UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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In this issue:

Some farms got welcome rain this past week, while others watched the storms pass by from a distance. Photo: S. Scheufele

Crop conditions

Lots of planting going on! Hot season crops are in the ground in many places and covers are starting to come off of flowering cucurbits. Rains have been pretty well-timed in most of the state, punctuating the high-heat days just when it's needed to water in seeds and transplants, though it hasn't been quite enough. We talked to several farmers in eastern MA who've spent the last week hauling irrigation equipment around, and the US Drought Monitor shows that most of the state—everything except the westernmost counties—is either abnormally dry or in moderate drought.

Some growers are reporting that they're raising retail prices to make up for the increased cost of so many supplies, and so far they're still seeing good sales.

Our summer twilight meeting calendar is filling up. We'll be at Elliot Farm in Lakeville on June 15th and Harvest Farm in Whately on August 24th. Also later this month, on June 21st, the UMass Research Farm will host a program on soil health with demonstrations of several practices including no-till transplanting and using tarps for cover crop termination. See the Events section at the end of this issue for more details!

Pest alerts

Alliums

Allium leafminer was confirmed in Hampden Co. MA this week – this new pest has now been confirmed in Berkshire, Hampshire, and Hampden Cos. If you see thin, white tunneling along your allium leaves, or white larvae or brown pupae (both ~1/8" long) in your allium crops, let us know so that we can continue to track this new pest. The spring flight of ALM should be over now. Larvae and pupae will continue to develop in affected crops that have not been treated with insecticides. In younger crops that may have had eggs laid in them only within the last few weeks, systemic conventional insecticides may still be effective as they will kill the larvae feeding within the leaves. Insecticides without systemic behavior will not be effective on larvae.

Onion thrips numbers remain low in scouted fields this week. Populations can be expected to increase with hot, dry weather. Continue scouting, and treat if 1-3 thrips/leaf are found (organic growers should use the lower threshold).

Onion maggot: We are now between flights of onion maggot in most parts of the state, except for Berkshire Co., which is just past peak flight of the overwintered generation. There are several generations of onion maggot but the spring generation is the most damaging. There are no pesticides that are labeled for use after planting. Diazinon can be applied at planting, or transplants can be dunked into solutions of the beneficial nematode *Steinernema feltiae* prior to planting.

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.

Yellow tips on garlic leaves: This is a common thing to see this time of year in garlic. We're not totally sure the cause of yellow tips – some possibilities are garlic bulb mite infestations, which can be varying levels of damaging based on plant stress, nutrient deficiencies, drought or heat stress, or viral infections. So far, all evidence points to this symptom alone not being a huge concern in garlic. If you have yellowing garlic along with wrapper leaf tissue sloughing off of the stem or significant areas of poor emergence, there may be more concerning disease or insect issues in your crop – contact us at umassveg@umass.edu if you're seeing those more extreme symptoms.

Above: Diamondback moth larva causing "window-pane" leaf damage.
Below: Diamondback moth pupa.

Brassicas

Diamondback moth pupae were reported in Middlesex Co. this week. This means two (DBM and imported cabbageworm) of the four caterpillar pests of brassicas now active in the state. Historically, diamondback moth did not overwinter in the Northeast and did not appear until later in the season, but early sightings like this are leading us to suspect that they may be overwintering in some areas of the Northeast, or in high tunnels that stay warmer through the winter. DBM caterpillars are green with a forked tail; they will wriggle and drop on a thread of silk when disturbed (compared to imported cabbageworm larvae that are also solid green but slightly fuzzy and will not wriggle and drop). DMB caterpillars feed on leaves and often do not chew through the top-most layer of the leaf, leaving behind a thin "pane" of epidermal tissue. Some populations of DBM are resistant to carbamates (Group 1A, e.g. Lannate, Sevin, Vydate) and synthetic pyrethroids (Group 3), so do not rely on these groups alone to control this pest. Bt products (e.g. Dipel for organic growers, Xentari), neonicotinoids (e.g. Asana, Declare, Warrior, Mustang), and diamides (e.g. Exirel, Verimark) will effectively control DBM.

Chenopods

Leafminers are causing tunneling damage in beets, chard, and spinach across the state. In small plantings, larvae can be squished within leaves or affected leaves can be removed and destroyed. Translaminar conventional insecticides including spinosyns (e.g. Radiant, Blackhawk) and diamides (e.g. Coragen, Exirel) will be effective against larvae already inside the leaf. Blackhawk is labeled for beets only. If you have high leafminer pressure this year, rotating your future successions of chenopod crops far from the affected crop can reduce pressure in subsequent plantings.

Cucurbits

Striped cucumber beetles are continuing to feed in cucurbit crops across the state. Cover new cucurbit plantings as they go out into the field if they were not grown from treated seed and/or if you don't plan to treat. Kaolin clay can also be used to protect young seedlings. A spray is warranted in crops highly susceptible to bacterial wilt (cucumbers, cantaloupe) if there is 1 beetle/2 plants. In less susceptible crops, the spray threshold is 1-2 beetles/plant. Pyganic is the most effective OMRI-listed material – it is a contact insecticide that must hit the beetles to be effective. Labeled conventional products include carbamates, pyrethroids, and neonicotinoids – all are highly toxic to bees and should only be applied before flowers develop. The diamide product Harvanta is also effective and slightly lower risk to bees – trials from the University of Delaware found that it won't kill beetles at the same rate as neonicotinoids but will stop SCB feeding.

Solanaceous

Three-lined potato beetle is active now. Adults and larvae feed primarily on ground cherries, and less often on other more common solanaceous crops. Adults are ¼" long and striped black and yellow—they look similar to striped cucumber beetles. Larvae resemble Colorado potato beetle larvae and distinctively carry a pile of their own feces on their back. This pest does not usually warrant chemical control.

Three-lined potato beetle

European corn borer damage in a corn tassel. Photo: B. Phillips

Sweet corn

European corn borer: This was the first full week of trapping for ECB in MA. Low numbers of the NY strain are being reported across the state, indicating the beginning of the first flight. ECB caterpillars will bore into stems and feed within whorl-stage corn, as well as in the tassel as it develops. When ears begin to develop, caterpillars will move down to feed in ears. Sweet corn growers across the state monitor for ECB (and other corn pests, later in the season) using pheromone traps that attract male moths. In the case of ECB, the presence of moths in traps indicates that the moths are active and mating and growers should be scouting their corn for caterpillars. Scout by inspecting 50-100 plants, in groups of 5-20 plants throughout the field. Treat tasseling corn (because caterpillars will be protected from sprays in whorl-stage corn) if more than 15% of plants have 1 or more caterpillars present. Practice resistance management with pyrethroids (e.g. Mustang, Warrior) by mixing or rotating with a material from another class. Good options include carbamate (e.g. Lannate, will also control sap beetle), spinetoram (e.g. Radiant), spinosad (e.g. Blackhawk), or diamides (e.g. Coragen, Exirel).

Table 1. Sweet corn pest trap captures for week ending June 2

Location	GDDs* (base 50F)	ECB NY	ECB IA
Western MA			
Deerfield	418	17	1
Whately	435	1	0
Hatfield	403	0	0
Central MA			
Leominster	385	5	0
Eastern MA			
Millis	-	1	0
North Easton	420		
Sharon		0	0
Seekonk	456	4	0
Swansea			
Bolton	388	0	0

- 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. Some locations are not near a station and therefore GDDs are not reported.

Multiple Crops

Aphids were reported in high numbers on transplanted cucurbits under row cover on one farm in Middlesex Co. this week. In this scenario, the aphids likely originated on the transplants in the greenhouse. There are many natural enemies of aphids – ladybeetles, lacewings, parasitoid wasps – that usually will keep aphid populations in check once transplants are out in the field. However, row cover will exclude those beneficial insects, allowing the aphid population to explode. Scout covered crops when you remove covers to cultivate. Beneficials like ladybeetles can be purchased commercially and released under covers. Alternatively, the best OMRI-listed materials for aphids are insecticidal soap (e.g. M-Pede) and/or horticultural oil (e.g. Suffoil X, JMS Stylet Oil, many others); for conventional materials, use aphid-targeting materials to conserve natural enemies (e.g. Movento, Admire Pro, Fulfill, Beleaf, Assail).

Colorado potato beetle management

Colorado potato beetle (CPB) adults are actively moving into potato fields and laying eggs now. Increasing temperatures mean faster development and feeding rates. Cold, rainy weather slows both crop and insect growth, so eggs that are laid can pile up and then all hatch at once when it warms up. Knowing what to look for and getting out into the field to scout

is key in determining when to use appropriate controls. CPB is also an important pest of eggplant, so these fields should be monitored as well. Good control of CPB in June will not only protect vulnerable crops now; it will also reduce the number of beetles in the next generation that will survive to feed on next year's crops. Both adults and larvae cause feeding damage, but larval damage is the most severe. Because the fourth and final larval stage (fourth instar) does 85% of the feeding damage, it is critical to control larvae while they are small.

Colorado potato beetle adult laying eggs.

Life Cycle: In the Northeast, CPB feeds on solanaceous crops and weeds, including horsenettle, nightshade, eggplant, potato, and tomato (primarily seedlings). CPB overwinters in the adult stage, generally in soil (up to 12 inches deep) in the woods and brushy borders next to host crops, though some burrow into soil right in the field. In spring, the beetles emerge to search for host plants. Adult CPB are fairly slow and clumsy; they can fly, but more often they walk into fields from overwintering sites. Heavy feeding may occur on edges of non-rotated fields. If beetles do not find host plants via walking they will fly in search of food. Once they reach a host plant, adults feed, mate, and lay eggs. One female can lay up to 300 eggs in her lifetime. Eggs hatch in 7-10 days, depending on temperature. Feeding damage and larvae are easily seen on leaves. Larvae go through four molts (instars) before they pupate. In the first instar, the larvae are about the same size as the eggs and in the second instar they are about an eighth of an inch long. Mature, fourth instar larvae are hump-backed and plump, and reach 5/8"-long before they drop to the soil and pupate. Adults emerge from pupae after 10-14 days, leaving round exit holes at the soil surface. In southern New England there is a second generation of eggs, larvae, and adults in late-July, while in northern New England there is only one generation. Beetles fly or walk out of fields in August, seeking overwintering sites at field edges.

Monitoring & Thresholds:

- **Potato:** Scout every 3-4 days. Scout for beetles on 30 to 50 plants (or individual stalks later in the season). One recommended procedure is to walk the field in a V-shaped pattern and stop at 10 sites across the field. Randomize your selection of sites using a set number of paces, e.g. stop every 10 to 30 paces, depending on field size. At each location, select 3 to 5 plants (from when plants emerge until 12 to 18" tall); thereafter select 3 to 5 stalks at each site. Alternatively, select plants or stalks individually at random across the field. Count adults, large larvae (greater than half-grown), and small larvae (less than half-grown) separately. A spray is warranted if any of the following thresholds are met:
    - 0.5 adults, 4 small larvae, or 1.5 large larvae per plant (or per stalk once plants are larger than 18" tall
    - 10% defoliation

  Pay extra attention and be sure to scout again in 3-4 days if numbers are above 15 adults, 75 small larvae, or 30 large larvae per 50 plants/stalks.
- **Eggplant:** A similar process can be used in eggplant.
    - When plants are less than 6" tall: 2 small or 1 large larva per plant
    - When plants are more than 6" tall: 4 small or 2 large larvae per plant

There are no established thresholds for CPB in tomato, as it is not a preferred crop.

Use these scouting sheets to help keep track of beetle populations: Potato, Eggplant, Tomato. These can be used for several different insects and diseases in each crop.

Controls & Prevention:

Rotation. The single most important tactic for CPB management is to rotate potatoes, eggplants, and tomatoes to a field that is at least 200 yards from the previous year's fields. Barriers such as roads, rivers, woodlands, and fields with other crops are helpful, because CPB adults are such slow and clumsy movers. This single practice delays and reduces colonization by adults, and therefore reduces the number of eggs and larvae in the field later on.

Crop health. Starting with healthy seed and maintaining good crop nutrition help plants grow well and withstand feeding injury.

Barriers. Mechanical barriers such as trap crops, straw mulch, and trench traps may delay and reduce infestation.

Just-hatched colorado potato beetle larvae. Photo: K. Campbell-Nelson

- **Straw mulch.** It has been well documented that when potatoes or eggplants are mulched with straw, fewer CPB adults will settle on the plants and fewer eggs will be laid. This can be accomplished on larger plantings by planting into a rye cover crop, mowing down the rye, then pushing the rye straw over the plants after they emerge. For smaller plots, straw may be carried in.
- **Perimeter trap cropping.** Potato trap crops may be planted earlier than the main crop to attract beetles before the main crop emerges, or planted between overwintering sites and this season's crop. Flame, vacuum, or spray the border crop before beetles move into the main crop. Another approach is to plant three to five rows of potatoes treated with a systemic insecticide in a perimeter around the field; this treated border will kill up to 80% of the colonizing beetles. Planting main potato crops later than normal may also cause beetles to leave the field before potatoes emerge, resulting in lower beetle numbers.
- **Trenches.** A commonly made recommendation is to install plastic-lined trench traps next to overwintering sites at least one week before adults emerge, with trenches 1 to 2' deep and 6 to 24" wide at the top. They can be U- or V-shaped with side walls sloping at angles between 65° and 90°. Beetles walking from field borders fall into the trench and cannot fly out. The UMass Veg Team has never seen this tactic in practice. Let us know if you've ever tried it and if you've run into any pitfalls (maybe literally!).

Flaming. Flame weeders can be used to kill colonizing adult beetles in potatoes when the crop is less than 5" tall. Move rapidly using a tractor-mounted or hand-held flamer. The goal is to scorch beetles, not burn them to death, as injury to antennae and legs render them unable to orient and climb plants. At this early stage, healthy emerging potatoes have sufficient reserves to regrow foliage and establish well.

Biological control. Predators and parasites of CPB suppress populations and help prevent crop injury. Natural enemies that attack CPB eggs or larvae include twelve-spotted ladybeetle (*Coleomegilla maculata*), spined soldier bug (*Podisus maculiventris*), a carabid beetle (*Lebia grandis*), and a parasitic tachinid fly (*Myiopharus doryphorae*). The fungus *Beauvaria bassiana* (e.g. Mycotrol) has been shown to suppress beetle populations, though it does not provide immediate control. If insecticides will be used, use selective rather than broad-spectrum products to conserve natural enemies. Be aware that ladybeetle egg masses look very similar to CPB egg masses, though lady beetle eggs are slightly smaller (~1mm) than CPB eggs (~1.7 to 1.8mm) and more yellow in color, where CPB eggs are more orange.

Hand removal. For smaller plantings and early infestations, walking through the crop to squish egg masses or drop adults into buckets of soapy water can be very effective to delay the build-up of damaging populations.

Chemical Controls & Pesticides: Scout to determine whether or not a damaging population is present. When using products that control only larvae or only small larvae, scout for eggs, note egg hatch, and apply controls before larvae reach third instar to avoid the worst feeding injury. For materials that control all stages, you may wait and scout for adults and larvae to determine the need to apply insecticides.

- **Resistance management** must be part of every potato grower's plan. CPB has a remarkable capacity to develop resistance to insecticides. Based on a fifty-year track record, we can expect that any insecticide that is used repeatedly on the same population of CPB (that is, those in the same field or farm) will lose its efficacy in less than five years. Where potato production is concentrated and rotation has been limited, resistance may develop on a region-wide basis. It's up to you to manage resistance in the population of beetles on your farm and keeping insecticides effective with careful rotations is a worthwhile investment. In the New England Vegetable Management Guide, as well as on pesticide labels, each insecticide has a Group Number, which identifies chemistries with the same mode of action. Growers should note the resistance group number of each insecticide, rotate classes of insecticides, and avoid using the same chemistry more than once per year or even better, once every other year. **Do not use the same chemical class on successive generations in the same year.** Use newer chemistries first. For conventionally managed fields, there are enough different products to do a two-year rota-

tion that will effectively control CPB while effectively delaying resistance to any one product.

- **For organically managed fields,** the selection of insecticides is limited to fewer active ingredients including spinosad (Entrust), azadirachtin (Azatin), pyrethrin (Pyganic), and *Beauvaria bassiana* (Mycotrol O, Botanigard), which can be tank-mixed and/or rotated. The Bt product Trident that was recently developed against CPB is still off the market due to formulation issues. With few products to choose from, it's more important to time pesticide applications so that they are as effective as possible and therefore reduce the need for subsequent applications.

For current information on potato and eggplant insect management including up-to-date lists of insecticide groups that have products registered for Colorado potato beetle, please visit the New England Vegetable Management Guide potato and eggplant sections.

Do not try to kill every beetle in the field. Potato crops can withstand 15% defoliation without affecting yields. Avoid treating potatoes for CPB late in the season, as defoliation less than two weeks before senescence will have little effect on final tuber bulking.

--UMass Vegetable Extension

HIGH TUNNEL TOMATOES: FERTILITY & TISSUE TESTING

As summer days grow longer and warmer, high tunnel tomatoes grow steadily upwards, requiring weekly pruning, trellising, and other maintenance. As the plants continue to grow and fruit begins to ripen, the nutrient demand for calcium and potassium required to produce high quality, marketable fruit increases.

Many growers focus on calcium (Ca) at this stage in order to avoid blossom end rot later in the season. However, BER is more an imbalance of Ca within tomato plants themselves rather than lack of Ca availability, and more often than not, it is related to soil moisture fluctuation, heat stress, and sometimes, excessive nitrogen. Potassium (K) deficiency, on the other hand, in concert with excessive heat, can be an even greater problem for quality fruit production, resulting in blotchy ripening, yellow shoulders, and grey wall. Indeterminate varieties in tunnels and greenhouses continuously carry heavy loads of fruit, so potassium demand remains high from early-summer onward.

Soil testing - monitor available AND reserve soil nutrients.

Taking a high tunnel soil test in the early spring can help guide your soil amendment planning to sustain the heavy nutrient demands of high tunnel tomatoes. We recommend getting both a field soil test and a saturated media test for high tunnels.

A **field soil test** extracts reserve nutrients and reports the nutrient levels that will theoretically become available to plants as the season progresses. However, in the warm, well-watered high tunnel environment, tomato plants will start growing quickly immediately, so it's also important to know what nutrients are immediately available to those plants. This is measured using a **saturated media extract (SME) test**. Use both the field soil test and the SME to plan nutrient applications in the spring, and then take leaf tissue samples monthly to inform fertigation or side-dressing during the season (more information on tissue testing below).

A survey of 20 high tunnels conducted in 2018 in Massachusetts, New Hampshire, Rhode Island, and Vermont showed that both potassium and nitrogen are removed in large quantities by high tunnel tomatoes. As a result of this study, fertility recommendations for high tunnel tomatoes are now more closely correlated with expected crop yield. In other words, high-producing hybrid, indeterminate plants, which are in the ground for 6+ months (and may be grafted) have significantly higher nutrient demands than a June-planted, determinate tomato. Intuitively, the more biomass your plant is expected to accumulate, the greater the nutrient demands. Specific yield-based nutrient recommendations can be found in the High Tunnel Tomato section of the New England Vegetable Management Guide.

Tissue testing

Tissue testing is one way to understand what nutrients your plants are actually taking up from the soil before you see deficiency symptoms in your plant or even worse, on your fruit. Many tunnels need a mid-season boost of K through fertigation or top-dressing. Aiming for 3% K in the most recently matured leaves, by dry weight, is a good goal. Optimum tissue test values from the University of Delaware Extension for the most recently matured leaves at first flower

are listed in Table 1.

For conventional growers, soluble fertilizers with a K:N ratio of somewhere around 2:1 can help, according to research from Michigan. More N may be required for season-long production on indeterminate vines. For organic growers, you can top-dress sulfate of potash, as long as your irrigation moisture is able to reach it so it can dissolve, or it can be dissolved in hot water for fertigation.

Table 1. Optimum tissue test values for most recently matured tomato leaves at first flower. Source: University of DE Extension

Nitrogen (N)	2.8-4.0%
Phosphorus (P)	0.2-0.4%
Potassium (K)	2.5-4.0%
Calcium (Ca)	1.0-2.0%
Magnesium (Mg)	0.25-0.5%
Sulfur (S)	0.3-0.6%

How to take a tomato tissue sample: Tissue testing on a monthly basis, or even one or two times early in the season, can help take some of the guess work out of high tunnel growing and make sure that plants are taking up sufficient potassium, as well as other nutrients. At the very least, taking a sample at the onset of fruiting is a good time to ensure that nutrients are adjusted for a long and productive season. Here are the steps for taking an accurate tissue sample:

When sampling tomato leaves, take 3 leaflets from the tips of 30 leaves.

- Take the most expanded leaf below the first blooming flower cluster, which often is about 5 leaves down from the terminal. The 6th leaf is usually at a 90° angle to the stem (see diagram, above).
- Sample in the hour before or after noon (this is usually the peak uptake of nutrients for the day).
- Collect a representative sample of the planting from at least 15 plants of a single variety.
- If there is spray residue on the leaves, briefly rinse them with distilled water and pat dry.
- When sending to a lab, pack in paper bags, not plastic, so the material does not begin to rot.
- If you are trying to diagnose a nutrient deficiency on some of your plants, send samples of both "healthy looking" plants as well as afflicted ones.

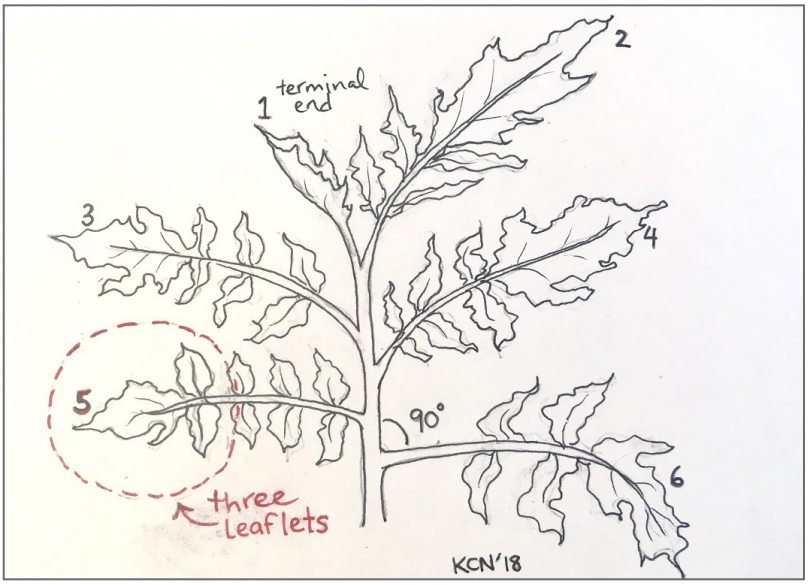

Diagram of which leaflets to collect for a tomato tissue sample. Figure: K. Campbell-Nelson

Preventing internal blossom end rot

Tunnel soils have likely warmed up quite a bit over the last couple weeks, but it's important to note that temperatures have a big effect on nutrient availability and uptake. Judson Reid from Cornell Cooperative Extension (see Cornell's *Veg Edge*, Vol. 18 Issue 6, May 11, 2022) notes that colder spring soils may restrict root growth and nutrient uptake and lead to internal blossom end rot (BER) on tomato fruit. While BER is common later in the season when there are high temperatures and low soil moisture, internal BER may happen early in the season when plant roots in cold soils are readily able to take up available nitrogen but calcium uptake is more restricted because limited roots are not able to access the calcium that may be attached to soil. This creates a localized calcium deficiency within the plant, and specifically the fruit, which leads to internal BER. A tissue test may show adequate calcium in the foliage while there is a deficiency in the fruit.

To prevent this, Judson suggests avoiding planting into soils below 60°F—plants may survive but won't thrive. If you do plant early, do not apply excess nitrogen—keep applications to 50% or less of the total N budget. Finally, don't inject excess levels of soluble N. Consider pre-plant applications before injecting and stay below 150 ppm N.

For soil-grown tomatoes Judson also recommends avoiding applications of additional calcium, such as calcium nitrate, since this will raise soil pH, and the persistent calcium will lead to other problems. For container-grown tomatoes, calcium nitrate may help prevent internal BER.

A few other practices that may help improve yield at this point in the season include:

- **Provide adequate soil moisture.** Install at least 2 drip lines per plant, up to 4 in sandy soil. Mulches may help keep moisture even across the soil surface.
- **Keep up with pruning.** Prune side shoots when small. Remove foliage to first cluster.
- **Track performance.** Measure harvests, even if simply counting boxes. This is key to assessing management changes.
- **Scout and manage pests**. Do not let challenging insects (like aphids) or diseases (like powdery mildew) get ahead of you. Set up a regular scouting schedule and get in touch with us (umassveg@umass.edu) for pest ID and management help. Scouting resources including a scouting form and tomato disease guide, are available here.

Additional resources:

- University of Delaware Tomato Commodity Recommendations
- Refining Tomato Nutrition for Improved Packouts – Steve Bogash, PennState

--Original article written by Katie Campbell-Nelson (formerly of the UMass Vegetable Program) and Becky Maden (University of Vermont Extension). Updated by L. McKeag for 2022.

EARLY SUMMER GARLIC CONSIDERATIONS

Now is the time when seed-borne insect and disease issues may become apparent in garlic crops. There are several issues that can cause poor stands, stunted plants or yellowed foliage that you might be seeing now or in the next few weeks. These include diseases such as basal rot (*Fusarium*), white rot (*Sclerotinia*), and occasionally *Botrytis*, stem and bloat nematode (*Ditylenchus dipsaci*), and even seed-borne insects like bulb mites (*Aceria tulipae* and *Rhyzoglypous* spp.). [For more information on garlic diseases and pests, see the Veg Notes Garlic Issue, from July 9, 2020!] At this stage, there is not much to do about these issues except rogue out affect plants and don't save seeds from affected fields. That said there is still lots to do to make sure you have the best possible garlic crop.

Poor stands of garlic and premature yellowing may be caused by a plethora of seed-borne diseases and insects.

The focus now is on making sure that the garlic plant that you have already grown is able to put all of its available energy into a strong, healthy bulb. Controlling weeds, maintaining adequate field moisture, and scaping will all help to maximize yield. Continued field culling will maximize quality, an especially important factor in seed garlic production.

Avoid Over-Fertilizing Garlic: Garlic will not respond with improved yield to applications of nitrogen after the summer solstice. These late applications of nitrogen could delay the normal maturity of garlic and may even aggravate some diseases. *2022 editor's addition: Research in 2017 and 2018 from Cornell Cooperative Extension showed that 50 lbs of N per acre in the spring, when garlic begins to grow, is sufficient to maximize yield. The same studies showed that garlic has taken up all of the N it will need by the end of May, and that seed clove size was actually more important than N availability for maximizing bulb sizes and yields.*

Weed control: Continue to control weeds in the garlic planting for at least the next few weeks. Weeds will compete for

moisture and will make it more difficult to harvest garlic. Most growers will want to complete at least one more cultivation pass on bare ground, and may need to hand-weed mulched beds.

Maintain Field Moisture: Garlic needs adequate moisture as it forms the bulb to maximize size. If you can, supply one inch of water per week to the garlic if we are not receiving rain. Plasticulture growers and those with heavy straw mulch should keep checking moisture levels under the mulch, though they may need to water less than bare ground growers. Keep watering until a couple weeks before harvest, as needed.

Scaping: Removing the scape may provide up to a 30% yield boost, depending on soil conditions and weed competition. If you can sell the scape to recoup the cost of labor used to remove it, even better! If you can't sell them, snap them and leave them in the field to speed up the process.

Field Culling: Continue to walk the garlic field and pull plants which are unusually wilted on warm, dry days; plants that are distorted or curled; and plants that are an off color (yellow or bright green, usually) and discard them. All of these plants will either have a physical defect such as feeding injury or may have a disease such as *Fusarium*. This is a particularly important step if you plan to save your garlic for seed or to sell it as seed. Even sickly garlic will often still make a small bulb. Once it is cured, a small bulb with disease issues can look remarkably like a healthy small bulb, though the disease inoculum is still present. Field culling is your best quality control option.

--Written by Crystal Stewart, Cornell University, Eastern New York Horticultural Program

News

UMass Extension Hiring Urban Agriculture Extension Educator - Apply Today!

UMass Extension is excited to add some dedicated capacity in the important and growing area of Urban Agriculture with the hire of an Extension Educator to be based in Eastern Massachusetts. We hope to develop a great pool of candidates who are capable of integrating well with others in Extension while developing and maintaining strong relationships with urban ag practitioners and organizations in Greater Boston and beyond. The application does not have an official closing date, but our goal is to **begin review of external candidates the week of June 13**.

Click here for more details about the position and to apply.

Homeowners & Landscapers: Be on the Alert for Hatching of Invasive Spotted Lanternfly Eggs

The Massachusetts Department of Agricultural Resources (MDAR) is asking the public to keep an eye out for the invasive pest known as spotted lanternfly (*Lycorma delicatula*) during the spring planting season due to the risk of egg masses being accidentally brought in on shipments of trees imported from other states. MDAR recently received reports that nursery stock from SLF-infested areas may have been sent to Massachusetts growers. Due to this, anyone who has recently purchased trees or shrubs or had them planted on their property, particularly maple or crabapple trees, is being asked to inspect the trunk and branches to ensure there are no SLF egg masses or any hitchhiking nymphs, and to report any finds to MDAR. Landscapers and plant nurseries are also being reminded to stay on the lookout for this pest.

SLF egg masses are about an inch and a half long, and are flat and gray in color, making them difficult to detect, especially on tree bark. Because of this, any SLF may not be noticed until the nymphs hatch at the end of May or the start of June. The public is asked to look for small black insects marked with white dots. If grapes or tree-of-heaven are in the area, they will migrate to those plants.

Spotted lanternfly is a sap-feeding insect that has caused significant impacts to vineyards, orchards, and other agricultural commodities in states where it has become established. SLF not only harms grapevines, maples, hops, blueberries, and over 100 other host plants, but has been observed to impact outdoor recreation in other states where populations are high and adult lanternflies swarm in large numbers during mating season. If you see any signs of spotted lanternfly, please report it to MDAR at https://massnrc.org/pests/slf.

MDAR's Climate Smart Agriculture Program Grant Now Open

MDAR is now accepting applications from agricultural operations who wish to participate in the Department's Environmental & Energy grant programs. Grants are available to help agricultural operations make farm improvements that enhance their economic viability while working to prevent negative impacts to environmental resource, adapting to and mitigating climate change, improving energy efficiency, and adopting renewable energy technologies.

The Climate Smart Agriculture Program (CSAP) links MDAR's water, energy and climate grants together into one application. This includes the Agricultural Climate Resiliency & Efficiencies (ACRE) Program, the Agricultural Environmental Enhancement Program (AEEP), and the Agricultural Energy Grant Program (ENER). This combined program continues the goals of the three individual grants by implementing projects that help the agricultural sector adapt to climate change, mitigate climate change, reducing or preventing impacts to natural resources that may result from agricultural practices, and that improve energy efficiency and facilitate adoption of alternative clean energy technologies. The CSAP grant is broken into two sections:

- Section I: Environment - for environmental projects such as soil health, water use efficiency, or other projects working towards reducing or limiting greenhouse gas emissions.
- Section II: Energy - Ag-Energy projects to improve energy efficiency or to facilitate clean energy adoption.

Applicants can apply to either, or both sections. Participants selected for funding under either section are provided with reimbursement grants for 80% of total project costs up to $50,000.

Applications due: 4:00 pm on Friday, June 10, 2022

Click here to visit the CSAP website.

For more information contact:
Section I: Environment - Laura Maul at 617-626-1739, Laura.Maul@mass.gov
Section II: Energy - Gerry Palano at 617-626-1706, Gerald.Palano@mass.gov

Applications Open for MDAR's HIP Vendor Notice of Opportunity & SNAP Equipment Grant

2022 Healthy Incentives Program (HIP) Notice of Opportunity (NOO): MDAR is now accepting applications to strategically onboard new agricultural vendors and access points for the Healthy Incentives Program.

- Application period: April 21 to June 8, 2022.
- Both new HIP-eligible vendors and existing HIP vendors may apply.
- To apply and read more information, visit: www.mass.gov/hipnoo
- Questions? Email DTA.HIP@mass.gov

SNAP Equipment Grant, Spring/Summer Application Round 2022: Free mobile SNAP processing equipment from Novo Dia Group is available to direct-marketing farms and farmers' markets through DTA, in collaboration with MDAR and with financial support from the United States Department of Agriculture (USDA).

- Application period: April 20 to September 23, 2022, or earlier if funds run out.
- Eligibility is limited to SNAP-authorized farms and farmers' markets that do not currently have working equipment received through previous federal grants.
- Applications will be evaluated on a rolling basis.
- To apply and read more info: www.mass.gov/snapequipmentgrant
- Questions? Email David.Webber@mass.gov

Additional resources

- Looking for SNAP processing equipment but not eligible for the SNAP equipment grant? Learn about other options here.
- Farmers and farmers market managers can learn more about accepting SNAP benefits on MDAR's website.
- Information on the Healthy Incentives Program can be found on the HIP website.
- One on one assistance with the SNAP retailer application is available through MarketLink.

Events

Save the Date! Twilight Meeting at Elliot farm

When: Wednesday, June 15, 2022, 4-6pm

Where: Elliot Farm, 202 Main St., Lakeville, MA 01247

Join SEMAP and the UMass Extension Vegetable Program on June 15 for a twilight meeting at Elliot Farm. Come hear about pest management and crop fertility topics—more information coming soon!

Soil Health Demos at the UMass Research Farm

When: Tuesday, June 21, 2022, 1-4:30pm

Where: UMass Crop & Livestock Research & Education Farm, 89 River Rd., South Deerfield, MA

Registration: Event is free, but registration is required. Register here.

Demonstrations will include:

- New York Soil Health Trailer demonstration
- No-till transplanting vegetables into a crimped cover crop
- Cover crop residue management
- Strategies for terminating cover crops: roller crimper, use of tarps, mowing

Save the Date! Twilight Meeting at Harvest Farm

When: Wednesday, August 24, 2022, 4-6pm

Where: Harvest Farm, 125 Long Plain Rd., South Deerfield, MA 01373

Join us at Harvest Farm in Whately/South Deerfield for a twilight meeting covering several post-harvest topics, including the vacuum cooler Harvest Farm recently purchased with a MA Food Security Infrastructure Grant. More information coming soon!

THANK YOU TO OUR 2022 SPONSORS!

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