused with damage from nematodes, soil compaction or soil drainage problems. Cavity spot often shows up later in the season near harvest. Horizontal, sunken lesions varying in size from 1 to 10 mm appear on the surface of the root and can provide an ingress for secondary fungal or bacterial infections.



Cavity spot caused by Pythium spp.
Photo S Livingston

Crown Rot (*Rhizoctonia carotae*). Early symptoms are horizontal dark brown lesions around the root crown. As the crop matures the tops may die in patches in the field and

as the disease progresses lesions join to form large, deep, rotten areas on the top part of the root. *R. carotae* can also cause crater rot and violet root rot but these diseases are less common in MA. Disease is favored by moist conditions so planting on ridges, harvesting early and without wounding, equipment and maintaining clean and proper storage conditions may minimize impact.

Scab (*Streptomyces* spp.) can cause both raised and sunken, dry, corky lesions on the carrot root, however, symptoms are rarely severe enough to cause major losses in yield or crop marketability. Avoid planting carrots in alkaline soils, which are known to favor the incidence of scab, or in potato fields with high incidence of scab, as the disease may be caused by the same organism in carrots.

-Susan B. Scheufele, UMass Extension

EXPLORE YOUR ROOTS

Before this summer is over, take some time to get to know your crop's roots – they may be trying to tell you something.

Many vegetable crops start out as seedlings with a basic tap root. As they grow, they continue to develop lateral roots and finer roots. Under good soil conditions these lateral roots should head off into the soil at about a 30 degree angle from the plant. If you see roots making a ninety degree angle, there has been some sort of barrier like soil compaction that has prevented the plant root from developing normally. It is critical to keep these lateral roots healthy as they are responsible for 90% of water and nutrient uptake after the seedling stage is complete.

At one time it was believed that plants grew roots as the rest of the plant grew during the spring, and the plant used those very same roots throughout the summer until it died in the fall. Gradually it came to be understood that roots generally need actively growing surfaces or root tips for nutrient uptake. Further careful measurements have shown that roots are constantly growing, dying and sloughing off the plant. The finest lateral roots only live about 2 weeks. This constant growing and dying of roots changes the soil close to the root system, creating a localized environment that is better for root growth and other living organisms like bacteria. Studies have shown that roots only need 10 percent of their root surface at any point in time. So why does the plant commit that many resources to roots? The extensive root system allows the plant to take nutrients and water from other areas within the soil profile, so once a location has been stripped of nutrients the root system can access them elsewhere.

Irrigation and fertigation can help to support plants with a reduced root system, but actively growing root tips are still needed for efficient nutrient and water uptake. As the root matures, the root surface becomes less permeable. Actively growing root tips have root hairs, as many as 2500 hairs per square cm. These increase the absorptive surface of the root 1.5 to 20 times that of the original young root.

Roots are responsive to the environment. Stresses like excess water or drought conditions can slow the development of new fine roots. When conditions change, a healthy plant can respond with new fine roots within 24 hours. For example, most of this summer has been dry, punctuated by occasional rains. The root systems of most plants slowed or stalled in growth during the hot dry weather, but once the rain came the plants responded quickly. Roots exist in a much more complex environment than the shoot or upper part of the plant. Like shoots, roots are affected by daily weather but roots exist and grow in the soil, a complex arrangement of mineral particles, organic matter and air- or water-filled spaces. The density, pH, water content or nutrient content of the soil can vary greatly within the area exploited by a root system. That flat soil surface hides a wealth of variability.

Most crops have the greatest root mass during their reproductive and fruiting or heading stages. For most vegetable crops that would be during harvest. That makes late summer and fall a great time to look at roots. A walk with a shovel and a quick shake of the root ball can give you some insight into how the crop has responded to soil conditions. You can wash the roots to be able to see more detail, but a quick shake will remove most of the soil and allow you to see the larger root structures.

Look at root color. Roots should be white to a creamy color if they are healthy. Look at the overall root ball. Compaction or layers that interfere with root development will appear as areas with few roots or flat roots or even thickened, almost nubby root ends. Take a look at the overall structure of the roots, does it look like it has explored the soil evenly? Or are there areas where there are few roots or lateral roots? Consider the soil conditions and the possible cause. A good root

system is consistent and well developed through the soil profile - you should not see a concentration in a small area or a witches broom effect. A larger root system picks up maximum soil nutrients and water increasing the amount available for building yield.

-Adapted by L. McKeag from articles by Anne Verhallen, Soil Management Specialist, OMAFRA, Ontario

PREPARING YOUR PESTICIDE SHED FOR WINTER

The nights are getting colder, and the days are getting shorter. Fall is moving in and many farmers are bringing in their winter storage harvests. Just as these crops require special facilities and the right conditions to make it through an unpredictable Massachusetts winter, so do other items on the farm. Now is a good time to make sure that unused pesticides are either stored or disposed of properly.

Ideally, you will have purchased only enough pesticides to get you through a single season. These products can degrade over time, as can their containers, especially under extreme temperatures. The safest way to dispose of these chemicals is to use them up, applying them to their intended targets according to the label's instructions. If you find that you are routinely storing pesticides over multiple growing seasons, talk to your dealer about special ordering smaller sized containers, or work with other growers in your community to share a larger container. Be sure all parties are certified applicators if using restricted-use products. However, if you do need to store pesticides through the winter, proper storage will help them to be usable into the following season.

The first step is taking an inventory of your pesticide storage area. This will help you make purchasing decisions for next season, and would be very useful in the event that there is a spill or other emergency.

Record Keeping. Record what you have and in what quantities, as well as purchase or delivery dates to be sure you know how old your materials are. The average shelf life of many of these products is two years. Also be sure that the label and all of the use instructions are in good condition and are legible. Labels may also have been updated to reflect current research, such as the product's environmental or pollinator precautions. New, current labels can be obtained from your pesticide dealer, or can be found on-line at manufacturer's websites or the Crop Data Management Systems searchable database at <http://www.cdms.net/LabelsMsds/LMDefault.aspx>

Registration. Make sure that all the products that you have on your farm are registered by the EPA, and in Massachusetts by the Massachusetts Department of Agricultural Resources (MDAR). State registrations are typically renewed on an annual basis. Remember, it is illegal to use or store any pesticide that is not currently registered in the state. Besides, if a pesticide you have is not registered, there is a good chance that it is no longer effective and may even be hazardous. Verify before using any stored product that it's registration status has not changed. Materials that are not registered are immediately reclassified as waste, and paying to get rid of waste can be more expensive than purchasing the product in the first place!

You can easily check the registration status of a product or active ingredient with these searchable databases. Below are the links for Massachusetts:

[National Pesticide Information Retrieval System \(NPIRS\)](#)

[Pesticide Product Registration Information at Kelly Solutions](#)

You can also contact the MDAR Pesticide Bureau at 617-626-1720 or visit their website at <http://www.mass.gov/agr/pesticides/index.htm>.

Avoid temperature extremes and excess humidity. Pesticides should be stored between 40° and 100° F in a lockable room or cabinet that is clearly marked for pesticide storage, on plastic or metal shelves – wood is not ideal as it will absorb spills.

Liquid formulations should be stored inside of metal or plastic bins in case their original containers break or corrode. Liquids should never be stored above powders as they may leak and cross-contaminate these products. Allowing liquid pesticides to freeze can result in separation or inactivation of the ingredients. This guide to [Cold Weather Storage and Handling of Liquid Pesticides](#) from Montana State University provides a chart of many common pesticides and their toler-

ances for freezing/thawing, as well as how to handle frozen products to maximize their efficacy.

Powders, dusts, and granules must be kept dry. Excess humidity will cause wettable powders to harden and prevent them from properly going into suspension. If a dry product may be damaged by moisture, a quick way to check if it will go into suspension is by adding a small sample to water in a mason jar at the same rate that you would apply it in the field, capping it tightly, and shaking it. You will be able to see if it is able to dissolve. If it won't dissolve in the jar, it won't dissolve in a tank mix either, and you would end up spraying weak or inconsistent concentrations on your crops.

Disposal. Make arrangements to dispose of unwanted or unusable pesticides. Currently Massachusetts does not have an active statewide pesticide disposal program. Contact your city or town office or regional waste management group for information on hazardous waste collection events and local facilities. Residents of Franklin County, MA should see the Upcoming Events section of this issue for information on hazardous waste and pesticide container recycling events happening in September and October.

Always refer to the label for specific storage instructions. More information on pesticide storage and waste guidelines from MDAR is available here:

[Pesticide Storage Mixing and Loading guidelines for applicators.](#)

[Hazardous Waste Requirements for Commercial Pesticide Users](#)

-by L. McKeag with source information from Natalia Clifton, UMass Extension Pesticide Educator; links referenced above; and from "Winter Storage of Pesticides" by Michelle Infante-Casella, Agricultural Agent, Rutgers University

UPCOMING EVENTS

Twilight Meeting at Tangerini's Farm

When: Wednesday, September 18, 4pm to 7pm

Where: Tangerini's Spring Street Farm, 139 Spring Street, Millis, Massachusetts 02054

Join us at Tangerini's Farm for a vegetable twilight meeting, hosted by Laura and Charlie Tangerini. We will talk about production and storage practices, as well as the work they have been doing with UMass Extension to implement IPM strategies on their farm. We will also have as a guest Heather Vitella, who runs Cover Crop Marketing and with whom Laura put together an e-book for CSA first-timers called The CSA Survival Guide, to discuss strategic marketing for farmers.

Vermont Crop Storage Workshops

First dates are next week – Tuesday, Sept. 17 & Thursday, Sept. 19. Sign up early!

UVM Extension with support from the USDA's Northeast Sustainable Agriculture Research and Education program will offer five full day workshops on crop storage throughout Vermont this fall. More info: <http://blog.uvm.edu/cwcal-lah/storageworkshop/>. Registration link: <https://www.eventbrite.com/event/7979513941>

Dates and Locations: 9/17 in Brattleboro; 9/19 in Rutland; 10/9 in White River Junction; 10/10 in St. Johnsbury; and 10/16 in Shelburne

Franklin County Hazardous Waste Collection Day

When: September 21, 2013

Where: Collection sites at Greenfield Community College and Orange Transfer Station

Franklin County farmers can safely dispose of old or otherwise unwanted pesticides and other hazardous waste at this collection event. Take this opportunity to clean out that shed, and reduce the risks of storing hazardous chemicals on your farm through the winter. Contact the Franklin County Solid Waste Management District at 413-772-2438 to make arrangements. You must PRE-REGISTER to participate. Businesses will be charged for disposal cost. For residents and businesses in Franklin County, MA.

Franklin County Pesticide Container Recycling Event

When: 1st week of October

Where: Details to be announced

The Solid Waste District is working with the Ag Container Recycling Council to hold a recycling collection for triple-

rinsed pesticide jugs. The recycling truck will be in our area sometime in the first week of October. You must PRE-REGISTER if you plan to participate - call Jan at 772-2438 or email at fcswmd@crocker.com. Pre-registrants will receive details on the date, time, and location of the collection. The next collection event will be in June 2014. This project is funded through a grant from MassDEP.

Food Safety Modernization Act (FSMA) Information Session

When: Wednesday, September 25th, 6pm - 8pm

Where: Southworth Library, 732 Dartmouth St., Dartmouth, MA

The FDA is accepting comments on its proposed FSMA regulations until November 15th. The session will cover the proposed regulations under the Produce Rule and the Preventive Controls Rule. Please [RSVP here](#) to attend this session or contact [SEMAP](#) with any questions if you are unable to attend but would like to learn more and submit a comment. This event is free and open to all. Visit the [MFBF site](#) for tips on commenting, and the [National Sustainable Agriculture Coalition's FSMA website](#) for an excellent overview of the issues.

UMass Extension Greenhouse Crops and Floriculture Program - Fall Flower Grower's Program

When: Wednesday, October 16, 2013

Where: Pioneer Gardens Inc. 198 Mill Village Road, Deerfield, MA

For more information contact Bob Luczai, MFGA: 781-275-4811 or Tina Smith, UMass Extension: 413-545-5306

UMass Food Science Department - Industry Short Courses for Value Added Products:

HACCP Certification Workshop

December 3-5, 2013

This workshop will provide the tools for you to complete the requirements for Hazard Analysis Critical Control Point (HACCP) certification. The course will include interactive exercises to help illustrate HACCP planning with an emphasis on FDA regulated food products. For HACCP registration and additional information, [click here](#).

Better Process Control School

January 7-10th, 2014

Better Process Control School offers instruction which fulfills the FDA and USDA Good Manufacturing Practice requirements to certify supervisors of acidification, thermal processing and container closure evaluation operations during the canning of low-acid or acidified foods. UMass Extension and MA Department of Agricultural Resources encourage farmers who grow specialty crops with an interest in value-added processing to apply for available scholarships to participate. The primary objective of this scholarship is to increase the food safety processing skills of farmers interested in producing shelf-stable low-acid and acidified specialty crops. For BPCS registration and additional information, [click here](#).

Scholarships are available for both courses to significantly reduce registration costs for farmers. Contact Amanda Kinchla for a scholarship application: amanda.kinchla@foodsci.umass.edu 413-545-1017

Vegetable Notes. Ruth Hazzard, Katie Campbell Nelson, Lisa McKeag, Susan Scheufele, co-editors. Vegetable Notes is published weekly from May to September and at intervals 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.