UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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In this issue:

Asparagus has hit farmstands, after a slow, stop-start spring! For reference, this photo of Tom Smiarowski (Smiarowski Farm and UMass Extension Crop Insurance/Risk Management Program) with part of a day's asparagus harvest, is from May 10, 2018. Photo: K. Campbell-Nelson

Crop conditions

The weather is starting to warm and brighten, but a few more cold nights have strawberry growers back out doing frost protection. Where sprinkling was possible, flowers do seem to have made it through all these frosty nights and we are all looking forward to a good strawberry season in a few more weeks! Asparagus has also been hit by the cold, as growth is directly tied to soil temperature, and frost can cause damage to spears leaving them soft and distorted. Now the crop is really starting to come in and it's a good thing because customers are snatching it up from the stands as quickly as it can be stocked! It's also been a little dry, and some fields are being irrigated before the forecasted warm and sunny weather. Potatoes are starting to pop and early sweet corn is plugging away now. Early tomatoes are almost ready to be planted out into the field, and cucurbits are also starting to go out. More crops are starting to come in now, with more variety of greens, bunches of radishes, and even some early carrots and bok choy rounding out online pre-order boxes—the new normal during COVID19. We learned so much from the grower-speakers at last night's twilight meeting on marketing adaptations, and were so impressed with everyone's resiliency and creativity! Hope many of you will tune in for next week's meeting on cleaning, sanitizing, and disinfecting around the farm. We are beginning to do a little on-farm scouting now, but still do not have the state-wide coverage we normally would at this time, so please continue to send us questions and pest alerts to umassveg@umass.edu, and see the article later this issue on how to take the best pictures possible so that we are better able to diagnose problems remotely. Here's hoping these next sunny days push crops along and folks can enjoy some good weed killing—get 'em while they're small!

Pest alerts

Brassicas

Flea beetles are out in force now. Make sure to protect susceptible crops like salad greens, bok choi, and tender seedlings so that they are not stunted by feeding damage. Chemical management options can be found in the brassica insect management section of the New England Vegetable Management Guide.

Imported cabbageworm butterflies are flying and eggs are being laid now. This is a native butterfly and is usually the first of four caterpillar species to begin chomping on brassicas. Time to start your regular scouting for this pest. Treat heading crops if 35% of plants are infested before head formation, or treat leafy greens and heading crops after head formation if 15% are infested. Control recommendations can

be found in the brassica insect management section of the New England Vegetable Management Guide.

Cabbage root maggot: We are past peak flight of cabbage root maggot flies, except in the Berkshires, where peak flight is forecasted to finish this weekend. That means eggs have been laid and may be hatching now. Watch for damage to transplanted crops—plants will wilt and die, leading to poor stands. In root crops, maggots create tunnels that can render turnips and radishes unmarketable. There are now several options for control in organic and conventional fields. See the brassica insect control section of the New England Vegetable Management Guide for details.

Sunburn on a tomato seedling. Photo: E. Drews

Various Crops

Wireworms have been observed causing damage in several specialty crops including Napa cabbage, fennel, and onion—they also typically cause problems in potatoes, sweet potatoes and many other crops. See article in this issue for more info and control options.

Sunburn is being widely reported on a variety of crops including tomatoes in greenhouses and high tunnels. Sunburn of foliage is not uncommon and occurs during cool, gray springs, either when foliage that had been shaded due to close plant spacing is suddenly exposed to direct sunlight when plants are spread out, or when there is a bright, sunny day after a long stretch of cloudy weather. The damage is spread across the plant with not much pattern to it (e.g. just the tips or just interveinal areas) and appears as light tan, gray, or white patches.

Fungus gnats are active in greenhouses now. For immediate chemical control of larvae in soil, azadiractin-based insecticides and the *Bt israelensis* products (e.g. Gnatrol) can be effective. Multiple applications may be required. Follow labels for application rates, intervals, and max # applications. Larvae can also be controlled with nematodes—*Steinermena feltiae* is the most effective species and is sold commercially as Scanmask or Nemattack. For control of adult gnats, predacious mites (*Hypoaspis miles*) can be used.

Garden springtails are being reported now on various crops including beets and Swiss chard in the field. These tiny, bounding insects usually spend their time in the soil or on the forest floor eating decaying leaves, fungi, and moss. On rare occasions, they will attack vegetables, greenhouse plants and mushrooms. They can be plentiful in the CT River Meadows because they like to inhabit the moist cracks that tend to develop in the silt soil as it dries out in the sun. Springtail feeding injury resembles that of flea beetles—many small holes in the leaves. Since springtails help in breaking down organic matter, they are usually considered beneficial insects, but can be controlled with pyrethrum (e.g. PyGanic) if they get out of hand.

Angular leaf spot of cucurbits, caused by Psuedomonas syringae *pv.* lachrymans*. Left: Note the yellow halo surrounding each spot in the early stage of the disease. Right: Vein-trapped, angular lesions that develop as the disease progresses. At this stage, this disease can look similar to cucurbit downy mildew. Photos: R.L. Wick*

BACTERIAL DISEASES OF VEGETABLE CROPS, PT. 1: LEAF SPOTS & BLIGHTS

Plant pathogenic bacteria can cause leaf spots and blights in many vegetable crops. These diseases are most often caused by species of *Pseudomonas* and *Xanthomonas* and tend to begin as small water-soaked spots that eventually turn brown. A yellow halo may or may not be present. In severe cases, spots can coalesce and destroy entire leaves. Because bacterial infection of the leaf tissue is limited by leaf veins, bacterial leaf spots are often angular in shape; however, this may not always be the case, and non-bacterial pathogens such as the downy mildews can also cause angular leaf spots.

Management of these diseases can be challenging, both in the greenhouse and in the field. They are best controlled by an integrated pest management (IPM) plan including elements such as crop sanitation, cultivar selection, and preventative ap-

plication of bactericides. It is also helpful to understand a few things about bacterial biology.

Bacterial leaf spot of pepper, caused by Xanthomonas campestris *pv.* vesicatoria*. Individual leaf spots are small but often coalesce into larger necrotic areas, as seen in the center leaf. Photo: R. L. Wick*

Most plant pathogenic bacteria are capable of growing at a wide range of temperatures, but they tend to thrive at slightly warmer temperatures than many fungi, and each has an optimum range in which disease development is most likely to occur. For instance, *Pseudomonas syringae* pv. *syringae*, which causes a leaf spot on solanaceous crops, is most active at 61-75°F (16-24°C), while the optimum temperature range for *Xanthomonas* species is 77-86°F (25-30°C). Although disease development may slow or even cease at temperatures well outside the optimum, infections may simply remain quiescent until environmental conditions once again become conducive to disease.

While bacteria may sometimes be present in aerosols and can be carried on the wind, they are generally not as easily moved about by air currents as fungal spores are. Bacterial transmission between plants is most commonly facilitated by splashing water (especially wind-driven rain and overhead irrigation) and human activity. Insects may also carry bacteria on their bodies or in their saliva. Unlike many fungi, bacteria cannot penetrate host tissue directly, but instead must enter through small wounds or natural openings such as stomata and hydathodes. Plant pathogenic bacteria require the presence of free moisture for several hours in order to cause infection, and so prolonged periods of high humidity and leaf wetness are highly conducive to disease development. Cultural management practices aimed at lowering humidity and leaf wetness duration are therefore critical for disease prevention. In the greenhouse, these practices include heating and ventilating and increasing horizontal air flow by using fans. In the field, use drip irrigation instead of overhead, and plant in areas of full sun, adequate soil drainage, and good air circulation. Proper plant spacing and weed management should be employed in both scenarios.

Black rot of brassicas, caused by Xanthomonas campestris *pv.* campestris*. This bacterium enters through the hydathodes along the leaf margins, causing characteristic V-shaped lesions. Photo: UMass Vegetable Program*

Start with clean seeds and transplants. A good IPM program involves starting with clean seeds and transplants. Like some fungal diseases, bacterial diseases can also be seed-borne. Hot water treatment can significantly reduce the number of bacterial cells present in seed. If pots or stakes must be re-used, they should be sanitized. Do not save seeds from infected plants. Grow resistant varieties when available. Some bacterial pathogens (e.g. *Xanthomonas campestris* pv. *vesicatoria*, which causes leaf spot of peppers) are comprised of several races, so keep in mind that resistant cultivars may not be resistant to all races. Current information on disease resistant vegetable cultivars may be found at vegetablemdonline.ppath.cornell.edu/Tables/TableList.htm.

Field sanitation. Most plant pathogenic bacteria do not survive more than a month or two on their own in the soil; however, they can survive for much longer inside of infected plant debris in the soil and may also persist in perennial weeds. Sanitation is therefore another important cultural practice for disease prevention and management. Remove infected plants and plant debris from the greenhouse or field. It is also advisable to remove healthy looking plants adjacent to symptomatic ones. In the field, plow deeply at the end of the season to bury remaining plant debris and speed its breakdown. In no-till systems, remove crop debris as thoroughly as possible and dispose of it off-site. Rotate away from host crops for at least two years. In addition to decreasing relative humidity, good weed management also removes alternative host plants.

Chemical control. Some fungicides containing copper, copper plus mancozeb, and phosphorus acids also have bactericidal activity and are labeled for use on vegetables. Organic products based on botanical oils, *Bacillus* species, and other ingredients may also be helpful. Trade name of products with those active ingredients can be found in Table 25 of the New England Vegetable Management Guide. Keep in mind, however, that the efficacy of these products is limited and there is no substitute for good crop management practices.

Tips for maximizing spray efficacy include the following:

- Obtain an accurate diagnosis. With the exception of those mentioned above, most fungicides have no effect on bacteria. Knowing that a disease is caused by a bacterium and not a fungus enables the grower to select an effective product to apply, potentially saving time, money, and unnecessary applications of agrichemicals.
- Be aware that none of these products can cure a plant that is already infected, but they can help prevent healthy plants from becoming infected; therefore, they are best used as protectants.
- Thorough coverage is imperative.
- Remove symptomatic plants and plant debris from the greenhouse or field as thoroughly as possible **before** spraying.
- Don't apply bactericides when plants are wet or use an air blast sprayer. The force of the air blast sprayer can spread drops of moisture containing bacteria among plants and at the same time cause small wounds through which infection can occur.
- Do not rely on copper alone for bacterial disease management. Copper-resistant strains of some plant pathogenic bacteria have been identified.
- Experimental evidence suggests that greater efficacy may be achieved when a plant defense activator like acibenzolar-s-methyl (e.g. Actigard) or extract of *Reynoutria* (e.g. Regalia) is included in the spray program.

--Written by Angela Madeiras, UMass Plant Disease Diagnostic Lab

How to take a photo for plant diagnostics

--Written By Elizabeth Buck, Cornell Cooperative Extension Vegetable Program. Originally published in the May 13, 2020 issue of Cornell Veg Edge

With the current push to work remotely, using pictures to quickly address production questions has a lot of appeal and utility. I love the idea of using grower-captured photos to hasten the trouble-shooting process, especially since it isn't always possible to make prompt farm visits. But in practice it can be quite tough to work out a problem using photos because of poor image quality.

High quality diagnostic photos absolutely can allow us (and other ag professionals) to make pretty confident IDs and assessments of what is going wrong. I frequently send diagnostic images to our plant pathologists for a preliminary read on the situation, it works great. Examples of high quality diagnostic images are regularly published in our pest/disease/weed management articles.

What makes a high quality image?

A high quality image has 3 key components:

1. The image matches exactly what you are seeing. Same colors, same level of detail.
2. The image is well focused on the intended subject (is "sharp").

Contact us:

Contact the UMass Extension Vegetable Program with your farm-related questions, any time of the year. We always do our best to respond to all inquiries.

Office phone: (413) 577-3976 *We are currently working remotely but checking these messages daily, so please leave us a message!*

Email: umassveg@umass.edu

Home Gardeners: Please contact the UMass GreenInfo Help Line with home gardening and homesteading questions, at greeninfo@umext.umass.edu.

UMass Extension services update:

As you are probably aware, operations at the University of Massachusetts Amherst have been significantly reduced in response to the COVID-19 pandemic. Currently, MA and University policy have the effect of temporarily suspending most of the on-campus services that we provide until further notice, including:

- Soil & Plant Nutrient Testing
- Plant Disease Diagnostics
- Hot Water Seed Treatment
- Nematode Analysis
- Weed, Insect, Turfgrass, and Invasive Plant Identification
- Public access to all farm properties

Until further notice, please do not send or deliver samples to campus, as we cannot process them.

3. The image captures the correct part of the field, plant, bug, etc to make an ID.

In practice, meeting these three criteria takes some time. I typically spend 3-5 minutes capturing a series of high quality images to use in VegEdge or to send off to our plant pathologists or entomologists. **Below you'll find tips on how to capture a good image, but first you should know some things.**

Need a close up shot of some mold? *Take photo through a hand lens. Left: Zoomed in image vaguely shows downy mildew sporulation on a brassica seedling. Left: By taking the image through a hand lens, greater detail including the separation of individual mold colonies and the structural shape of the sporulation can be seen. Note image is clear near the central leaf vein and blurry on the edges due to the effect of the hand lens.*

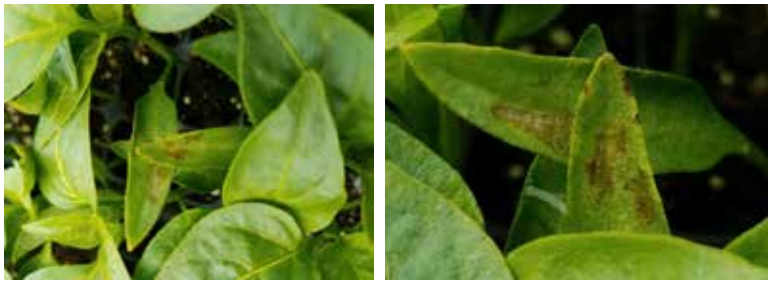
Things you should know:

Cameras sense a lot more light than our eyes can. Our eyes saturate with light and stop perceiving increased light well below the level of light that a camera (and plants) can perceive. This is why images taken in a sunny field tend to be over exposed and look washed out relative to what your eye perceives. The camera is showing you how much more light there is than you can physically realize. In a way, the camera is better than our eyes at showing us the relative amount of light a plant "sees".

Adjust the lighting setting. *Left: Overexposed image captured by just snapping a photo. Right: Same seedling, with white balance adjusted on phone so screen display matches what the eye sees; clearly shows the outline and wide range of discoloration (tan, bronze, yellow), which allows for a downy mildew diagnosis. The same diagnosis cannot be made from the image on the left.*

So much of diagnostics relies on picking out slight color differences in plant tissue. Sunglasses alter how colors look. Something that stands out well with sunglasses on may not be as distinct with them off. I cannot pick out the slight yellow checkerboard of early stage cucurbit downy mildew when I scout with my sunglasses on because my shades filter out light in a way that changes the appearance of yellow objects. Cameras don't filter light and color the same way as your sunglasses do. It is difficult to get the photo to capture exactly what someone wearing sunglasses perceives – far easier to take shades off.

Making an ID usually takes at several photos. This number changes based on the problem. Insects can be done in as little as 1 or 2 high quality pictures. Weeds and feeding damage on crops usually require 2-3 good images. Plant diseases and mystery problems are almost always 3-5 photos. Remember that disease symptoms can vary from the upper and lower sides of leaves and images of both can be helpful.



Correct focus point. *Left: Camera focused on leaves behind the scarring, leaving the lesion blurry and small. Too much extra foliage in the image. Right: Brought camera closer to subject, re-set the focus on the lesion, and stabilized the camera. These three actions yielded a sharper image that shows two different injury patterns – coppery sunken tissue in the center with no yellow margins and reddish-brown lesions with yellow margins moving in from the edge of the leaf.*

Different problems need different images:

- **For insects** you see, take a focused close-up of the pest. A couple images showing feeding damage, any frass, and where on the plant you're finding the damage can ID pests you don't see.
- **To ID caterpillars**, a top shot showing its head and a side shot of its pattern are really useful.
- **For broadleaf weeds**, take photos of the overall growth habit, a detail shot of some middle aged leaves, and one showing flowers or any other distinctive features like spines or rosettes.
- For **grasses**, a picture of the growth habit and a close-up, a focused image showing where the leaf meets the stem while you gently tug on the leaf blade will work well.

- **For diseases causing foliar symptoms**, include the overall plant, the portion of the plant showing symptoms but not yet fully destroyed, and a focused close up of the symptom. For example, with septoria of tomatoes I'd take pictures of a couple of staked plants showing that the problem is worst lower on the plant and that there is mud splashed up on the lower leaves. The next photo would be of a mid-aged leaf that is starting to yellow and is showing lesions. The last photo would be a close up of a mature lesion showing the surrounding tissue and a pale lesion with black specks in the center.
- For **diseases causing root symptoms, abiotic issues, or mysteries** take a picture of the field where the problem is occurring, a whole plant above-ground photo, pictures any above ground symptoms on the foliage, a shot of what the roots look like, and an image of the crown sliced open vertically. For example, if I'm diagnosing sad transplants, I'm taking a photo of the greenhouse area with bad flats, a picture of the condition of the flat showing the soil and tops of the healthy and affected plants, a close up a sad plant focused at the lower stem, and a shot of a sick seedling's roots.

Use the portrait mode, if you have it. *Left: Necrotic leaf is blurry while the background soil is in focus. Right: By using portrait mode, the downy mildew infected leaf becomes sharp and isolated from the background soil. The added sharpness reveals the darkening lines and veins in the chlorotic upper left part of the leaf, despite the right image being taken from a greater lens distance than the image on the left.*

Caterpillar ID. *Left: Blurry, curled up caterpillar, zoomed in on worm's side marking pattern. Center: Sharper view of same caterpillar taken by shifting camera angle, placing subject and camera lens in the shade of a ball cap to remove the shadow, and bringing the lens closer to avoid distortion caused by zooming. Right: Caterpillar glamour shot showing both top and side patterns, useful for ID.*

Steps for taking a high quality image:

- Clean off the lens of your camera before taking an image.
- Clean up the area around the subject. Push unwanted leaves out of the way, pull up weeds. This will help the camera isolate the subject from the background and improve the sharpness.
- Take off your sunglasses so you can match the image exactly to what you see.
- On bright days, hold your ball cap bill over the phone to shade the lens & reduce oversaturation.
- Stabilize the camera. Prop your elbow on your knee, ribs, the ground, stakes, etc.
- Center the focal point on the subject.
- Zooming in too far blurs an image. Better to adjust your distance from the subject first, then zoom so you maintain sharpness and level of detail.
- Adjust the lighting (white balance) of your image before taking the photo! This is the last thing you do before taking an image. Many phones have a little sun icon that you can slide higher or lower. Make the colors match what your eye sees.

Pro Tips:

- **Windy day?** Take leaves off plants, especially for shots of feeding damage and diseases. Place on any non-reflective surface like the ground, a truck seat, or even your pant leg.
- **Really tiny bug or something you saw with a hand lens?** Hold the scouting lens up to the camera lens. Move closer or further from the subject to take macro shots, don't zoom. The hand lens will distort the edges of the image, so make sure the subject is in the center.
- **Bugs moving around too much?** Catch them and toss them in the freezer over lunch. They'll be dead or very slow at the end of lunch and they'll still have all their original coloring.

- **Having trouble focusing sharply on the subject instead of the background?** Try using portrait mode on your phone. Or, put your hand directly behind the subject to obscure the background and refocus your image. Once it refocuses, remove your hand and quickly take the picture. This requires one-handed picture taking so be sure to stabilize the camera.

WIREWORMS IN VEGETABLE CROPS

Wireworm causes damage to vegetable crops including cabbage, corn, lettuce, pepper, potato and sweet potato, as well as field crops including field corn, sorghum, soybean, tobacco, and wheat. Wireworms are attracted to CO_2 released by germinating seeds, and can be a pest in large-seeded crops such as beans, peas and corn. Wireworms are the underground larval stage of click beetles, which are elongated, brown beetles that snap their bodies to make a clicking sound. Larvae are slender, yellow-brown, hard-shelled, and shiny, with three pairs of legs.

Left: Wireworm larvae. A less mature larva is visible at the bottom center of this photo. Right: Adult click beetle. Photos: G. Higgins.

Life Cycle: Corn wireworm is reported to be the most common wireworm species in the Northeast, but others may also be present including the tobacco wireworm, (*Conodoerus verspertinus*). Wireworm adults emerge from the soil in May and June, hiding during the day and flying at night. Each female can lay 200-400 eggs on the soil surface down to a depth of 6 inches, preferring grassy or weedy fields. Larvae hatch within 3-7 weeks and then spend 2-5 years in the soil before becoming adults. They feed on other insects, roots, seeds, tubers, and other plant tissue. Wireworms prefer wet soils and moderate temperatures (at least 70°F); they migrate upwards in soil to reach warmer, moist soils, and down to avoid excessive cold, heat, drought, or saturated soils.

Damage: Due to their long and variable lifecycles, infested fields will likely contain wireworms at all stages of their life, and the larvae begin feeding at 1-2 years old. Wireworm problems occur most often in fields that were forested, in hay, pasture or sod, had grassy weeds, were in grain production, or were planted with high residue grass cover crops (eg. sorghum-sudangrass or winter rye) within the past 3 years. Larvae feed on roots of many crops, where they can cause damage to growing seedlings or kill plants outright. Crops with starchy underground structures like potatoes can be rendered unmarketable due to tunneling caused by wireworms.

Avoidance and Control: Unfortunately, practices that enhance organic matter in the soil may actually worsen wireworm problems. The most important method of wireworm control is to avoid planting potatoes or other susceptible crops into infested fields. So, avoid fields with a long history of grasses. Rotating with buckwheat or brown mustard may help to reduce wireworm populations. In the spring, baits using corn, wheat or rolled oats placed 6 to 8 inches deep can be used to determine if wireworms are present, but this sampling method is labor intensive, and potatoes are often planted in early spring, before such samples could be completed. Cultivation in July-August can be effective in killing pupae, but not larvae or adults. There are varieties of potato (Cherry red, Yukon Gold, Maris Piper, Whitu, Alamo, Anco) and sweet potato (Ruddy and Charlseton Scarlet) that have some resistance to wireworm damage. Resistance may be due to high glycoalkaloid and low sugar content near the skin. In one university trial, Beauregard and Covington sweet potato cultivars were found to be highly susceptible.

A review of many insecticide trials over two decades indicated that organophosphate insecticides (Group 1B) applied as a pre-plant broadcast or in-furrow treatment gave better control than carbamates (Group 1A), and that the active ingredients fipronil (Group 2B) and bifrenthrin (Group 3A) were as effective as the organophosphates, but with less environmental impact and potential human safety concerns. Biological insecticides are available for the control of wireworm. The product PFR-97, containing the active ingredient *Isaria fumosorosea* Apopka Strain 97 is a fungal biocontrol that penetrates the wireworm larva cuticle and is labeled for soil applications on all outdoor grown crops. The product Majestene, containing heat-killed *Burkholderia* bacteria, is a bionematicide with a 2(ee) label for control of wireworm in potato and sweet potato. Both of these biological materials are OMRI certified for use in organic production.

Resources:

- Evaluation of Advanced Sweet potato Genotypes for Resistance to Soil Insect Pests, 2013. D. Michael Jackson and Howard F. Harrison USDA–ARS, U. S. Vegetable Laboratory, Charleston, SC.
- Wireworm Biology and Non-Chemical Management in Potato in the Pacific Northwest. N. Andrews, M. Ambrosino, G. Fisher, and S.I. Rondon; Oregon State University, PNW 607 December 2008.
- Wireworm Pest management in Potatoes. Thomas P. Kuhar, Hélène B. Doughty, John Speese III, and Sara Reiter; Department of Entomology, Virginia Tech, Eastern Shore AREC, 2009. Pub#: 2812-1026.

-- Written by the UMass Vegetable Program. Updated by Lisa McKeag, 2020

News

USDA Supports Specialty Crops Producers with Direct Payments for Losses Due to COVID-19

As part of the Coronavirus Farm Assistance Program, the U.S. Department of Agriculture (USDA) announced that it will provide up to $2.1 billion in direct payments to specialty crops producers. The payments will be based on losses where prices and market supply chains have been impacted and will help producers facing additional adjustment and marketing costs resulting from lost demand and short-term oversupply for the 2020 marketing year as a result of COVID-19.

Producers that fall into one of the following categories may be eligible to receive a direct payment:

- **Sales with a price loss of 5% or more between January 15 and April 15, 2020.** Almonds, artichokes, beans, broccoli, cabbage, carrots, cauliflower, sweet corn, cucumbers, eggplant, lemons, iceberg and Romaine lettuce, dry onions, peaches, pears, pecans, bell and other types of peppers, rhubarb, spinach, squash, strawberries and tomatoes are eligible.
- **Shipments that left the farm by April 15 and spoiled due to no market or for which no payment was received.** All specialty crops are eligible.
- **Shipments that have not left farm or mature crops that remained unharvested by April 15.** All specialty crops are eligible.

Beginning on May 26, 2020, producers of all eligible commodities may apply for assistance through their local USDA Farm Service Agency Service Center. For a list of local USDA FSA offices in MA, please visit this site: https://offices.sc.egov.usda.gov/locator/app?state=ma&agency=fsa. Specialty crops producers are encouraged to complete the application forms ahead of the application date. Producers can locate their service center and find application forms and additional information at farmers.gov/cfap.

Events

Mini-Twilight Meetings for Commercial Vegetable Growers

Join us each Wednesdays at 6pm for virtual mini-Twilight Meeting! Each week we will have a topic lined up for demonstration and discussion, with a presentation of new information on crop, pest, and farm management topics followed by plenty of time for Q&A about the topic at hand, and farmer-to-farmer discussion of the issues of the week. Farmers can join by phone or by computer—those who join by computer will be able to see some shared photos and presentations. This is a new program that we hope will allow us to connect with growers while we are not able to physically visit farms for routine scouting and assistance. It is intended for our commercial farmers and will cover topics relevant to small and large scale farm businesses and conventional and organic production systems.

How to join: Click here to register and receive the sign-in information.

Upcoming Topics:

- **May 27, 6pm: Cleaning, Sanitizing, & Disinfecting on the Farm in the Era of COVID-19**
  There are differences among cleaning, sanitizing, and disinfecting thta are important to understand in developing new protocols for your farm during the pandemic and in general for routine sanitation. We will cover the basic principles behind these terms and discuss what we know (and don't know) so far about how to apply

them on your farm this season.

- **June 10, 6pm: Greenhouse Fertigation with Judson Reid of Cornell Cooperative Extension**
  Greenhouse growing, whether for transplants, potted plants or those grown to maturity; requires precision management of pH and nutrient levels. How can we achieve a known level of parts per million of nitrogen? How much acid is required to achieve optimal irrigation water pH? Is this possible with organic or conventional inputs? In this workshop we'll do our best to explore these questions.
  1 pesticide recertification credit will be offered at this webinar.

Recordings of Past Calls:

April 22: Early-season pest scouting

April 29: COVID-19 business relief programs

May 6: Organic pest management

UMass Fruit ProgramWebinar: Overview of Spotted Wing Drosophila Monitoring & Management Options

When: Thursday, May 28, 2020, 12-1pm

How to join: Pre-registration is required. Space is limited to 500 participants. Register at: https://attendee.gotowebinar.com/register/4384169981708957199. After registering, you will receive a confirmation email containing information about joining the webinar.

Speaker: Dr. Jaime Pinero, UMass Stockbridge School of Agriculture and Extension Fruit Program

This presentation will provide an update on the most effective monitoring and Integrated Pest Management (including organic) methods to protect berry crops from spotted wing drosophila (SWD) injury.

1 contact hour for pesticide license categories 29, 35, 36 and applicators (core). For more information on how to get pesticide credits from this webinar, visit the event website.

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