



UMass
Extension

Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



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CROP CONDITIONS

Some growers were lucky to get a rain shower or two this week, and crops got a little respite. One grower did a little ‘happy dance’ when he got 4/10ths of an inch of rain this week. The rain was not enough though, and some towns or fields were skipped over altogether. Drought conditions are still prevalent throughout the state, and farmers everywhere are moving pipes and pumps from field to field and crop to crop trying to keep up. We even saw sweet corn being irrigated in Franklin Co., MA last week! At our IPM field walk this week in Norfolk Co., the farmer laid irrigation in potatoes even while we scouted them (photo)—this was an efficient way to get his workers into the field to join us!

Some growers are seeing herbicide carryover problems this year due to lack of snow cover in the winter and then low overall rain this season. Moisture is one of the conditions needed to help with herbicide breakdown. Herbicide breakdown is also dependent on light, air, pH, soil texture. Growers practicing no-till may struggle because they are not exposing the treated soil to the air to let residual herbicides volatilize. Check labels carefully for plant-back restrictions. Cultivation has been very effective for weed control between beds. Tonight would be a great time to make an herbicide application if you need it. Rain is finally expected in thunderstorms tomorrow evening that will water in the materials applied. But be careful when using surfactants or crop oils if we don’t get the needed rain tomorrow as crop injury may occur. As one clever Extension



educator always said: avoid spraying herbicide if adding % humidity and temperature (°F) exceeds 150 or else crop injury is expected, e.g. 70% RH plus 90°F = 160 and would lead to injury.

The first corn on plastic row cover is starting to fill and some folks may begin harvesting next week. Very small stunted corn is being seen throughout MA due to dry weather and cold early on while the corn was still under plastic. While 6 inch cobs are considered USDA grade 1 or “fancy,” retail farm stand customers prefer 8 inch ears. Strawberries are wrapping up while cucumbers, spring broccoli and fennel are all being harvested now.

PEST ALERTS

Alliums: [Onion thrips](#) – adults and nymphs were at very high populations in onions scouted in Franklin and Norfolk Cos., MA where they have not yet been treated. Onions are particularly susceptible to yield reductions from thrips feeding as they are bulbing out, so now is a key time to target this pest. They also carry bacterial pathogens which can affect storage quality. A widely used threshold is 1-3 thrips per leaf.

Brassicas: [Imported cabbage worm](#) adults, eggs, larvae and now pupae, as well as [Diamondback moth](#) larvae and

cocoons, were seen at scouting locations around New England this week. Even though these lepidopteran pests are now widespread, they are mostly at low infestations except for one untreated field scouted in Franklin Co., MA on Brussel sprouts. Treat plants between the start of heading and harvest if 20% or more of the plants are infested (one or more caterpillars present). Use a 10-15% threshold throughout the season for kale, collards and mustard.

Location	GDD (base 50F)
Western, MA	
Ashfield	693.3
South Deerfield	804.8
Pittsfield	660
Central, MA	
Bolton	812.1
Northbridge	750.3
Phillipston	691.5
Eastern, MA	
Ipswich	680.6
Seekonk	879.1
Hollis, NH	774.7
Burlington, VT	852
Newport, RI	720.7

Also found this week in an untreated field in Hampshire Co., MA was a [cabbage looper](#) larva and [cross-striped cabbage worm](#) larvae and eggs—this is early for these pests. Use the same thresholds above for cabbage looper, but spray if 5% of plants are infested with cross-striped cabbage worm; unlike the other caterpillar pests on brassicas, eggs are laid in masses rather than singly, and when all those eggs hatch caterpillars can quickly skeletonize plants. [Flea beetle](#) a second flush of flea beetles has emerged in a Washington Co., RI field where they first reported flea beetle in mid-April. Pressure from flea beetles continues to be observed across the region and numbers were high in an untreated broccoli field in Hampshire Co., MA. When plants are young, an average of 1 beetle per plant or 10% average leaf damage is a reasonable threshold for chemical intervention.

Cucurbits: [Squash vine borer](#) adults are now being trapped in high numbers. Treatment threshold is 1 moth per week for organic growers, 5 moths per week for non-vining crops and 12 moths per week for vining crops.

Only make treatments based on scouting or trap captures since pressure varies greatly from field to field even in the same town. One trapping location in Hillsborough Co. NH captured 115 moths this week! The egg laying females are attracted to crops with a large canopy and thick stems. Late emerging *maxima* pumpkins are likely safe until the 5 leaf stage. [Squash bugs](#) and eggs were seen on summer squash in Norfolk Co., MA and Hillsborough Co., NH this week at low numbers.

Solonaceous: [Two-spotted spider mite](#) has not been confirmed anywhere, but look with a 10x hand lens in your high tunnel and field grown eggplant, peppers, tomatoes and strawberry crops for bronzing, mottling or speckled foliage and tiny, clear adults with 2 dark spots on their body. Under high pest pressure, webbing can cover the leaves. This hot dry weather is

Location	ECB	FAW	CEW	Spray Interval for CEW
Western, MA				
Sheffield	1	-	-	-
South Deerfield	0	2	-	-
Whately	0	0	-	-
Central, MA				
Bolton	4	-	-	-
Leominster	1	-	2	6
Eastern, MA				
Concord	1	0	0	No spray
Haverhill	0	0	0	No spray
Ipswich	0	0	0	No spray
Swansea	6		14	4
Tungsborough	1	0	0	No spray
NH				
Litchfield	0	0	0	No spray
Hollis	1	0	3	6
Mason	0	0	-	-
European corn borer (ECB), Fall armyworm (FAW), Corn earworm (CEW)				



Cross-striped cabbageworm feeding frenzy



Squash bug adult

conducive to spider mite flare-ups. Biological controls include preventative releases of the predatory mite, *Phytoseiulus persimilis* in greenhouses and fields and *Amblyseius fallicis* in greenhouses. [Potato virus Y \(PVY\)](#) was confirmed in Gold Rush potato in Norfolk Co., MA this week--this variety seems to be the worst affected this year. If this disease is diagnosed in your field at this point in the season, early vine kill, and harvest may save some tubers from getting the infection. See article this issue for more information.

The first generation of [Colorado potato beetle](#) is progressing; 4th instars and adults from the first generation were found in Franklin Co., MA even after treatment, and below threshold in Norfolk Co., MA after treatment. The treatment threshold for large larvae is 35 on 25 stalks scouted (~1.5 larvae per stalk), or 4 small larvae per stalk. Small larvae were also found above the treatment threshold on eggplant in Hampshire Co., MA.

Sweet Corn: [European corn borer](#) trap captures are low across the state (Table 1) as we have surpassed their peak flight at 631 GDD base 50F (Table 2). Feeding injury was seen at 15% in only one field scouted in NH. [Corn earworm](#) traps are up in fields where there is silking corn, and captures for this pest are also low due to lack of storm fronts bringing these migratory moths up the coast. Only one trapping location in MA is at a 4-day spray schedule for this pest. We may see more CEW with the rains coming tomorrow!

Multiple: [Potato leafhopper](#) nymphs and adults are now present on beans and potatoes across the region and on young apple trees in Hillsborough Co., NH. Scout now in potato, beans, and eggplant and treat at a threshold of 1 adult per stalk on potato or 1 adult per plant in beans, and 1.5 per leaf in eggplant. See article this issue for effective control strategies.

* When not given here, refer to the New [England Vegetable Management Guide](#) for scouting thresholds and treatment options.

POTATO LEAFHOPPER ACTIVE IN POTATO, EGGPLANT, BEANS

Potato leafhopper (PLH) adults have arrived and the first of the nymphs are now being observed across MA on potatoes, eggplant, and beans. Because low numbers of adults or nymphs cause injury and reduce yield, it is important to protect plants before adult numbers are high and before nymphs build up. Left uncontrolled, PLH populations will continue to grow rapidly. Plant injury and yield loss can be significant. In potato, yield loss occurs even before the development of obvious symptoms. Green beans are very susceptible, especially when they are infested prior to flowering.



Hopperburn symptoms on beans.

Identification. Adults are about 1/4 inch long, light yellow-green, and fly up from foliage when it is disturbed or shaken—they look like chartreuse sparks flying away from the plants. PLH overwinters in the southern US and the adults move north annually. Once adults arrive, lay eggs, and nymphs hatch after 10 days. Nymphs hang out on the underside of leaves; they are tiny, light green, wedge-shaped and very fast-moving. They tend to move sidewise, crab-like, on the bottom of the leaf. Presence of nymphs indicates an established population.

Damage. Adults and nymphs feed by inserting a needle-like beak into the plant and sucking out sap. They also inject a toxin into the plant, which causes yellowing, browning, and curling of leaves. In potato, leaf margins turn brown and brittle first, followed by death of entire leaves, a condition known as ‘hopperburn.’ In eggplant, leaf margins and tips turn yellow and curl up. Feeding can reduce yield before damage is visible. Damage can be severe on early-season and red varieties of potato, as well as in green beans, eggplant and raspberries. Long-season cultivars tend to be more tolerant (see table for resistant and more tolerant potato varieties). Beans are more susceptible when they are young than at later stages. Field crops such as alfalfa, clover, soybean, sunflower and tobacco are also hosts.

Scouting and thresholds. It is difficult to count adults since they fly quickly when foliage is shaken or disturbed. Sweep nets can be used to detect adults—treat if more than 1 adult is found per sweep. If you see one adult per plant when you shake the foliage, you are in that range. Once nymphs develop, they can be monitored by visually inspecting lower leaf surfaces on lower-canopy leaves. Treat if more than 15 nymphs are found per 50 leaves. Use a threshold of 1.5 leafhop-

pers per leaf in eggplant.

Conventional products. In potato and eggplant, some materials registered for Colorado potato beetle (CPB) adults will also control leafhopper, including neonicotinoid foliar sprays such as Admire Pro or Assail. These and several other carbamate, synthetic pyrethroid and organophosphate products are also registered for leafhopper in potato, eggplant and snap beans. Refer to the [New England Vegetable Management Guide](#) for registered products. While the classes of insecticides listed above generally have high toxicity to bees, there are variations within classes; for example, Assail (acetamiprid) has a lower toxicity to bees (rated as ‘medium’) while most neonics are rated as highly toxic to bees. Sivanto (flupyradifurone) is a new product in a novel class of chemistries, the butenolides, that works against sucking pests, including PLH. It is also labeled for CPB control. This new active ingredient is being touted as an alternative to neonicotinoids, and has been given a bee toxicity rating of Low.

Resistant	Tolerant	Susceptible
Elba: Very late, white	Green Mountain: Late, white	Superior
Kin Harry: Early, white	Snowden: Very late, white	Red Norland
	Ontario: Very late, white	
	Katahdin: Late, white	
	Marcy: Late, white	
	Keuka Gold: Medium-late, yellow	
	Red Maria: Late, red	

Organic products. PyGanic EC5.0 (Pyrethrin) has been shown to be the most effective product for reducing leafhopper numbers and damage. Good coverage is important, especially of the leaf underside where nymphs are found. Pyganic breaks down quickly in sunlight, so the residual period is short. Spraying late in the day or in the evening may provide better control than spraying early in the morning. Don’t wait for numbers to build up. Row cover can be used to delay PLH infestation in snap beans until flowering, when plants are less susceptible to damage. Using row cover is recommended on young eggplant, as it protects from flea beetles, CPB and PLH.

Pollinators and other beneficials. Although bees do not forage extensively in beans or potatoes, they may be active in the field when these crops or the weeds within the crop fields are flowering. During that time, selection of products with lower toxicity to bees is advised. Look for toxicity information on the label, and also in the New England Vegetable Management Guide ([Table 28](#), and in the products listed for each crop & pest).

For conservation of both native pollinators and honeybees, control weeds in the crop and avoid drift onto flowering borders or crops. However, encouraging some flowering areas in the margins is good for supporting pollinators before and after crops bloom. These can also be a nursery and refuge for beneficial predators and parasites of insect pests.

—UMass Extension Vegetable Program

POTATO VIRUS Y: A RE-EMERGING DISEASE OF POTATO AND TOBACCO

In recent years, growers have been reporting increased losses in potato and tobacco across the valley, the state, and the nation, due to Potato Virus Y (PVY). This year we have already confirmed PVY on several farms across the state, in several varieties of potato including Goldrush, Green Mountain, and Kennebec. PVY is an aphid-transmitted virus that affects many crops in the solanaceous family including potato, tobacco, tomato, and pepper, as well as many solanaceous weeds. PVY can cause 50-80% yield losses in heavily infected potato fields, and also causes reduced storage quality and post-harvest tuber death. PVY has been present throughout the US for decades causing little damage, but has recently re-emerged as a major threat to potato and tobacco production for several reasons including the development of new strains of the virus that cause tuber necrosis, widespread planting of varieties that show little or no PVY symptoms leading to undetected reservoirs of the pathogen, and contamination of seed stocks.

PVY Strains & Symptoms. For decades the PVY strain that was present in the US and Canada, known as PVY⁰ for ordinary, caused noticeable mosaic symptoms. Symptoms



Subtle mosaic symptomson foliage of Goldrush potato. Phot by S.B. Scheufele

of PVY^o on potato and tobacco may include leaf streaking, mottling, or mosaic, or in severe cases could cause leaf death, leaf drop and plant stunting. In tobacco, vein-banding or vein-clearing is common. Symptoms on potato vary by cultivar, with some varieties showing only mild foliar symptoms while others, especially Dark Red Norland and Yukon Gold, are extremely susceptible and show rugose mosaic symptoms (wrinkly deformation of leaves). Since the PVY^o strain caused noticeable symptoms on foliage, growers could rogue out infected plants visually, and levels of PVY in seed lots and crop damage and loss remained low. However, new varieties of potato have recently been released which do not show typical stunting and mosaic symptoms, and may exhibit no symptoms at all, but still carry the virus. These “carriers” contribute to the undetected spread of the disease through fields and seed lots. Varieties that serve as PVY carriers include: CalWhite, Gem Russet, GemStar Russet, Russet Norkotah, Shepody, and Silver-ton Russet.



Ringspots on tubers of Yukon Gold infected with the necrotic strain of PVY. Symptoms vary by variety and strain. Photo courtesy potatovirus.com

Furthermore, new strains of PVY have been making their way into the North American potato system which cause different symptoms, or no symptoms at all. PVY^N, the N standing for necrotic, causes severe necrosis on tobacco rendering it unmarketable, but only mild leaf mottle and necrosis on potato foliage, and therefore often goes undetected in potato fields and seed lots. There is evidence that the PVY^o and PVY^N strains have recombined to produce strains with some characteristics of both parents, and these are dubbed PVY^{N:O}. Another newly evolved strain causing a lot of damage to both potato and tobacco is PVY^{NTN}, which stands for a tuber necrotic variant of the PVY^N strain. This strain causes severe necrosis on tobacco foliage, mild foliar symptoms on potato, but causes necrotic flecking and ringspots on potato tubers, leading to severe losses in some varieties. Again, symptoms vary by cultivar with some showing mild or no symptoms while others, including Yukon Gold, exhibiting severe tuber necrosis.

Disease Cycle. Infected seed tubers are by far the most important source of PVY. Seed tubers are certified by state departments of agriculture to ensure little to no viruses is present. “Foundation” seed is the best grade and should have less than 0.55% total virus (including viruses other than just PVY) while “certified” seed may have anywhere from 0.56-5.0% total virus. Investing in foundation seed is the best way to keep PVY off your farm. Once the virus is present in a field it is transmitted mechanically or is vectored by aphids. Mechanical transmission occurs by movement of virus particles through plant sap via wounds caused by wind, workers, and equipment moving through the field.

Aphids are much more efficient at transmitting the virus and are considered the most important mode of disease spread. PVY is non-persistently transmitted, meaning that aphids can pick up virus particles on the tips of their mouthparts while probing or feeding in a matter of seconds and can spread the virus just as quickly to healthy plants—the virus does not have to move through the aphid vector at all as in persistently transmitted virus diseases. Since the virus is spread quickly through aphid probing, insecticides are not very useful in reducing spread of the virus by aphids, since some insecticides actually cause aphids to twitch and increase their probing activity. More than 50 species of aphids can spread PVY, including species which are not considered pests of potato or for which potato is not a preferred host. The most important aphid vectors in the Northeastern US are green peach aphid, potato aphid, bird cherry-oat aphid and soybean aphid.

Other solanaceous crops may harbor the disease without showing symptoms. This includes crops such as tomato and pepper as well as many weed hosts such as hairy nightshade. These asymptomatic carriers serve as reservoirs for PVY and contribute to undetected spread of the disease throughout the season, but luckily, true seed cannot be infested with PVY and so you don’t need to worry about the virus surviving between crops in weed seed.

Transmission of viruses occurs most easily in young plants, and the virus can more easily move throughout the plant when it is young. Furthermore, if young plants are infected the virus has more time to build-up within the plant and cause more severe symptoms or migrate to the tubers. Weather and other environmental conditions also influence the severity of PVY, and the expression of symptoms in different crops and cultivars.

Management

Use only certified disease free seed tubers. For many years seed certification programs were highly successful in maintaining low levels of PVY in seed stock, but the presence of new strains that show mild or no symptoms, the

widespread planting of symptomless “carrier” varieties, it has become harder to produce disease free seeds. However, seed certification programs do post-season testing which reliably detect the virus and classify seed lots as “foundation” or “certified”, meaning they harbor less than 0.55% total virus, or 0.56-50.% total virus, respectively..

Choose potato varieties carefully.

- Plant resistant varieties: Villeta Rose, Eva, Rio, Grande Russet, and Premier Russet
- Avoid planting symptomless varieties: Shepody, Silverton Russet, and Russet Norkotah

Reduce areas of bare soil around or within the crop. Aphids find plant tissue based on the color contrast between the foliage and the bare ground, so if there is no bare ground the aphid cannot “see” the crop.

Plant a barrier crop. Plant a border of non-host crop such as rye, sorghum, or wheat, several yards wide around your potato or tobacco planting. Migrating aphids will be more likely to land on the barrier, and when they probe the barrier crop to see if it is a suitable host their mouthparts will be effectively cleaned of virus particles. Remember not to leave any bare ground between the crop and the barrier.

Control solanaceous weeds. These include all of the nightshades which can be symptomless carriers of the virus, increasing disease severity and spread.

Rogue out affected plants. Infected plants will spread virus to their neighbors so walk the field and pull out any plants with signs of leaf mosaic or necrosis. Some of the new strains do not cause mosaic symptoms but some do, as does PVY^O, and losses in yield and storability can occur from any PVY strains. Volunteer potato plants that pop up in spring should always be rogued out, as these could be infected with PVY or other diseases such as late blight.

Aphid control. Since aphids spread PVY non-persistently, insecticides are often ineffective and are not considered a valuable control strategy. However, repellents such as horticultural oils (especially early on when aphid populations are low and plants are young) and newer behavior modifying pesticides may be of use, including: Assail, Belay, Admire Pro, Fulfill, Movento, Platinum.

Plant early and kill vines early. Aphid populations skyrocket in the late season, so planting early may allow you to get in more growth free of high densities of aphid feeding and potential disease spread. Growers may hesitate to kill vines too early because tuber size may be compromised, but if PVY is present, killing vines will prevent it from spreading to tubers causing total loss. Virus transmission from foliage to tuber takes 14-26 days depending on plant age.

If you have experienced PVY in your fields please get in touch with us so that we can begin to better document the extent of damage being caused in MA and so we can put you on a list of contacts for upcoming outreach events and workshops on PVY. Write us at umassvegetable@umext.umass.edu or call 413-577-3976.

--Susan B. Scheufele, UMass Extension

MEXICAN BEAN BEETLE: THE TIME FOR BIOLOGICAL CONTROL IS NOW!

If Mexican bean beetles have historically been a problem on your farm, you will very likely see them again this year, just about now. They may be pests on snap beans, lima beans, and, more recently, soybeans. While they are not a pest on every farm, some farms report significant damage from these pests and have to take action to prevent crop loss. Populations often build up when beans are grown close to the farm stand year after year, to be available for PYO customers or CSA members. Using biological control can reduce the need for insecticides.

Mexican bean beetle (MBB) adults are coppery brown with black spots. They look very much like large ladybeetles and in fact are closely related – but unlike lady beetles they feed on leaves, not other insects. Shortly after adults arrive in a bean field, they lay yellow-orange egg masses on the underside of bean leaves. These hatch into bright yellow, spiny, oval larvae, which feed, molt several times as they grow, and pupate on the underside of leaves. Feeding damage from adults and larvae can reduce yield and injure



Damage to bean foliage can reduce yield.

Pods if numbers are high. There are 2-3 generations per season, usually increasing in numbers with each generation.

Pediobius foveolatus is a commercially available biological control agent for MBB control and has a good track record in the mid-Atlantic states and among New England growers who have tried it. (*Pediobius* is pronounced “pee-dee-OH-bee-us”). It is mass-reared and sold by the New Jersey Dept of Agriculture and is also available from other beneficial insect suppliers. This small (1-3 mm), non-stinging parasitic wasp lays its eggs in MBB larvae. Wasp larvae feed inside the MBB larva, kill it, and pupate inside it, forming a brownish case or ‘mummy’. About 25 adult wasps emerge from one mummy. Adult wasps will emerge from mummies within 2-3 days of receipt. The parasitoids are shipped to farms as mummies or as adults.

Pediobius is suited to our succession-planted snap bean crops. The first bean planting serves as a ‘nurse crop’ to establish the population of *Pediobius* that will be hard at work in successive plantings all summer. Control continues and in fact gets better as the season progresses and successive generations of the wasp emerge and search out new bean beetle larvae. Planning 2-3 releases at 7-10 day intervals will help ensure good timing and coverage on several plantings. After a release in the first planting, it is advisable to leave that planting intact for a while, until the new generation of wasps has emerged from their mummies.

As with any biological control, make releases as soon as the pest is present, not after it has built up to damaging numbers. The New Jersey Dept of Agriculture Beneficial Insect Rearing Laboratory recommends two releases, two weeks in a row, coinciding with the beginning of Mexican bean beetle egg hatch. Wasps will lay their eggs in larvae of any size, but it is best to target the newly-hatched young MBB larvae. This will give control before damage has been done. Thus, timing is important. Watch for eggs and time the shipment for the first hatch of eggs into larvae. If in doubt about the timing of the hatch, release as soon as you see the eggs – if you wait for the larvae you may be playing catch-up. The release rate should be at least 2000 adult wasps per field for less than an acre, or 3,000 per acre for fields of one acre or more. Mummies are frequently shipped in screen bags. Simply secure to the underside of a bean plant. IPM Laboratories recommends 160 mummies/A, split between 2 releases for light infestations, 640 mummies/A, split between 2 releases for heavy infestations and for the home garden, a minimum of 10 - 15 mummies.

Integrating *Pediobius* with controls for potato leafhopper will be needed in many bean crops, and could have harmful effects especially on adult wasps. Avoid sprays shortly before or after releases; apply to a succession planting 5 days before release. Like beans, *Pediobius* wasps are killed by frost so annual releases are necessary. Most fungicides will not be harmful. Many insecticides will be harmful.

Plan ahead by contacting a supplier to inform them of your expected release dates and acreage. Contact information for New Jersey source: Tom Dorsey, 609-530-4192; address; NJDA, Phillip Alampi Insect Lab, State Police Drive, W. Trenton, NJ 08628. <http://nj.gov/agriculture/divisions/pi/prog/beneficialinsect.html>. You’ll also get advice on how to use the wasps from this office. *Pediobius* is also available from the following suppliers: Green Spot Ltd., NH., www.green-methods.com 603-942-8925; [IPM Laboratories](http://www.ipmlab.com), NY 315-497-2063; [Arbico Organics](http://www.arbico.com), 800 -827-2847 (AZ).



*Yellow egg clusters can be found now on lower leaf surfaces. Order *Pediobius* when you see them hatch! Adults look like coppery ladybeetles and feed lightly on leaf tissue. Photo by L. Nottingham.*



Yellow, spiked larvae do most of the damage.



Larvae infested by parasitic wasps turn brown and are called “mummies.”

-- Susan B. Scheufele, Amanda Brown, Ruth Hazzard

EVENTS

Conservation Biological Control Short Course

When: Monday, July 11th, 2016 from 9:00am to 4:30pm

Where: New England Wildflower Society Garden in the Woods Framingham, Massachusetts

This workshop will cover:

- The importance of beneficial insects - predators and parasitoids that attack insect pests.
- Overview of conservation biological control and integrated pest management (IPM).
- How to identify beneficial insects and distinguish them from other insects.
- How to recognize the habitat needs of beneficial insects and identify habitat deficiencies.
- The design and implementation of habitat improvements, including site preparation, insectary strip plantings, hedgerows, beetle banks, and more.
- The current best management practices that minimize land-use impacts on beneficial insects and mitigate exposure to insecticides.
- How to access USDA conservation programs for financial and technical support.

Participants will receive the Xerces Society's Conservation Biological Control Toolkit which includes habitat installation guidelines and other relevant publications, and the Xerces' book, [Farming with Native Beneficial Insects](#).

Instructor: Jarrod Fowler, Pollinator Conservation and Conservation Biological Control Specialist for New England and Northeast Regions at The Xerces Society and a Technical Service Provider at USDA-NRCS.

Continuing Education Credits Available *Certified Crop Advisor (6 CEUs) Pesticide Applicator Continuing Education (PACE) (5 CEUs)*

Cost: \$45 [Register by clicking here!](#)

How to Conduct an On-Farm Trial

When: Tuesday, July 12th, 2016 from 3:00pm to 5:00pm

Where: UMass Crop and Animal Research and Education Center, 89 River Rd. Deerfield, MA

Ever want to apply for a SARE farmer or partnership grant? Looking to improve your farming practices through research? This workshop is for you! Farmers and Agricultural Service Providers welcome. We will provide hands-on training in setting up a replicated field plot, and include practice taking measurements and collecting data. Concepts learned can help you answer many questions through on-farm trials, but this workshop will focus on the UMass trial “**Nitrogen contribution from cover crops for vegetable crop uptake**” being conducted on multiple farms in Massachusetts this fall as a way to prepare cooperating farmers to conduct this trial.

Stay tuned for a follow-up workshop on data analysis and interpretation of results.

Free, but please RSVP: <https://www.surveymonkey.com/r/OnFarmTrial>

Questions? Contact: Katie Campbell-Nelson, kcampbel@umass.edu, 413-545-1051

Supported in part by USDA/NE-SARE Professional Development MA State Program.

Cocktail Cover Crops: Trials and Techniques

When: Monday, July 25th, 2016 from 1:00pm to 5:00pm

Where: Many Hands Organic Farm, 411 Sheldon Rd Barre, MA

Multi-species cover crop cocktails can create synergistic ecological benefits for your farm or garden - enhancing biodiversity, efficiently capturing and recycling nutrients, and sequestering carbon in the soil. This workshop will explore how to select, mix, and establish various cover crop mixtures. We will also discuss assessment and quantifying how your cover crop practices are impacting soil health. **Instructors:** Ray Archuleta, NRCS Conservation Agronomist

Greensboro, NC; Brandon Smith, NRCS Northeast Region Team Leader for Soil Health Division; Masoud Hashemi Associate Professor UMass Stockbridge School of Agriculture; Julie Rawson NOFA/Mass executive director.

Cost: NOFA/Mass Member - \$38 (walk-in \$43) Non-member - \$50 (walk-in \$55)

Pre-registration is recommended. For more information contact Dan Bensonoff, Education Events Organizer, at dan@nofamass.org or 860-716-5122.

IPM Field Walks

In this series, learn to identify and scout for vegetable pests and select integrated pest management strategies that work for you, whether you are an experienced farmer, or just starting out, organically certified or not! We will use pheromone traps to monitor pests, use a microscope to identify plant pathogens, and learn to scout in multiple vegetable crops with UMass Extension Vegetable Program staff Katie Campbell-Nelson, and Plant Diagnostician Angie Madeiras. Scouting will be followed by a discussion of effective control strategies with growers in attendance. Bring a hand lens if you have one. *Supported in part by funding provided by USDA-NIFA Extension Implementation Program, Award No. 2014-70006-22579*

*** All field walks have been approved for 2 pesticide credits in the vegetable category*

July 19th, 4-6pm

Alprilla Farm, 94 John Wise Avenue, Essex, MA 01929

Farmer: Noah Kellerman

August 2nd, 4-6pm

Red Fire Farm, 184 Meadow Rd, Montague, MA 01351

Farmer: Ryan Voiland

Questions? Contact: Katie Campbell-Nelson, kcampbel@umass.edu, 413-545-1051

Twilight Meeting: Equipment for Mechanical Cultivation & Product Washing and Packing

When: Wednesday, August 10, 2016 from 4pm to 6pm

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

Tangerini's Farm is a 65-acre farm located in Millis, Ma. Produce is marketed through a 500 member CSA, an on-site farm stand, farmers' markets, food coops and wholesale buyers. Over the last two years, with support from an MDAR Food Safety Improvement Program grant, they have developed a washing and packing area to prepare all their produce. They will demonstrate the use of many pieces of equipment including wash tanks, barrel washer, bunch washer, onion topper and a conveyer system. They will discuss the flow of produce in the packing area as well as how it is stored. They will also show off some new investments and innovations in their cultivation equipment.

Lisa McKeag, from the UMass Vegetable Program, will also provide an update on the roll-out of the Food Safety Modernization Act (FSMA) in Massachusetts.

Contact Lisa McKeag at lmckeag@umext.umass.edu or 413-577-3976 for more information.

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

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