UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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In this issue:

Crop conditions

Early summer harvest season is humming along now, with more farms bringing in field tomatoes and sweet corn, though the field fruiting crops like peppers and eggplants are still on the horizon. The weather has been great for crops and weeds alike – everything is growing. The regular rains have meant little irrigating, but have made it hard for some growers to get in and cultivate, or to make timely pesticide applications. Just as soon as they start to find a rhythm in the summer, many growers are already thinking ahead to the chilly fall, and planting the crops that will get stored and distributed through the winter! Join us next Wednesday afternoon for a field walk at Waltham Fields Community Farm for a demonstration on small sprayer calibration, an update on spotted wing drosophila, information on taking back a raspberry planting from the weeds, and a hands-on scouting demonstration in vegetable crops!

Oh the difference some fertilizer makes! These two rows of zucchini were planted the same day but one was fertilized and not the other.

Pest alerts

Vegetable scouting sheets can be found on the UMass Extension Vegetable Program website. When not given here, refer to the New England Vegetable Management Guide for scouting thresholds and treatment options.

Allium: Onion thrips pressure was very low in an onion field scouted in Worcester Co., MA and just at threshold in untreated fields in RI. Periodic (just about weekly) heavy rains may be to thank for keeping thrips, which are favored by hot, dry weather, off of plants. A field in Bristol Co., MA, however, was well above threshold, so even with the rain, continue to scout and treat if thrips reach 1 per leaf. Salt marsh caterpillars were found on onions in ME. Onions in a field in Worcester Co., MA were diagnosed with an as-yet undetermined bacterial disease. Symptoms were water-soaked, brown leaf tissue in the center of otherwise healthy-looking plants. Warm, humid, wet weather favors bacterial diseases. Leaf infections can move down into onion scales, making the bulbs unmarketable. No good chemical controls exist for bacterial disease in onions, but one option is to scout for and pull any affected plants. Bulbs can be sold fresh if they are still unaffected and have reached marketable size. A number of reports of garlic bloat nematode have come in from locations in ME; symptoms are dwarfed, yellowing plants, with significantly reduced roots.

Bacterial diseases in onions can spread from leaf into bulb scales.

Basil: No cases of basil downy mildew have been confirmed in New England so far, but reports of the disease on the online monitoring site maintained by Meg McGrath of Cornell University indicate that the disease is being observed at garden centers and in home gardens across the US. Scout plants regularly and please alert us if you are fairly certain you have

the disease so that we can alert growers. You can send a photo to umassvegetable@umext.umass.edu. Symptoms are yellowing of the leaves between veins and dark furry sporulation on the underside of the leaf.

Basil downy mildew causes furry dark spourlation on the underside of the leaf.

Basil bacterial leaf spot.

Brassica: In an untreated cabbage field in Franklin Co., MA and untreated Brussels sprouts field in Bristol Co., MA, severe damage from **imported cabbage worm** was observed but the first generation seems to have been completed or large larvae present now will soon be pupating. Small **diamondback moth** caterpillars are starting to move in. An untreated field in Washington Co., RI was 40% infested with either ICW or DBM. Before head formation in heading crops, use a 35% infestation (% of plants with one or more caterpillar present); for leafy greens or after head formation, the threshold for treatment is 15% infestation. Continue to scout for **flea beetles**; use a threshold of 1 beetle per plant if plants are <12" or if leaf damage exceeds 10%. Scouts in MA have not seen much in the way of brassica diseases, but conditions are favorable for **black rot**, which has been diagnosed in kale and Brussels sprouts in VT. Scouts in RI observed a brassica field where 70% of plants were affected by **Alternaria** on their lower leaves. Destroy and incorporate older plantings to hasten decomposition; rotate! Apply fungicides to long season brassicas.

Location	Weekly SVB reported
Western, MA	
Amherst	21
Deerfield	9
NH	
Litchfield	43
Hollis	33
Mason	5
Burlington, VT	0
Kingstown, RI	0

Corn: **European corn borer** trap captures continue to be low to none in MA and NH, except for a count of 16 moths in Sharon, MA. According to growing degree days, a second generation should start soon: with flight at 1400 GDD; first eggs at 1450 GDD; and egg hatch at 1550 GDD. Scout fields with tasseling and silking corn now and treat at a threshold of 15% infestation. A simple sequential scouting guide is available at the UMass Vegetable program website here: Sweetcorn IPM Guide. **Corn earworm** moths are being captured where traps are up, at numbers ranging from 3 in NH up to 20 at one site in Southeastern MA, with only a couple sites reporting no moths. Recommended spray intervals range from 4 to 6 days. See article in the July 2nd issue of Vegetable Notes on corn earworm management options. **Fall armyworm** larvae were found in tassels in VT, and traps in NH are beginning to catch moths in low numbers. FAW traps are also capturing a number of different look-alikes; be sure to confirm the identity of captured moths before making spray decisions. We're seeing breakdowns in sweet corn herbicide programs after so much rain.

Location	ECB Weekly Total	CEW Weekly Total	Spray Interval for CEW
Western, MA			
Hadley	0	na	--
Sheffield	0	4	*5 days*
South Deerfield	0	na	--
Whately	0	1	*no spray*
Central & Eastern MA			
Leominster	na	na	--
Millis	5	8	*4 days*
Sharon	16	20	*4 days*
Swansea	na	na	--
NH			
Litchfield	0	3	*6 days*
Hollis	0	3	*6 days*
Mason	0	0	*no spray*
Burlington, VT	7	0	*no spray*
Kingstown, RI	na	na	--

Cucurbit: **Squash vine borer** trap catches are high again in NH, averaging almost 20 moths per trap. Catches went down last week, but were up again this week. We may start seeing damage soon, as young larvae in plant stems reach 3rd or 4th instars. Scouts are beginning to see **squash bug** egg masses – 1.8 egg masses per plant at a field in RI; there is no threshold set for adults or nymphs, but scout for egg masses and treat to target nymphs when you see one egg mass per plant. Crops most susceptible to squash bug are yellow summer squash, zucchini, Hubbard squash, and thick-stemmed pumpkins. Continue to scout young cucurbit plants for **striped cucumber beetle**. SCB vectors bacterial wilt, and will feed on stems and fruit as well as leaves; stem feeding

can make stems more vulnerable to wind damage. Protect young succession plantings with kaolin (Surround) sprays. **Cucurbit downy mildew** continues to spread in New York, and conditions are favorable for disease development in MA, though no infections have been reported to date. No new cases of powdery mildew found in MA, but this is the time when we usually start to see it, and the threshold for treatment is low, so scout now to stay ahead of this disease (see article this issue). Fruit rot caused by the fungus ***Choanephora cucurbitarum*** was diagnosed on zucchini in VT, and **Septoria** was diagnosed on pumpkin in MA, in a field that had been in pumpkins for the past three years – time to rotate this field to a new crop group.

Choanephora cucurbitarum fruit rot.

Solanaceous: A second case of **late blight** was diagnosed on potato in Northern VT, in Orleans Co. Protective sprays should be applied to both potatoes and tomatoes now. See the MA late blight DSS for spray intervals. **Black leg of potato,** caused by the bacterial pathogen, *Erwinia carotovora* subsp. a*troseptica*, was confirmed last week in Hampshire Co., MA and seen in Plymouth Co., MA this week. This disease is most often introduced on infested seed. If symptoms are scattered in the field, rogue out infected plants including tubers to minimize spread of disease. All stages of **Colorado potato beetle** were present in potato fields scouted in the region, but in relatively low numbers, though a field scouted in VT averaged 4 large larvae per plant where they haven't been able to get in to spray because it was too wet. **Potato leafhopper** numbers are going up, as are reports of hopperburn; PLH nymphs seen in high numbers on multiple crops, including apples, beans, and small fruits, as well as ornamental plants such as hollyhocks (a good indicator plant for PLH). The UMass diagnostic lab has confirmed reports of the bacterial diseases **pith necrosis** (*Pseudomonas corrugate*) and **bacterial canker** (*Clavibacter michiganensis* pv. *michiganensis*) on tomatoes from several locations in MA. The plant bug, **garden fleahopper**, an uncommon pest in the Northeast, was found feeding on greenhouse tomato leaves in Worcester Co., MA. Damage was originally thought to be caused by Western flower thrips. Another relatively new pest in the Northeast, **yellow striped armyworm** (see photo) were found in tomato high tunnels in RI. These can do a lot of defoliating, often right around the same time as tomato hornworm. Bt products are effective against both pests.

Yellow-striped armyworm.

Multiple: Oriental beetles and Japanese beetles were seen on eggplants, cucurbits, and other crops. See article this issue for more on scarab beetles.

SCARAB BEETLES: JAPANESE, ORIENTAL AND ASIATIC GARDEN BEETLES ARE ACTIVE

Japanese beetles have been flying for the past week or two. Oriental beetles and Asiatic garden beetles are also actively flying now and, though less damaging, may appear in vegetable fields as well. All species are feeding and starting to lay eggs.

Different instars of Japanese beetle larvae.

There are four species of scarab beetles that are common in New England turf, fruit and vegetable crops, though none are native to the US. Japanese beetles are the most common and widely distributed but Oriental and Asiatic garden beetles are expanding their range and activity.

Japanese beetles (*Popillia japonica)* adults are about half an inch long, with a metallic green head. The wings are shiny copper or bronze color, and there are a few tufts of white "fur" along the side of each wing when it is folded back over the body. The adults are active in daylight and feed on many different kinds of trees, fruit and flower crops. Fruit and ornamental plants are preferred, but beetles can congregate in vegetables also. In vegetables, adults can cause silk clipping in corn, and leaf damage in sweet basil, collards, other greens, green beans, eggplant, asparagus, rhubarb, and peppers. Though numbers may be high, there is no need to treat unless actual feeding damage is significant. In corn, if there are more than two Japanese beetles per ear and corn is less than 50% pollinated, a pesticide application may be warranted to reduce clipping and ensure adequate pollination.

Asiatic Garden Beetles (*Maladera castanea* (Arrow)) are about half as long as a Japanese beetle adult, and somewhat more "plump" or domed in appearance. They are reddish-brown or copper-colored. They often are found near roots of

From top to bottom: Japanese beetle, Asiatic garden beetle, and Oriental beetle.

plants when one is weeding. Adults feed at night, so one may find damage without seeing the beetles. During the day they hide in the loose soil or mulch around the base of the plants. Scout with a flashlight at dusk or during the night, or sift through soil to find them. Larvae feed on beet, carrot, corn, lettuce, onion, Swiss chard, and strawberry. Adults feed on carrot, beet, parsnip, pepper, cabbage and turnip.

Oriental Beetles (*Anomala orientalis* (Waterhouse)) fly at night, but are very active during the day as well. The beetles are smaller than Japanese beetles, and usually are a rather mottled gray with black splotches. The pattern and color varies. The antennae are branched and are quite striking if you take a close look. Oriental beetles have a long flight period – through early August – and are very mobile. Adults tend not to feed heavily in vegetable crop foliage but show up in many crops. Grubs damage may be worse in drought years and in weedy fields, but is not commonly a problem in vegetable fields and crops, though this is not well studied.

Life Cycle. The life cycle of the Japanese beetle fits most of the species of grubs we encounter in New England, with minor variations. They have a one-year life cycle, with adults emerging from the soil in early July in most of Massachusetts (later farther north) to feed and mate. The females burrow into the soil (often in or near wide expanses of grass or sod) to lay eggs which hatch into tiny grubs (cream-colored larvae, C-shaped, with brown heads) that feed on roots of grasses and other plants (especially corn). Grubs molt twice by the middle of September, and continue feeding until the soils begin to cool down. In late fall the grubs migrate downward through the soil profile, staying below the frost line throughout the winter. In the spring as the soils warm up, the grubs move back into the root zone and resume feeding for about six weeks. By the middle of June, most grubs have completed their feeding requirements and pupate (still in the soil) for about a week before emerging as new young adults.

Management. On turf, insecticide controls normally target young grubs just as they begin to emerge from eggs. In vegetables, managing the grub stage may not be feasible (or necessary) since the grubs are most likely feeding elsewhere. Vegetable growers could run into problems with grub damage if turf or sod is plowed under in fall or spring and followed by a spring vegetable crop. A fallow or very weedy field may generate a hefty population of Oriental or Asiatic garden beetles the following year.

Insecticides may be needed to control adult beetles if numbers are high and damage is significant. The New England Vegetable Management Guide lists products for Japanese and/or Oriental beetles in basil and sweet corn. For controls in a crop where these beetles are rarely a pest and therefore not mentioned in the Guide, check the label of commonly used broad spectrum synthetic pyrethroids, carbamates, and neonicotinoids (as foliar spray). Organic options include neem/azadiractin products and pyrethrin.

- R. Hazzard, adapted from Turf Management Update, Pat Vittum, Turf Entomologist, UMass, Beth Bishop, Michigan State University, Michael Seagraves, Cornell Cooperative Extension, and Ann Hazelrigg, University of Vermont.

MANAGING CUCURBIT POWDERY MILDEW SUCCESSFULLY

Effectively managing powdery mildew is essential for producing a high-quality cucurbit crop. This foliar, fungal disease is common in the northeast because the pathogen produces an abundance of asexual spores easily dispersed by wind, thus it can spread widely, and the pathogen can produce a sexual spore in fall that enables it to survive over winter. Leaves affected by powdery mildew die prematurely which results in fewer fruit and/or fruit of low quality (poor flavor, sunscald, poor storability).

Powdery mildew is managed with resistant varieties and fungicides. An integrated program with both management tools is needed to achieve effective control because the pathogen is adept at evolving new strains resistant to individual tools that thus are not controlled as well by the tool. It is more difficult for new pathogen strains to develop when an integrated program is used, and effective control is more likely.

Resistant varieties are now available in most crop groups with new varieties released most years. Select melons with

resistance to pathogen races 1 and 2. They provided good suppression in 2012. There are many types of resistant melons now. Select squash and pumpkins with resistance from both parents (homozygous resistance) when possible. This term is used in a few catalogues (for example Outstanding Seeds) whereas others use terms like 'high resistance' and 'intermediate resistance' to generally refer to homozygous and heterozygous resistance, respectively. Degree of disease suppression obtained with a variety also depends on modifying genes present. Resistant squash and pumpkin varieties have not provided as effective control in recent years as before. But they remain an important tool. Plant breeders are actively searching for new sources of resistance to powdery mildew.

Early symptoms of powdery mildew on lower leaf tissue.

Fungicide program. The most important component of an effective management program is an effective fungicide program. And the key to that is using mobile fungicides targeted to powdery mildew. Mobile fungicides are needed for control on the underside of leaves. Because these fungicides have targeted activity, additional fungicides must be added to the program when there is a need to manage other diseases such as downy mildew and Phytophthora blight.

Alternate among targeted, mobile fungicides and apply with protectant fungicide to manage resistance development and avoid control failure if resistance occurs, and also to comply with label use restrictions. The powdery mildew pathogen has a long history of developing resistance to fungicides (it was the first occurrence of resistance in the USA), thus a diversified fungicide program applied to resistant varieties when possible is critical for success. Always implement a resistance management program. The goal is to delay development of resistance, not manage resistant strains afterwards.

When to apply fungicides. The action threshold for starting applications is one leaf with symptoms out of 50 older leaves examined. Examine both surfaces of leaves. Starting treatment after this point will compromise control and promotes resistance development. If the threshold is inadvertently missed, to minimize the reduction in control that will occur, consider starting the program with a DMI fungicide or Torino; do not use Quintec in this situation. Powdery mildew usually begins to develop around the start of fruit production. Protectant fungicides applied before detection will slow initial development. After detection, continue applying fungicides weekly. Conditions are favorable for powdery mildew throughout the growing season.

Recommended targeted fungicides. Alternate among targeted, mobile fungicides in the following 4 chemical groups, and apply with protectant fungicide to manage resistance development and avoid control failure if resistance occurs, and also to comply with label use restrictions.

Torino (FRAC Code U6) is a new fungicide with a new mode of action. It has exhibited excellent control in fungicide evaluations conducted recently. Activity is limited to powdery mildew. It can only be applied twice to a field in a 12-mo period. Consecutive applications are not recommended. REI is 4 hr and PHI is 0 days. Torino is not registered in NY.

Quintec (FRAC Code 13) has been consistently effective in fungicide evaluations. Activity is limited to powdery mildew. Labeled crops are pumpkin, winter squash, gourd, and melon. The crop rotational restriction is 12 months. Recent crop additions to the Quintec label have increased the options of what can be planted within 12 months of the last application. The Quintec label specifies no more than two consecutive applications plus a crop maximum of four applications. It is the only fungicide in this chemical group available in the USA. REI is 12 hr. PHI is 3 days.

DMI fungicides (FRAC Code 3) include Procure, Rally, Tebuzol, Folicur, and Inspire Super. Resistance is quantitative. Highest label rate is recommended because the pathogen has become less sensitive to this chemistry. Efficacy has varied in fungicide evaluations. Procure applied at its highest label rate provides a higher dose of active ingredient than the other Code 3 fungicides. Five applications can be made at this rate. REI is 12 hr. PHI is 0 days. Powdery mildew is the only labeled cucurbit disease for these fungicides, except for Inspire Super, which contains another active ingredient (Code 9) and is labeled for additional diseases. PHI is 7 days.

Carboxamide fungicides (FRAC Code 7) currently registered are Pristine, Fontelis, and Luna fungicides (labeled for use only on watermelon so far; there are 4 Luna formulations). Strains of the powdery mildew pathogen resistant to Pristine have been detected and likely are the reason its efficacy has varied. The newer fungicides in this group are recommended instead of Pristine as they are considered to be more active. All are labeled for additional diseases. Fontelis can be applied 4 times at highest labeled rate with no more than 2 consecutive applications. REI is 12 hr. PHI is 1 day.

In a fungicide evaluation conducted in 2012 in NY, Quintec was very effective, Procure was moderately effective, while Pristine and Fontelis were ineffective when tested alone (this is neither a labeled nor recommended commercial use pattern for these fungicides; it is done in efficacy evaluations to determine if resistance affects control). Very good to excellent control was achieved with Quintec applied 3 times alternated with Procure and Pristine or twice alternated with Torino and Luna Sensation for a total of 5 applications.

No longer recommended. Resistant pathogen strains are sufficiently common to render the following fungicides ineffective: Topsin M (FRAC code 1; MBC fungicide) and QoI fungicides (Code 11), which include Quadris, Cabrio and Flint. Resistant strains continue to be detected commonly every year in NY where monitoring is being conducted.

Recommended protectant fungicides. Chlorothalonil, sulfur, copper, oils (mineral and botanical), potassium bicarbonate, and biologicals. Melons are sensitive to sulfur especially when hot; there are tolerant varieties. There are many fungicides with contact activity for powdery mildew. Mancozeb is an exception.

Once cucurbit downy mildew (CDM) has been reported in your area this disease should also be managed with targeted fungicides. Importantly, the targeted materials listed for PM control above will not have any effect on CDM. Cucurbit downy mildew can be effectively controlled using the following synthetic fungicides: Ranman, Gavel (pre-mixed with mancozeb), Curzate, Tanos, Forum or Zampro always in a tank-mix with a protectant fungicide. Once targeted fungicides are called for, alternate modes of action with each spray, keeping a 7-day spray interval (Curzate and Tanos should be followed up with another targeted application at a 5 day interval due to limited residual). It's important to be diligent with managing fungicide resistance development with this pathogen as well, as it is known to rapidly evolve resistance to many chemical classes. Resistance is documented for Ridomil and the strobilurin fungicides (e.g. Quadris, FRAC Group 11), and now reduced efficacy of Presidio and Previcur Flex is being reported, indicating resistance to these materials has developed.

Symptoms of CDM on upper and lower leaf surfaces.

In summary, to manage powdery mildew effectively in cucurbit crops: 1) select resistant varieties, 2) inspect crops routinely for symptoms beginning at the start of fruit development, and 3) apply targeted fungicides weekly with protectant fungicides and alternate amongst available chemistry based on FRAC code, starting at the action threshold of 1 affected leaf out of 50 older leaves. Add new fungicides to the program when they become available; substitute new for older product if they are in the same FRAC group.

Please Note: The specific directions on fungicide labels must be adhered to -- they supersede these recommendations, if there is a conflict. Note that some products mentioned are not yet registered for use on cucurbits. Check labels for use restrictions. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

--Written by Margaret T. McGrath, Cornell University, and Adapted by Susan B. Scheufele

SAP BEETLES IN SWEET CORN

Picnic beetle.

Sap beetle larvae and feeding damage.

Sap beetles have generally been thought of as secondary pests of sweet corn, usually associated with damage caused by caterpillars, but on some farms they are a regular and troublesome pest in early sweet corn plantings – even where caterpillar control has been excellent. Early sweet corn varieties tend to have poor tip cover, allowing sap beetle adults to lay eggs near the tip, where tiny larvae burrow into the kernels, and make the ears unmarketable (see photo). Sap beetle adults have already been observed in early corn plantings in MA, so now is the time to be scouting if this pest has been a problem on your farm in past years. Sap beetles can also be pests of strawberry and other fruits, so they tend to be more of a problem on farms that grow both fruit and corn. The beetles are attracted to decaying plant material, particularly fruit. Growers with sweet corn plantings that are close to peach or apple orchards, where over-ripe dropped fruit can attract adult beetles, are vulnerable to invasions into corn, and should pay particular attention for this pest when scouting. Sap beetle infestations tend to be worse in a hot, dry year.

Life Cycle and Damage. Sap beetles overwinter as adults, often in the woods near previous feeding sites. Early sweet corn silk is an attractive early-season feeding and egg-laying site, especially when fruits and other hosts are rare. There are several generations per year. The most common sap beetles in corn are the dusky sap beetle (*Carpophilus lugubris*), which is black and plain (3.5-4.5 mm long), and the four-spotted sap beetle also known as picnic beetle, (*Glischrochilus quadrisignatus*) which is black with four irregular yellow spots (5-6 mm long). The most common species in strawberries is the strawberry sap beetle (*Stelidota geminate*).

Adults are first noticeable about the time that tassels and silk appear. They may also move in closer to harvest, when kernels fill and silks are dried or decaying. They may invade corn borer tunnels or areas with other insect or bird damage, but are also found in corn that is free of caterpillar damage. They lay eggs in silks and the tip of ears. Eggs are milky white and resemble tiny grains of rice. The larvae are small, pinkish white or creamy colored grubs about ¼ inch long. They may hollow out kernels of the upper half of the ear, making ears unmarketable. Adults may also hide between the layers of the husk. The problem can easily be overlooked until harvest, when adults show up in harvest bins, and larvae are found in the ears.

Monitoring and sprays. Sample for sap beetles when silks begin to wilt, and scout regularly until harvest. Inspect the silk area at the tip and the husks of 50-100 ears across the field, and determine the percent of ears infested with adults, eggs, or larvae. Sprays for other ear pests usually control sap beetles, but if other pests are absent and more than 10% of ears are infested with sap beetles, treat for sap beetles. Sprays in the final 7-10 days before harvest may be needed if sap beetles are present at that time – timing is important. Pyrethroids used to control ECB and CEW will reduce sap beetle, but if populations are high, a combination of pyrethroid and methomyl (Lannate) may provide additional control. Bt hybrids that produce Bt toxin at the cellular level do not protect against sap beetles, so you may need to spray even in the absence of ECB and CEW in those plantings. This past winter Jude Boucher summarized results of spray trials conducted by Gaylon Dively at UMD that indicated sprays on the 3rd and 6th days of silk were most effective and additional, later sprays did not improve control. Furthermore, Gaylon found that Sevin and Warrior were most effective, followed by permethrin and larvin, then lannate. When spraying for sap beetle please consult the labels and try to spray in such a way as to protect bees.

Cultural practices. Ears with exposed tips, especially super sweet and Bt varieties, are especially susceptible to infestation. To prevent or reduce damage, select varieties that have good tip cover, use clean cultivation, control ear-infesting caterpillars, and remove or bury decomposing fruit (especially in fall to reduce the size of the overwintering population) on a regular basis. Sanitation is important to prevent successful overwintering and reproduction during the season. Bury corn residue, especially decomposing ears; remove or bury alternate hosts such as rotting tree fruit or discarded vegetables. Burial should be deeper than 10 cm.

--Ruth Hazzard and Susan B. Scheufele

Events

IPM Field Walks

In this series, learn to identify and scout fruit and vegetable pests and select integrated pest management strategies that work for you whether you are a beginner, experienced, organically certified or not! We will walk farm fields with Extension Educators and farmers in Massachusetts, Rhode Island, and Vermont to learn how each farm is practicing IPM. Bring a hand lens if you have one. This series is funded in part by a Northeast IPM Center grant.

- **July 22nd, 4-6 pm**
  Waltham Fields Community Farm, 240 Beaver Street, Waltham, MA
  Learn to calibrate a backpack sprayer, select effective OMRI approved materials and calculate the economic threshold of vegetable crops after being trained to scout in the field with farmers Erin Roberts and Zannah Porter and UMass Extension staff Lisa Mckeag, Susan Scheufele and Rich Bonanno. **2 pesticide license contact hours available in the vegetable category.**
- **July 27th, 4-6 pm**
  Simple Gifts Farm, 1089 North Pleasant Street, Amherst, MA
  Come to this field walk to learn how to use pheromone traps to monitor Squash Vine Borer, use a microscope to identify plant pathogens, and learn to scout multiple vegetable crops with farmer Jeremy Barker Plotkin, UMass Extension staff Katie Campbell-Nelson, Lisa McKeag and Plant Diagnostician Angie Madieras. Leave after a discussion of control strategies for these pests on organic farms. **2 pesticide license contact hours available in the vegetable category.**
- **August 25th, 3:30-6pm**
  Hurricane Flats, 975 S. Windsor St. South Royalton, VT
  Join us to learn how to scout for disease and insect pests in the field and discuss effective organic control strategies with farmer Geo Honigford, Ann Hazelrigg and Gabriella Maia (UVM Disease Diagnostic Laboratory) and Katie Campbell-Nelson (UMass Extension Vegetable Program). Sponsored by Vermont Vegetable and Berry Growers Association and NOFA-VT.

Professional Development Soil Health Workshop Series

The University of Massachusetts Extension has been funded by the Sustainable Agriculture Research and Education Professional Development Grant (2014-2017) to provide educational opportunities to Agricultural Service Providers and Farmers in Soil Health topics.

- **July 16th, 3-5 pm**
  Diagnosing Streams: Flood Protection Remedies for Farm and Forested Lands, 89-91 River Rd. South Deerfield, MA
  Christine Hatch, UMass Extension Assistant Professor, Geosciences, and Benjamin Warner, UMass PostDoc, Geosciences will present the latest science on "diagnosing streams" and provide best practices for farm and forest land managers to protect their land from the effects of stream flooding. Their goal is to help agriculture, forestry, and rural communities develop greater resiliency during extreme weather events. Christine and Benjamin are members of a New England "Fluvial Geomorphology" research group. The group has studied successes among restoration responses to Hurricane Irene in Massachusetts and Vermont and will be sharing findings from this work with Agricultural Service Providers in Massachusetts.

- **August 17th, 3-5 pm**
  Soil Tests for New England and interpreting them for Phosphorous Management, 89-91 River Rd. S. Deerfield, MA
  Tom Morris, University of Connecticut Professor, Plant Science will present methods of different soil extractions and tests, with a focus on those appropriate for New England soils. With his experience in field research on nitrogen and phosphorous, Tom will present Agricultural service providers with a basic understanding of the chemistry of Phosphorous in the soil, how it behaves, how best to assess P status of soil in different growing systems, how to assess potential loading from soil applications of fertilizer, compost or manure, and how to mitigate soil with excess Phosphorous aside from not adding more (e.g., cover crops or other ways to use up or sequester phosphorous to prevent off site movement or contamination.
  Tom Akin, Natural Resource Conservation Service Agronomist will present work on evaluating a new soil extraction method for New England with data from Massachusetts farms. The new Haney Soil Health Test is being tested in Massachusetts to evaluate it's ability to better predict active carbon and other indicators of soil health.

2015 NOFA Summer Conference

When: Friday, August 14 to Sunday, August 16, 2015
Where: UMass Amherst Campus

This year's main conference features 144 individual sessions with 27 different topic areas. Workshops address organic farming, gardening, land care, draft animals, homesteading, sustainability, nutrition, food politics, activism, and more. The theme for this year's Conference is "Healing the Climate, Healing Ourselves: Regeneration through Microbiology".

This year's conference will include sessions with UMass personnel:

- Amanda Brown, Director of the UMass Student Farm; Tour of the UMass Ag Learning Center
- Lisa McKeag, Extension Vegetable Program; Pest Scouting in the Field at Simple Gifts Farm
- Susan Scheufele, Extension Vegetable Program; Integrated Pest Management in Brassicas

THANK YOU TO OUR SPONSORS

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