UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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In this issue:

UMass Veg Team training NRCS staff in IPM principles at Cotyledon Farm in Leicester, MA.

Crop conditions

It's still hot and wet out there! MDAR reports that they have recorded 2700 acres and over $15 million in losses from extreme weather this year, between the February and May freezes and the excessive rain and flooding. Those are staggering numbers—we are wishing you all well and of course are here with any technical support that might be helpful. MDAR has set up a website with resources and information here. Check that site for information and updates on potential state-level disaster relief as things evolve.

A nice positive from all the rain is that garlic and onions seem to have sized up nicely. However, we've been seeing a lot more disease affecting everything—from Phytophthora blight in squash and melons, to Alternaria in brassicas and early blight in tomatoes, and bacterial leaf spot in peppers. Fields are still wet and muddy, making it hard to get in and spray, to fertilize yellowed crops, and also hard to plant on schedule—we are seeing transplants under stress since they should have been planted a few weeks ago, and in some cases it's too late to plant now and growers are wondering what cover crops they can plant now to overwinter. Here is some advice from our esteemed colleague from the north, Becky Maden of UVM Extension: "I have been recommending oats and peas for folks who can get in between now and the end of August. The sooner you can get anything planted (assuming soil conditions are dry enough), the better, to bring the soil back to life. Oats and peas are a good option if planted before the end of August, and they are relatively cheap too. Adding a third species to the mix could help even more, as a diverse blend of root structures and plant species will support a diverse group of soil microorganisms. Good options include crimson clover, vetch, mustard, or tillage radish (which can help with compaction and soil aeration)." Keep in touch about what you do try and what works well so that we can all learn from this experience, in the event that we find ourselves in this situation again in future years.

Next Thursday we will be at the SEMAP Twilight Meeting on Tight-Space Farming at Allendale Farm in Brookline, hope to see some of you there!

Pest alerts

Alliums

Onion thrips damage is high in some untreated fields. Last week we reported low thrips pressure in one field, possibly from the thrips being washed off by the rain, but clearly that is not the case across the board. Thrips cause direct feeding damage, and the wounds also allow for entry of bacterial pathogens that lead to bulb rots in storage. Therefore, onion crops with lots of thrips damage often do not store well. With crops almost ready for harvest, there is little to be

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 **Email:** umassveg@umass.edu

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

done about severe thrips infestations at this point.

Botrytis neck rot and **white rot** were both diagnosed in garlic this week. Both are fungal diseases that survive as sclerotia (hard masses of fungal tissue, surrounded by a black rind) in the soil or on cloves. *Botrytis* can also overwinter as mycelia on crop residue. In harvested garlic, you'll see the lumpy, black sclerotia of *Botrytis* around the neck and within the bulb; white rot sclerotia are small, black, and look like poppy seeds coating the surface of the bulb. Don't save infested seed.

Left: Garlic covered in poppyseed-like sclerotia of white rot. Photo: UMaine.

Right: Botrytis neck rot in garlic. The large black lump is a sclerotium. Photo: S. B. Johnson

Basil

Do you have downy mildew in your basil crop? Let us know, if so! We report this disease on a county-wide basis to let other growers know when to be on the lookout and start treating basil crops. Email us at umassveg@umass.edu or call us at 413-577-3976 if you suspect basil downy mildew on your farm or in your garden.

Basil downy mildew on the underside (left) and top side (right) of a basil leaf. Photos: A. Madeiras and Univ. of Florida

Brassicas

Alternaria leaf spot was confirmed on broccoli seedlings in a greenhouse in Hampshire Co. this week. This disease can be seedborne but is also common in the environment because of brassica crop residue in the soil and the many brassica weeds that are also hosts. Infected seedlings should not be planted out in the field. Alternaria can be controlled using fungicides if applied early and often. See the appropriate crop section of the New England Vegetable Management Guide for labeled materials. For organic growers, copper is the most effective material.

Celery

Celery anthracnose is developing now in some celery crops. This disease is also called celery leaf curl and causes leaves and stalks to twist and curl. The fungus also causes sunken lesions on the stalks, especially in the center of the plant and slimy brown rot of the center of the plant. Infected plants may be paler green than normal, but not yellow, and may be stunted. It is not well understood how celery anthracnose arrives on

Celery anthracnose. Photo: K. Campbell-Nelson

farms, but it spread by rain splash throughout the season. It is more common in warm, wet years. Varieties *Merengo*, *Hadrian*, *Geronimo*, and *Balada* have shown to be least susceptible. The common variety *Tango* is highly susceptible. Fungicides should be applied before disease starts for the most effective control. Strobilurin fungicides (Group 11) are most effective. See the article in the June 20, 2019 issue of Veg Notes for more information.

Cucurbits

Alternaria and **angular leaf spot** have been confirmed this week in MA. See article this issue for more.

Table 1. Squash vine borer trap captures for week ending July 26

Whately	0
Leominster	2
North Easton	-
Sharon	10
Westhampton	1

Phytophthora blight is continuing to be reported in cucurbits and peppers due to flooded and waterlogged fields. Symptoms in cucurbits are crown rot and plants collapsing, and/or soft circular lesions on fruit that develop white sporulation that looks like powdered sugar. Stems of infected pepper plants will turn brown, and plants will wilt, with rotting fruit remaining hanging on the plants. Infected cucurbit fruit will go on to produce sporangia with swimming zoospores that will move through saturated soil to find new fruit and plants to infect. If disease is just starting in a low spot of a field, tilling in the affected area and harrowing a border of healthy, unaffected plants may slow the spread. Get suspected infections definitively diagnosed at the UMass Plant Diagnostic Lab if you haven't confirmed *P. capsici* in that field in the past, so that you know what crops are safe to plant in that field going forward.

Downy mildew still has not been reported in MA but it has been observed in NH and NY so growers should be routinely applying protectant and targeted fungicides. Contact us (umassveg@umass.edu or 413-577-3976) if you suspect downy mildew in your cucurbits so that we can track this important disease!

Legumes

Anthracnose was confirmed in Worcester Co. this week in beans that were planted from saved seed. This disease can be seed-borne and this is an important way this disease spreads. The fungus that causes bean anthracnose can survive on crop residue for 5 years, so long crop rotations are important for managing this disease. There are resistant varieties available—see here. See the bean disease control section of the New England Vegetable Management Guide for labeled materials.

Sunken lesions of anthracnose on bean. Photo: S.B.Scheufele

Mexican bean beetle damage is high in untreated fields where adults and larvae are feeding on leaves and pods.

Solanaceous

Bacterial leaf spot is being widely reported in tomato and pepper. Bacterial leaf spot symptoms begin as small brown spots on foliage. Spots expand and coalesce and can cause significant defoliation, which then leads to sunscald of fruit. The bacteria can be carried on pepper seed and can survive in the soil on crop debris. Hot water seed treatment can eliminate the pathogen from seed. There are 11 identified races of bacterial leaf spot (0-10). There are resistant varieties; success using resistant varieties requires growing a variety with resistance to the race present in your crop, which requires identifying the race(s) present with lab testing. X10R™ varieties provide intermediate resistance to all strains. Chemical control is often ineffective.

Hornworms are active in tomato crops now. Hornworms usually do not warrant control in field tomatoes but can do significant damage in high tunnel crops. Bt materials are effective, as is hand picking. Let hornworms covered in white cocoons live—these are cocoons of a parasitic wasp. Move parasitized hornworms off of plants so that they don't do more damage while the wasps are developing within the caterpillar.

Hornworm in tomato. You'll often see their poop first, and then find the well-hidden caterpillar above. Photo: G. Higgins

Sweet Corn

European corn borer numbers have spiked in just 2 trapping locations, but trap captures are low across most of the state. GDDs indicate that the 2nd flight is occurring now or already over, depending on where you are, so 2nd generation caterpillars may be present in crops now.

Corn earworm trap captures are down from last week, with sites on 4- to 6-day spray schedules.

Fall armyworm is being caught in low numbers in some traps now. Some growers are also reporting FAW damage in whorl corn despite low or no trap captures. FAW larvae feed in whorl corn, causing ragged feeding damage and lots of sawdust-like frass.

Growers are reporting breakthroughs in control when using Warrior. This is not surprising since CEW resistance to Warrior is known and builds up over the course of the season, leaving only resistant individuals at this point. Baythroid XL is a good alternative to Warrior.

Table 2. Corn earworm spray intervals based on Heliothis trap moth captures

Moths per night	Moths per week	Spray interval
0 - 0.2	0 - 1.4	no spray
0.2 - 0.5	1.4 - 3.5	6 days
0.5 - 1	3.5 - 7	5 days
1 - 13	7 - 91	4 days
Over 13	Over 91	3 days

Table 3. Sweetcorn pest trap captures for week ending July 26

Location	GDD* (base 50°F)	ECB NY	ECB IA	FAW	CEW	CEW Spray Interval
Western MA						
Feeding Hills	1529	1	0	0	1	no spray
Southwick		0	0	0	2	6 days
Granby	1448	41	0	0	3	6 days
Whately	1525	0	0	0	3.5	5 days
Central MA						
Leominster	1555	22	0	-	12	4 days
Lancaster		1	0	0	4	5 days
North Grafton	1332	0	0	0	4	5 days
Spencer	1407	0	0	0	14	4 days
Eastern MA						
Bolton	1432	0	0	-	3.5	5 days
Concord	1410	2	0	0	5	5 days
Haverhill*	1457	0	0	0	8	4 days
Ipswich*	1358	0	0	0	10	4 days
Millis		7	0	n/a	12	4 days
North Easton	1488	2	0	0	3	6 days
Sharon		0	0	n/a	25	4 days
Sherborn	1481	0	0	0	3	6 days
Seekonk	1402	0	0	0	6	5 days
Swansea		0	0	2	18	4 days

- no numbers reported for this trap
N/A this site does not trap for this pest

*GDDs are reported from the nearest weather station to the trapping site

Leaf spots of cucurbits

Foliar diseases of all crops are running rampant at this point in this wet season. There are several diseases that cause leaf spots on cucurbit crops and they can often be hard to tell apart. Of course, a diagnosis from a trained pathologist in the lab is ideal, but we understand it is not always possible to test every spot you may encounter. Below are descriptions and photos of some the more common fungal and bacterial leaf spots found on cucurbit crops in MA that we hope will help you tease them apart in the field. Management practices for all of these diseases are similar—recommendations can be found at the end of the article.

Angular leaf spot can affect all cucurbits, but cucumbers are most commonly affected. It is caused by the bacterium *Pseudomonas syringae* pv. *lachrymans*. This disease is usually among the first of the foliar leaf spots to show up because it's seed-borne. In past years, we have received multiple reports of angular leaf spot on the same variety of cucurbit, all early in the season, indicating that the seed was infested. Bacteria proliferate in warm, moist weather and are spread from plant to plant during the season by splashing rain or runoff, as well as by insects or workers moving through the field. Small, round, water-soaked spots appear on leaf tissue, and expand until they are confined by veins, giving them the characteristic angular look. Under moist conditions, a milky white exudate containing bacterial cells may ooze out of the lesion on

the lower leaf surface. The wet-looking spots will dry out and turn yellow-brown or the dead tissue may fall out leaving a "shot-hole" appearance. Yellowing of the leaf between lesions may occur where disease severity is high. Similarly, water-soaked spots may appear on stems and petioles, drying out to form a whitish crust. Spots can also appear on fruit, where they begin as tiny and water-soaked, but dry to form whitish, chalky, spots, rendering the fruit unmarketable. The spots on fruit can also develop into internal fruit decay. Fruit that is infected early may be deformed. Affected plants will grow poorly and produce less fruit. Resistant varieties are available. If you catch angular leaf spot early, copper may be effective in reducing its spread.

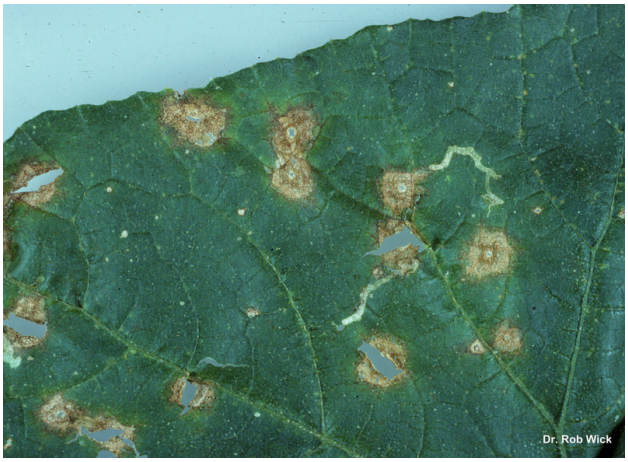
Angular leaf spot on zucchini. Spots will expand until they are trapped by leaf veins. Photo: S.B. Scheufele

Scab is caused by the fungus *Cladosporium cucumerinum* and can be a significant problem for summer and winter squash, pumpkin, melon, and watermelon. Lesions may occur on leaves, stems, petioles, and fruit, with fruit spots being the most damaging. Leaf spots are small, pale-yellow to white, and similarly to angular leaf spot, the dead tissue in the center of the lesion may fall out leaving a "shot-hole" appearance. Stem or fruit lesions may occur despite the absence of leaf lesions. Lesions on stems are elongate and light-colored, and if numerous may cause the internodes to shorten, giving the plant a deformed appearance. Scab lesions on fruit are sunken, irregular cavities with corky margins, and may produce a golden brown ooze, which dries into brown beads. Sporulation on lesions may occur, giving them an olive-green, felt-like appearance. This disease usually occurs in mid-summer and is favored by cool, dry days and rainy or dewy nights.

Scab on zucchini. Photo: T.A. Zitter

Tolerant varieties of cucumber are available. Chlorothalonil, mancozeb, or polyoxin D can be used preventively, at the first sign of disease.

Anthracnose affects mostly melons, watermelons, and cucumbers. Squash and pumpkins are less susceptible. The disease is caused by the fungus *Colletotrichum orbiculare*, which, like other anthracnose fungi, causes characteristic black, sunken lesions on affected fruit. Leaf spots are light-brown or reddish and appear near veins so may cause leaf distortion. These lesions dry out and the dead tissue may fall out, again leaving a "shot-hole" appearance. On stems and petioles, lesions are elongated and tan. Lesions on fruit are large, circular, sunken areas that turn black and may produce a pink ooze under humid or moist conditions. The fungus can be seed-borne and also survives on crop residue or volunteer plants (maybe in your compost or cull pile). Humid, rainy weather is necessary for disease to occur. There are three races of the fungus that affect different crops.



Shot-hole appearance of anthracnose on cucurbit leaves (Photo: R. L. Wick) and sunken anthracnose lesions on cucumber fruit (Photo: S. B. Scheufele)

Resistant cucumber and watermelon varieties are available, but there are not resistant cantaloupe varieties.

Alternaria leaf spot affects all cucurbit crops but is most common on cantaloupe. This disease is caused by the fungus *Alternaria cucumerina*. Like the *Alternaria* species that cause leaf spots in brassicas and early blight in nightshades, *A. cucumerina* causes a characteristic target-like spot. Usually, leaf spots are small and start out as tan flecks that enlarge and merge together. These larger spots (up to a half-inch) may exhibit the concentric rings common of all *Alternaria* fungi. This disease usually occurs in mid-season and can reduce late-season fruit production. Fruit lesions may also occur as sunken lesions with dark, olive-green, felt-like sporulation present in rings. Spores are spread from plant to plant via splashing rain or overhead irrigation, as well as by insects, workers, and equipment moving through the field.

Alternaria on canteloupe. Concentric rings make Alternaria leaf spots look like targets. Photo: G. Holmes

Septoria leaf spot is less common, occurring in cool summers or late fall. This disease is caused by the fungus *Septoria cucurbitacearum*, which causes small, almost white, round spots on leaves and superficial, raised tan bumps on fruit. Spores are spread from plant to plant via splashing rain or overhead irrigation, as well as by insects, workers, and equipment moving through the field.


Septoria leaf spot of cucumber. Photo: R. Wick

Management: The impacts of these bacterial and fungal diseases can all be reduced through field sanitation and use of preventative pesticides, whether conventional or organic.

- **Start with quality seed, and/or fungicide treated seed.** If saving your own seed, avoid collecting seed from fruit with any defects.
- **Resistant or tolerant varieties** of many cucurbit crops are available for most of these diseases. Meg McGrath of Cornell University has compiled extensive lists of disease-resistant varieties of vegetable crops.
- **Use a 2-year rotation** for cucurbit fields. All of these diseases survive on crop residue in the soil, which can persist for up to 2 years.
- **Use drip irrigation** to reduce the spread of bacteria and fungal spores by overhead irrigation.
- **Don't work in affected fields when foliage is wet**, or work in unaffected sections first and infected sections last to avoid spreading disease to unaffected areas.
- **Use fungicides or bactericides when you see the first leaf spots** to slow the spread of disease. Submit a sample to the UMass Plant Diagnostic Lab so that you can choose an effective pesticide for the disease you have. Consult the cucumber, muskmelon, and watermelon or pumpkin, squash, and gourds disease sections of the New England Vegetable Management Guide for pesticide recommendations.
- **Till under crop residues promptly** after harvest is complete to encourage the quick breakdown of infected tissues.

--Written by Susan B. Scheufele, UMass Extension

WHACKING WEEDS IN WET WEATHER

In crops that have persisted through this phenomenally wet season, weed control is becoming a big issue, with growers having trouble getting into their fields to cultivate or spray herbicides. When it comes to weed management, excess water is more of a problem than too little water. Here are some thoughts on tackling weeds under all this water.

Herbicides and cultivation: For those using preemergence herbicides, rain or overhead irrigation allows herbicides to be activated where weeds are germinating in the top few inches of soil. However, excess rain can move the herbicide below that zone, reducing control. When weeds emerge after the crop is up, there are a few options left. First, cultivate whenever it is dry and sunny; take advantage of those few days and don't delay. Weeds die better when they are small. Don't cultivate too deeply, as deep cultivation destroys crop roots and brings new weed seeds closer to the soil surface.

Second, check the New England Vegetable Management Guide for postemergence herbicide options for specific crops. Just about every crop has a postemergence grass herbicide option available. Depending on the crop, these products include Poast (sethoxydoim), Fusilade (fluazifop), Select (clethodim), Assure (quizalofop), and for sweet corn only, Accent Q (nicosulfuron). Grass herbicides work best on actively growing grasses BEFORE they flower and make seeds. Depending on the crop, broadleaf weed options may include nonselective herbicides (which work on all plants, including the crop) like Aim (carfentrazone) and Roundup (glyphosate), as well as more selective herbicides (which work on weeds and are safe on crops) like Stinger (clopyralid), Sandea (halosulfuron), and Impact (topramezone), among others. Some herbicides are labeled for use on the crop, while others are only labeled for use between rows. Make sure to read the label carefully before using any product. As with cultivation, small weeds die easier and faster than big weeds, so don't delay if you have a dry window. Herbicides are typically no longer an option after the weeds are taller than 6", and better control is achieved if they are between 1-3". If using an herbicide, always refer to the most recent product label (you can search for product labels here: https://www.cdms.net/Label-Database).

Hand weeding is always an option but take care not to drop those weeds back onto the soil where they might take root again after another rainstorm. Of course it's slightly slower, but consider using buckets or a wheel barrow to remove the weeds from the field. Prioritize removing weeds before they go to seed. Flowering galinsoga will produce seed if left in the field even after you pull it, so be careful to remove these from the field. When pulling weeds from the holes on plastic mulch, shake the weeds to remove excess soil and then place the weeds on the plastic where they're much more likely to die.

There are other options for managing weeds at this time of year—**mowing and burning**! The following is excerpted from the article When the Time Comes to Hand Pull Weeds, from the USDA-ARS Integrated Weed Management Resource Center:

Mowing: An option for late-season management is to mow the area of the field that contains a severe infestation. If the weeds have not yet produced seeds, this should substantially decrease the quantity of dropped seeds. The grower would need to weigh the cost of terminating the crop where the infestation exists, but should keep in mind that preventing this weed infestation now can save a substantial amount of money on weed control next year.

Burning: When faced with a severe mature infestation that has produced seeds, a grower may choose to not only mow the affected section of the field, but also burn the mowed weeds in piles or windrows. Burning this weedy plant matter at sufficiently high temperatures kills the weed seeds. Temperatures of 800-900°F are required to kill most weed seeds. In order to achieve this temperature range, it is important to form the plant matter in windrows or piles and then wait for it to dry, in order to create the density and dryness needed. Windrows may also be formed at harvest-time and then burned – this technique is referred to as "narrow windrow burning." It is becoming widely adopted in Australia, and is being tested by Virginia Tech and the University of Arkansas for use in US cropping systems. [Editor's note: narrow windrow burning has been found to be an effective technique for controlling herbicide-resistant weeds in field crop systems in University of Arkansas trials. This practice has not been trialed in vegetable crops or trialed specifically for controlling weeds during wet seasons. Obviously there may be roadblocks in wet weather with the need for the windrows to dry out before burning, but it's a practice that is not widely used in the Northeast that may have some potential with this unpredictable weather that is the new normal.]

While late-season control measures are labor-intensive, eliminating escaped weeds is an important measure for preventing seed dispersal and new infestations especially in no-till fields. Just a few plants can produce enough to infest an entire field in a couple of seasons. Manual removal this year could save significant money, time, and labor in future years.

--Written by Rich Bonanno, previous UMass Extension weed specialist. Updated by the UMass Extension Vegetable Program 2023.

IDENTIFYING CATERPILLARS IN SWEET CORN

We are at the point in the season when all the major caterpillar pests of corn are present in corn fields—European corn borer (ECB), corn earworm (CEW), and fall armyworm (FAW). We are seeing feeding damage from the second generation of ECB in the field now. CEW moths have been here for more than a month. Growers are reporting FAW damage now too, despite low or no trap captures.

If you are noticing unacceptable amounts of caterpillar damage in your sweet corn now, take the time to identify which corn pests are present. The most effective and efficient management strategy involves attracting and trapping moths using pheromones and using trap counts for each moth to inform spraying and/or scouting schedules. Earlier in the season, when ECB is the only caterpillar pest present, ECB trap captures tell us when the moth flight is beginning and therefore when to scout for caterpillars in the emerging tassels and early silks. ECB scouting results then tell growers if they are under or over a predetermined spray threshold. Once CEW arrives, the CEW trap captures determine the spray schedule: more moths caught per week mean fewer days between sprays. For more information on managing all 3 corn caterpillar pests, see the following articles in past *Vegetable Notes* issues:

Corn Earworm Management

Pheromone Trapping for Sweet Corn Caterpillar Pests

European corn borer is the first corn caterpillar pest to show up in sweet corn, as they overwinter in crop residues throughout the Northeast. ECB moths begin emerging in May (at 375 GDD base 50°F), mate, and lay eggs, which will hatch in 4 to 9 days, depending on the temperature. The newly hatched larvae will move to the closest protected feeding spot—whorl, tassel, ear—and will feed for 5 to 7 days before boring into the corn stem or ear. First generation larvae will pupate and emerge as adults at 1400 GDD (usually mid- to late-July) to mate and lay eggs. The second generation will overwinter as pupae, protected inside corn stems in the field. Historically, there have been 2 strains of ECB common in the Northeast, the New York strain (ECB-NY), and the Iowa strain (ECB-IA). ECB-NY usually arrives in New England before ECB-IA, and in greater numbers. In recent years, growers trapping for ECB have seen significant caterpillar damage in the field despite very low trap captures. NY and NH Extensions have deployed a hybrid ECB-NY/-IA lure to determine if this feeding damage is being caused by a hybrid of the two strains, but so far that does not seem to be the case and the low trap captures remain a mystery.

ECB eggs, adult, and caterpillar. Photos, clockwise from bottom left: J. Kalisch Univ. of Nebraska Lincoln; Clemson University, USDA, Bugwood.net; and D. Ferro

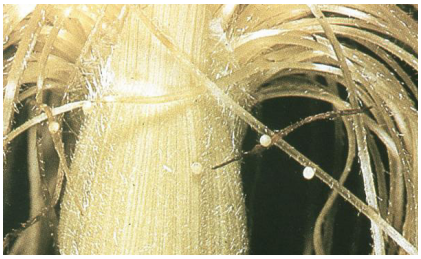
Adults are ¾ inch long moths, white to tan, with 2 dark, serrated lines running across the lower part of the forewings.

Eggs are laid in clusters on undersides of leaves—they are flat and overlap each other like fish scales. They are white when freshly laid, becoming cream-colored then orange-tan as they mature. Before hatching, the black head capsules of the enclosed larvae are visible.

Caterpillars vary in color from light-gray to pink but always have small, dark spots on each body segment. They have brown head capsules, and light red-brown stripes running the length of their bodies. Mature larvae are ¾ to 1 inch long.

Where might you see ECB? Before there is silk, caterpillars bore into the tassel or stalk. The weakened stalk will often flop over and you will see flagging tops in the field. Once there is silk in the field, ECB will enter the ears through the silk channel, or bore directly into the side of the ear. You may often see them in ripening corn boring into the side of the ear next to the corn stalk.

Corn earworm historically did not overwinter in New England and was instead blown in on storms coming from the south or from western New York where they overwinter, arriving in mid-July. In recent years, CEW is showing up earlier in the season, implying that there are pockets of overwintering populations of CEW in our region. Moths from overwintered CEW that are caught in pheromone traps will look "clean" and new, compared to moths that are blown up from the South which often look beat up and disheveled from their long journey. Eggs are small translucent globes laid in silks and are difficult to find. Eggs hatch in 2.5 to 6 days, and newly hatched larvae enter the ear through the silk channel and feed for 3 to 4 weeks before pupating. Although each female lays several eggs on each ear, you will only find one caterpillar per ear, as the small caterpillars are cannibalistic. Moths are blown in throughout the growing season, so spikes in trap captures followed by increased caterpillar damage are sometimes linked to storms. Additionally, a 2nd generation of moths can emerge to mate and lay eggs, adding to the constant presence of this pest throughout the summer.



CEW adult, eggs, and caterpillars, showing variation in color. Photos, clockwise from bottom left: B. Huchison, Univ. of Minnesota; R. Clark II; E. Burkness, UMN, Bugwood.org.

CEW (left) and FAW (right) head capsules. FAW head has an upside down y-shape. Photo: A. Eaton

Adults are yellow-brown moths, with a dark spot in the middle of each wing and a dark band across the bottom of each wing. Live or newly dead moths have light green eyes.

Eggs are tiny, white, and round. In the silk, they look like dew drops and are very hard to see.

Caterpillars vary in color, similarly to ECB, from green to pink to brown to nearly black. Alternating light and dark stripes run the length of their bodies, and they have sparse hairs covering their bodies. Each body segment has a group of 3 small dots on the side. The head capsules are always plain golden brown (compared to the head capsules of FAW, which have a Y pattern—see photo below).

Where would you be seeing CEW now? CEW are in ear tips—look for messy frass and/or chewed up silks.

Fall armyworm does not overwinter in the Northeast; moths are blown northward on storm fronts, usually starting in mid-July. CEW is also blown in on storms, though they don't always move together. Females prefer laying their eggs in whorl-stage corn. Eggs are laid on leaves and hatch in ~5 days. The larvae feed in the whorl and newly forming tassel, creating large, ragged holes in the leaves and dropping big clumps of frass. Larvae feed for 15 to 20 days.

FAW adult, eggs, and caterpillar. Photos, clockwise from bottom left: F. Peairs, Colorado State Univ., Bugwood.org; J. Castner, Univ. of Florida; C. Barrentine, BugGuide.net.

Adults are ¾-inch long, mottled dark gray moths, with some light spots on their wings and an obvious white area at the extreme tips of their wings.

Eggs are laid in masses on leaves and are surrounded by fuzzy hairs from the female moth.

Caterpillars are light-tan to dark black, with some longitudinal striping along their bodies. Their bodies are smooth, unlike the hairy CEW caterpillars. When viewed head on, FAW head capsules are divided by an inverted "Y", compared to the solid CEW head capsule.

Where would you be seeing FAW now? Check whorl-stage corn for large, ragged holes in the foliage, and big clumps

of frass in the whorl. Often, the FAW caterpillar will be within the developing tassel. FAW will also bore into the sides of ears, similarly to ECB, and can also infest ear tips.

References:

Fall Armyworm, Corn Earworm, and European Corn Borer Factsheets, New York State IPM Program

Using IPM in the Field: Sweet Corn Insect Management Field Scouting Guide, UMass Extension

--Written by Genevieve Higgins, UMass Extension

News

USDA Announces NEW Resilient Food Systems Infrastructure (RFSI) Grant Program

USDA has announced the Resilient Food System Infrastructure (RFSI) grant program, a program created to work with states and tribal governments across the US with the goal of developing and administering coordinated initiatives to build resilience across the middle-of-the-food-supply-chain within the states. MDAR will work in partnership with USDA to make competitive subawards to support infrastructure in the middle-of-the-supply-chain for domestic food and farm businesses and other eligible entities.

MDAR is soliciting feedback for RFSI funding priorities through an online survey, which can be found here.

For more information, please visit MDAR's Resilient Food Systems Infrastructure (RFSI) webpage. MDAR is currently in the planning process for this grant program. MDAR expects to release a Request for Response (RFR) for competitive Infrastructure Grant proposals in Fall 2023. More information will be provided including project requirements, allowable and unallowable costs, evaluation criteria, and project submission when the RFR is released. If you have any questions about the RFSI program, please contact Keri.Cornman@mass.gov.

Document Your Losses in the Massachusetts Freeze Event Impacts Survey!

The freeze events of February 3-4 and May 18, 2023, had significant impacts on agricultural sectors including tree fruits, berries, vegetables, ornamentals, and others. Now that losses are evident for most crops, UMass Extension and our partners* hope to generate timely reporting on losses at the state and regional levels. If you produce agricultural crops (including nursery stock) and you experienced crop losses due to the February 3-4 deep freeze and/or the May 18th freeze, please report them by filling out this survey. **SURVEY DEADLINE: July 31.**

This data will help document the extent of crop and economic losses and will inform the public and decision-makers who may be considering actions that would provide emergency funds to Massachusetts producers. Some growers may also receive insurance payments or be eligible for low-interest FSA loans or other USDA disaster programs. However, data from these programs will take many months to report, and may under-report losses in some sectors. Producers should also report losses to their local FSA office as soon as the extent of the damage can be assessed--this survey is not intended to take the place of reporting to FSA.

Your Data and Privacy will be protected. Please see details in the opening page of the survey and on the final page, where you may choose to provide and share contact information if you wish. No crop loss data at the individual farm level will be shared.

*Partners include: USDA Farm Services Agency, USDA Risk Management Agency, MA Department of Agricultural Resources, MA Farm Bureau Federation, MA Food System Collaborative, MA Fruit Growers' Association, New England Vegetable and Berry Growers Association, Community Involved in Sustaining Agriculture (CISA), Southeast MA Agricultural Partnership (SEMAP), and Berkshire Grown.

If you have questions about this survey, please contact cclay@umext.umass.edu.

Events

Twilight Meeting at Parlee Farms

When: Tuesday, August 15

Where: Parlee Farms, 95 Farwell Rd, Tyngsborough, MA 01879

Join UMass Extension to hear about pumpkin varieties grown at Parlee Farms, as well as sweet corn IPM and automated irrigation systems. 1 pesticide credit available.

South Deerfield Research Farm Field Day and Vegetable Twlight Meeting

When: Wednesday, August 16, 2:30-6 pm

Where: UMass Amherst Crop and Animal Research and Education Farm, 91 River Rd., South Deerfield, MA

Come hear about active research going on at the farm, including Vegetable Program trials on heat mitigation strategies, cucumber and basil downy mildew resistant varieties, sprayer technology, and more! We'll also have a presentation on automated irrigation systems from Toro. Up to 2 pesticide credits available.

The 38th Massachusetts Tomato Contest to be Held on August 22

When: Tuesday, August 22, 2023

Where: Boston Public Market, 100 Hanover St, Boston, MA 02108

Registration: Click here to register.

The 38th Massachusetts Tomato Contest will be held at the Boston Public Market on Tuesday, August 22nd. Tomatoes will be judged by a panel of experts on flavor, firmness/slicing quality, exterior color and shape. Always a lively and fun event, the day is designed to increase awareness of locally grown produce.

Open to commercial farmers in Massachusetts, growers can bring tomatoes to the market between 8:45 am and 10:45 am on August 22nd or drop their entries off with a registration form to one of the regional drop-off locations on Monday, August 21st. Drop off locations include sites in South Deerfield, Southboro, Dighton and West Newbury. These tomatoes will be brought to Boston on Tuesday.

For complete details, including drop off locations, contest criteria, and a registration form, click here. Be sure to include the registration form with all entries.

The 38th Tomato Contest is sponsored by the Massachusetts Department of Agricultural Resources, New England Vegetable and Berry Growers Association *and* Mass Farmers Markets *in cooperation with the* Boston Public Market. *Please consider participating to showcase one of the season's most anticipated crops!*

Questions? Please contact David Webber, David.Webber@mass.gov.

Twilight Meeting at Heart Beets Farm: Sweet potato production and fall pest management

When: Thursday, September 21, 4-6pm

Where: Heart Beets Farm, 181 Bayview Ave, Berkley, MA 02779

Join UMass Extension to hear about sweet potato production at Heart Beets Farm, and to learn timely info about fall pest management. 1.5 pesticide credits.

Eastern MA CRAFT Meeting: Geothermal Water Use and Good Agricultural Practices at Farmer Dave's

When: Saturday, October 21, 4-6pm

Where: Farmer Dave's, Dracut, MA

We will take a tour of their solar and geothermal systems and the reuse of the geothermal water for hoop house irrigation. Lisa McKeag from UMass Extension will share about a project the farm is involved in to assess pre- and post-harvest agricultural water quality for food safety. She'll talk about the results of water samples taken at the farm in 2022-23 and give an update on current food safety regulations related to agricultural water.

THANK YOU TO OUR 2023 SPONSORS!

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Vegetable Notes. Genevieve Higgins, Lisa McKeag, Maggie Ng, Susan Scheufele, Hannah Whitehead co-editors. All photos in this publication are credited to the UMass Extension Vegetable Program unless otherwise noted.

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