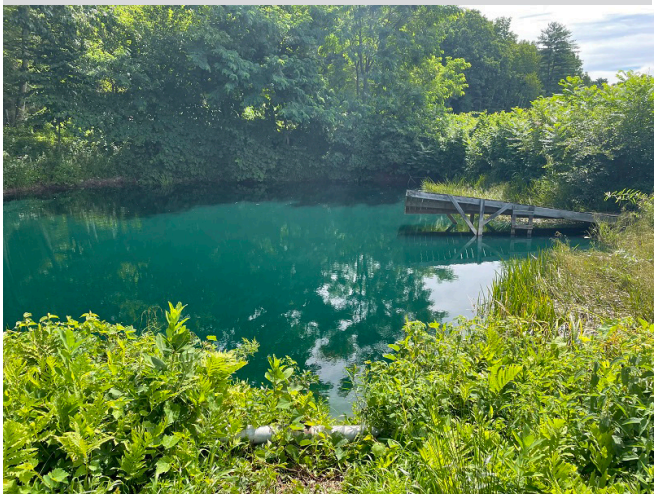
UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

Volume 34, Number 16 August 4, 2022

In this issue:



The grower that manages this irrigation pond uses blue pond dye and beneficial bacteria to reduce algal growth. Photo: L. McKeag

Crop conditions

Most of Massachusetts is under a heat advisory for the next couple of days, so be careful! There's lots of food to harvest out there, but if possible, limit the most strenuous activity to morning and evening, drink water, and take a dip or two in some water when you can!

The conditions of this summer—hot and dry—are especially conducive to the build-up of excessive algae in surface waters. While algae is normal and even beneficial (it contributes oxygen to the atmosphere), too much algae in farm ponds or reservoirs used for irrigation can clog irrigation equipment and contribute to the accumulation of muck that can trap plant and human pathogens. Algae are aquatic plants that need the same nutrients that crop plants do, so when nutrients—especially nitrogen and phosphorus, often from fertilizer applications or manure runoff—accumulate in the water, algae proliferate. The best ways to prevent problems from algae are to 1) prevent excessive growth by reducing the nutrients that run-off into the water from field applications, 2) create vegetative buffers around ponds to filter out nutrients, 3) avoid addition of leaves or grass clippings to water, and 4) aerate the water to increase oxygen levels and increase the levels of anaerobic bacteria that feed on organic matter and help reduce nutrients. There are also a variety of materials that can be added to ponds to prevent algae build-up, including pond dyes that block sunlight and reduce algae's ability to photosynthesize, and beneficial bacteria that compete with algae for food. Addition of barley straw to the water has been shown to be somewhat effective as well. Chemical algaecides are available for reducing algae levels once they've built up, but unless conditions change, populations will rebound. See this Purdue Extension fact sheet for more on managing algae in irrigation ponds.

Another important reason to pay attention to algae is that some species produce substances that can be toxic to humans and animals. Toxic algae may become dominant in stagnant water, especially during periods of drought and high temperatures. These Harmful Algal Blooms (HABs) made up of cyanobacteria (sometimes called blue-green algae) can make people and animals sick when they ingest or inhale affected water. Typically, cyanobacteria will look like a blue or green mat or scum on the surface of the water. If you see these concerning signs in your irrigation water sources, avoid contacting the water, don't allow pets or livestock to drink from it, and don't allow the water to directly contact the edible portions of food crops. Avoid using algaecides since the toxins are contained within algal cells and are released when cells die. The Massachusetts Department of Public Health provides more information on their Algae Blooms webpage about identifying harmful blooms, along with a list of waterbodies for which advisories have been issued. Here's a fact sheet on blue-green algae and irrigation water from Australia that has some general and applicable information for growers.

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.

Pest alerts

Alliums

Waxy breakdown in garlic was reported from a farm in Hampshire Co. this week. Waxy breakdown is a physiological condition caused by high temperatures at or near harvest time, or during storage. Low oxygen levels and inadequate ventilation during storage can also lead to waxy breakdown. Affected cloves will turn translucent yellow or amber over time and will develop a sticky, waxy consistency. Outer dry skins are not affected.

Waxy breakdown in garlic. Photo: M. T. McGrath

Brassicas

Cross-striped cabbageworm (CSCW) was seen in brassica crops in Hampden Co. this week. CSCW is usually the latest of the caterpillars in brassica crops to appear in New England. Unlike imported cabbageworm, cabbage looper, and diamondback moth, CSCW eggs are laid in clusters (they look like a patch of overlapping fish scales, usually on the underside of leaves). The resulting larvae cause ragged feeding damage in the foliage, and it's common to see a severely affected plant right next to a plant with no damage. Fewer materials are labeled for CSCW than for the other brassica caterpillar pests, but if you are spraying for the other caterpillars, you should also be controlling CSCW. Materials labeled specifically for CSCW include diamides (e.g. Coragen, Harvanta, Group 28), Proclaim (Group 6), Danitol (Group 3), Avaunt (Group 22), and Group 18 (e.g. Intrepid, Confirm). As for the other brassica caterpillars, the most effective OMRI-listed material is Bt (e.g. Dipel). Include a spreader-sticker to help materials adhere to waxy brassica leaves, unless prohibited by product label.

Cross-striped cabbageworm larva. Photo: T. Kuhar

Cross-striped cabbageworm damage

Chenopods

Phoma leaf spot was diagnosed on chard this week at a farm in Hampshire Co. Phoma leaf spot is a fungal disease that can affect Swiss chard and beets, and can also survive on lambsquarters. Lesions are tan, round to irregularly shaped, and develop concentric rings. If the pathogen moves into the crown of the plant, it can cause root rot both in the field and in storage. The pathogen usually arrives on farms on infested seed and can spread during the season by splashing water and equipment and workers moving through fields. We see Phoma much less frequently than Cer-

Phoma leaf spot on beets. Photo: Utah State University

cospora leaf spot, which is the most common foliar disease of chenopods. Till under infected crop residues promptly after harvest, and rotate out of chenopods for 3 years. Effective fungicides include Tilt/PropiMax, Miravis Prime, and Quadris. In limited Cornell Cooperative Extension trials, OMRI-listed fungicides have not shown strong control of Phoma.

Cucurbits

Squash vine borer larvae are tunneling within infested plants now and causing wilt and plant death. Look for a pile of sawdust-like frass at the base of a wilting, thick-stemmed cucurbit crop to distinguish between SVB damage and other diseases like bacterial wilt or Phytophthora crown rot. SVB can be monitored using pheromone traps (Table 1), and sprays can be timed based on trap counts. If you're interested in trapping for SVB next season, reach out to us at umassveg@umass.edu and we can help you get set up!

Table 1. Squash vine borer trap captures for week ending Aug 4

Whately	1
Leominster	3
Sharon	-
Southampton	0

Nightshades

Impatiens necrotic spot virus **(INSV)** was diagnosed on high tunnel tomatoes this week in Norfolk Co. Symptoms of INSV on tomato often appear as brown/gray spots or mottling on leaves, often starting at the midvein and moving outward. Brown necrotic spots can form on fruit. INSV is transmitted by thrips and commonly is transmitted to vegetable crops if vegetable transplants are grown in greenhouses alongside ornamentals. It's recommended to raise ornamental and vegetable crops in separate greenhouses for this reason, or to implement strict thrips control programs in shared greenhouses. Weeds can also be reservoirs for thrips and should be controlled in greenhouses and high tunnels.

INSV on tomato. Photo: T. Smith

Stemphylium leaf spot, also called **gray leaf spot**, was diagnosed on field tomatoes this week in Franklin Co. Until a few years ago, this disease was not commonly seen in the Northeast but was common on tomatoes in the southern US. Stemphylium is a fungal foliar disease of tomatoes, similar to early blight and Septoria leaf spot. Leaf spots caused by *Stemphylium* are irregularly shaped, with tan centers and gray edges, sometimes with visible gray sporulation at the center. Stemphylium leaf spot does not cause significant leaf yellowing, the way that early blight does. Early blight also usually begins in lower leaves and works upward, while Stemphylium leaf spot will appear up and down the plant at the same time. Conventional fungicides used to control early blight and *Septoria* should be effective against *Stemphylium* if applied at or before the first symptoms appear. The most effective OMRI-listed material is copper.

Stemphylium leaf spot in tomato. Photo: G. Higgins

Other fungal leaf spots of tomato, like **early blight** and **Septoria leaf spot** are also getting going, due to long overnight dew periods. See our Fungal Leaf Diseases of Tomato article for more information on these diseases, how to distinguish between them, and management recommendations.

Sweet corn

Corn earworm numbers are high in most parts of the state, with the exception of some locations in central MA. Lots of sites are on 4-day spray schedules. We saw high numbers come in late last week on storms. We are still amidst the 2nd flight of **European corn borer**, based on GDDs, and trap counts are up in some locations, but as is the norm over the past several years, trap counts are highly variable and not strikingly high. **Fall armyworm** is feeding in whorls now, but is

Sunburn in pepper. Photo: E. Ernest

likely being cleaned up by CEW sprays.

Various

Sunburn is being seen frequently in peppers, tomatoes, and cucumbers amidst this hot, dry weather. Sunburn appears as white, soft tissue on areas of the fruit that is not shaded by the foliage. Leaf drop due to disease, stunting, or plants tipping over will lead to more than usual sunburn, although some sunburn can occur even on the healthiest of plants. Often, sunburnt tissue will be colonized by *Alternaria alternata*, a fungus that infects only dead tissue, giving the tissue a black velvety look.

Table 2. Sweetcorn pest trap captures for week ending Aug 4

Location	GDD[1] (base 50°F)	ECB NY	ECB IA	FAW	CEW	CEW Spray Interval
Western MA						
Deerfield	1713	0	1	5	11	*4 days*
Feeding Hills	1774	4	1	1	1	*no spray*
Granby	1729	6	0	0	3	*6 days*
Whately	1767	6	3	0	11.5	*4 days*
Central MA						
Leominster	1693	2	0	0	20	*4 days*
North Grafton	1550	1	0	0	3	*6 days*
Sutton		4	0	0	5	*5 days*
Spencer	1631	1	0	0	1	*no spray*
Eastern MA						
Bolton	1705	4	0	0	3.5	*6 days*
Concord	1708	2	0	0	1	*no spray*
Haverhill*	1783	2	1	0	37	*4 days*
Ipswich*	1580	11	0	0	50	*4 days*
Littleton	-	11	0	0	0	*no spray*
Millis	-	7	3	n/a	3	*6 days*
North Easton	1734	-	-	-	37	*4 days*
Sharon		1	0	0	84	*4 days*
Sherborn	1755	8	0	0	9	*4 days*
Seekonk	1921	0	0	8	43	*4 days*
Swansea		1	0	-	4	*5 days*

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

[1]GDDs are reported from the nearest weather station to the trapping site
*Trap counts are from the previous week

IRRIGATING VEGETABLE CROPS

Plants need water to expand their cells and grow new cells, transport nutrients from the soil to the leaves, and maintain safe internal tissue temperatures through water evaporating out of stomata. When soil moisture content drops too low, plants will keep stomata closed to reduce water loss, which can lead to nutrient deficiencies and heat stress. Given the importance of water for all of the crucial functions, it's extremely stressful, for plants and farmers alike, when it's too dry – and we don't need to tell you that it's dry out there! Growers have spent the last month or more hoping for rain, and we're seeing crops failing and being abandoned due to lack of water and irrigation ponds and wells running dry. For those with access to sufficient water, managing irrigation often requires a huge amount of labor – setting up and moving pipes and sprinklers, refueling and turning on and off pumps, repairing burst drip lines. This article outlines specific crop water

requirements and factors that affect water loss from soils to help you make informed decisions about efficient water use.

Crop Requirements and Responses

Total water requirements over a season vary widely by crop, from about 6” of water per season for radishes to 24” for tomatoes and watermelons. Additionally, the critical irrigation period varies by crop.

Leafy vegetables often have relatively shallow roots and therefore benefit from even irrigation throughout their growth. For cabbage and lettuce, irrigation is most important from head formation through harvest, but overwatering or irregular watering during this period can result in burst heads. Broccoli and cauliflower behave similarly to heading leafy vegetables—drought stress in broccoli and cauliflower can lead to premature heading.

Root, tuber, and bulb vegetables: As these crops mature, water and carbohydrates are translocated from the leaves into the storage organs, causing the roots, tubers, or bulbs to “size up”. Therefore, the critical irrigation period for these crops is generally as the storage organ is enlarging. Uneven irrigation can lead to misshapen or split roots in carrots, second growth in potatoes, and early but small bulbs in onions.

Table 1. Critical Periods of Water Need by Crop

Crop	Critical Period
Asparagus	Brush
Beans, lima	Pollination and pod development
Beans, snap	Flowering and pod enlargement
Broccoli	Head development
Cabbage	Head development
Carrots	Root enlargement
Cauliflower	Head development
Corn	Silking and tasseling, ear development
Cucumbers	Flowering and fruit development
Eggplants	Flowering and fruit development
Greens Continuous	Lettuce Head development
Melons (muskmelons & watermelons)	Flowering and fruit development
Onions (dry)	Bulb enlargement
Peas	Seed enlargement and flowering
Peppers	Flowering and fruit developmen
Potatoes (white)	Tuber set and tuber enlargement
Potatoes (sweet)	Root enlargement
Radishes	Root enlargement
Spinach	Continuous
Squash (summer)	Bud development and flowering
Tomatoes	Early flowering, fruit set, and enlargement
Turnips	Root enlargement

Fruiting vegetables are most sensitive to drought stress at flowering and as fruits develop. For fruiting crops that are harvested only once (e.g. winter squash, sweet corn), irrigation can often be reduced as fruits reach maturity. Providing even water through the period of fruit enlargement can reduce the incidence of fruit cracking. For crops like tomatoes, peppers, summer squash, or zucchini, that fruit over a long period of time, it’s important to provide water throughout the fruiting period.

Plant growth stage also influences the susceptibility of crops to drought stress. Irrigation is especially useful when establishing newly seeded or transplanted crops. Irrigation after transplanting can significantly increase the plant survival rate, especially when soil moisture is marginal and the evapotranspiration rate is high. Irrigation can also increase the uniformity of emergence and final stand of seeded crops. For seeded crops, reduce the rate of application and the total amount of water applied to avoid crusting. If crusting is present, use low application rates and small amounts of irrigation water to soften the crust while seedlings are emerging. The periods of crop growth when an adequate supply of water is critical for high-quality vegetable production are shown in Table 1.

Factors Affecting Evapotranspiration

The crop water requirement, termed evapotranspiration, is equal to the quantity of water lost from the plant (transpiration) plus that lost from the soil by surface evaporation. Many factors affect evapotranspiration rates. The amount of solar radiation, which provides the energy to evaporate moisture from the soil and plant surfaces, is the major factor. Other environmental factors include day length, air temperature, wind speed, and humidity level. Crop characteristics, including canopy size and shape, leaf size, shape, and orientation, plant population, rooting depth, and stage of growth and development also affect the amount of water that will be pulled out of the soil, both by the plant and by evaporation from the soil surface.

Cultural practices, including cultivation, mulching, weed growth, and irrigation method, also influence evapotranspiration. Cultivation generally does not reduce evaporation significantly, but if crop roots are pruned by cultivating too close, water uptake and thus transpiration may be reduced. Shallow cultivation may help eliminate soil crusts and therefore improve water infiltration. However, soils managed with reduced- or no-till systems often have higher organic matter and improved soil structure than conventionally tilled soils, which leads to better water infiltration, less water runoff, and improved water-holding capacity. Weeds compete with the crop for water and increase the amount lost through transpiration. Sprinkler irrigation wets the entire crop area and thus results in a greater evaporation loss than does drip irrigation, which wets only the area in the immediate vicinity of the plants.

Table 2. Relationship of Available Water-Holding Capacity and Soil Texture

Soil Texture	Inches of Water Per Inch of Soil
Coarse sand	0.02 to 0.06
Fine sand	0.04 to 0.09
Loamy sand	0.06 to 0.12
Sandy loam	0.11 to 0.15
Fine sand loam	0.14 to 0.18
Loam and silt loam	0.17 to 0.23
Clay loam and silty clay loam	0.14 to 0.21
Silty clay and clay	0.13 to 0.

Soil factors must also be considered. Soils with high levels of silt, clay, and organic matter have greater water-holding capacities than do sandy soils or soils that are compacted (Table 2). It is estimated that for each percent of organic matter in the top 12" of soil, moisture-holding capacity is increased by about 16,500 gallons per acre. Soils with high water-holding capacities require less frequent irrigation than those with low water-holding capacities. However, when soils are irrigated less frequently, a greater amount of water must be applied per application to meet crop needs. Another soil factor that influences irrigation practices is the infiltration rate. Water should not be applied at a rate greater than the rate at which the soil can absorb it. Table 3 lists typical infiltration rates of several soils.

Table 3. Relationship of Soil Infiltration Rates and Texture

Soil Texture	Inch Per Hour Rate
Coarse sand	0.75 to 1.00
Fine sand	0.50 to 0.75
Fine sandy loam	0.35 to 0.50
Silt loam	0.25 to 0.40
Clay loam	0.10 to 0.30

Factors to Consider in Scheduling Irrigations

- Soils vary greatly in water-holding capacity and infiltration rate, as previously discussed. Sandy soils and soils with low organic matter will need to be irrigated more frequently than heavy clay soils or soils with higher organic matter content.
- Water loss from plants is much greater on clear, hot, windy days than on cool, overcast days. During periods of hot, dry weather, evapotranspiration rates may reach 0.35" per day or higher.
- If water is available for irrigation, it's better to maintain soil moisture levels in a narrow, ideal range than to let fields dry out and then apply a large amount of water.
- Plastic mulches reduce evaporation from the soil but also reduce the amount of water that can reach the root zone from rains. Thus, much of the natural precipitation should be ignored when scheduling irrigation for crops grown under plastic mulch.
- In general, for overhead irrigation apply 0.25" of water or more in each irrigation, except when establishing crops. When using drip irrigation and plastic mulch, applying as little as 0.08" of water per day may be sufficient during periods of low evapotranspiration.
- Use soil moisture sensors to evaluate soil moisture content and inform your decisions of when to irrigate. See Soil Moisture Sensors: A Tool for Smart Irrigation Management Decisions by UNH Extension's Jeremy Delisle for information on using soil moisture sensors.
- If you still have crops meant to go in the ground this season, you may already be considering reducing planting sizes or leaving them out altogether. We're also seeing growers having to abandon crops due to lack of water. While this is never an easy decision to make, when water is limiting, it can be better to consciously decide to focus the available water on high value crops or crops reaching their critical period of water requirements.

Sources

- *Commercial Vegetable Production Recommendations*. University of Delaware Cooperative Extension Service. 1993.
- *Irrigation of Crops in the Southeastern United States: Principles and Practice.* Publication ARM-S-9, US Department of Agriculture. May 1980.
- Drought Advisory: Vegetable Crops. EM4830. Washington State University Cooperative Extension.

--UMass Vegetable Program. Edited for 2022 by G. Higgins.

UNDERSTANDING WEED LIFE CYCLES: THE KEY TO BETTER MANAGEMENT

It's frustrating that this hot, dry weather stresses many crops, yet weeds seem to grow as vigorously as ever. When trying to figure out how to better manage weeds, it helps to understand why they are so darn successful in the first place. Weeds are plants that thrive in disturbed environments, like roadsides or annual vegetable systems that are repeatedly tilled. But all weeds are not created equal, and each species has its own lifestyle—when and why it germinates, where it thrives, and so on—which you can use to your advantage when it comes to managing them. Here we have broken them down into the following groups: summer annuals (small- or large-seeded broadleaves, and grasses), winter annuals, biennials, and perennials (stationary or wandering). Get to know your most problematic weeds and determine when and how you can get the most out of your weed control efforts.

We recently turned a version of this article into a fact sheet, which is available in both English and Spanish.

ANNUAL WEEDS

Annual weeds germinate from seeds and complete their life cycles within one year, while perennial weeds survive from year to year through underground storage structures from which they re-grow.

SUMMER ANNUALS germinate in spring and set seed during the growing season—some may have multiple generations per season. Many of our most common and troublesome vegetable weeds fall into this category, including crabgrasses, foxtails, pigweeds, lambsquarters, hairy galinsoga, velvetleaf, and purslane. Since the summer annuals are such a big and diverse group, it is helpful to further break them down:

- **Small-seeded broadleaf weeds** germinate when seeds are within the top 1 inch of soil. They grow very quickly and produce a huge amount of seeds (tens to hundreds of thousands), to improve the chances that some individuals will survive in a highly disturbed area. Because the seeds are small, seedlings of these species are very small and fragile, so it is important to take advantage of this vulnerability and control them at this stage.

  Examples: Pigweeds (*Amaranthus* spp.), lambsquarters (*Chenopodium album*), galinsoga (*Galinsoga ciliata*), smartweeds (*Polygonum* spp.), purslane (*Portulaca oleracea*)

- **Large-seeded broadleaf weeds** emerge from seeds buried between 0.5 and 2 inches deep in the soil. They grow rapidly and are more competitive than small-seeded annuals, since they have more energy stored up, have bigger leaves, and are more competitive with your crops. They produce fewer seeds (hundreds to thousands per plant) but seeds can survive for longer periods of time (decades).

  Examples: Velvetleaf (*Abutilon theophrasti*), giant ragweed (*Ambrosia trifida*), common cocklebur (*Xanthium strumarium*), morning glories (*Ipomea* spp.)

- **Summer annual grasses** emerge mostly from the top 0.5 to 1 inch of

Hairy galinsoga, a small-seeded summer annual. All photos courtesy of the UMass Weed Herbarium.

Velvetleaf, a large-seeded broadleaf weed.

soil. They produce a huge amount of seed and seeds are very long-lived. Abundance of summer annual grasses is associated with shallow or reduced tillage practices or compacted soils.

Examples: Foxtails (*Setaria* spp.), crabgrasses (*Digitaria* spp.), barnyardgrass (*Echinochloa crus-galli*), fall panicum (*Panicum dichotomiflorum*)

Yellow foxtail, a summer annual grass.

Field pepperweed, a winter annual producing flowering stalks in spring.

WINTER ANNUALS, in contrast, germinate in late-summer or fall and overwinter as small plants or rosettes. They resume growth in spring, and set seed in late-spring or summer. These weeds are most problematic in winter (think chickweed in overwintered greens!), in early spring crops, and in no-till systems.

Examples: Wild mustard (*Brassica kaber*), horseweed (*Conyza canadensis*), shepherd's purse (*Capsella bursa-pastoris*), field pepperweed (*Lepidium campestre*), henbit (*Lamium amplexicaule*), purple deadnettle (*Lamium purpureum*)

BIENNIAL WEEDS

Biennial weeds are propagated from seeds but generally take more than one full year to complete their life cycles. They grow vegetatively during the first growing season, overwinter as a root, then bolt and flower during the second season. They are very similar to winter annuals, but they can start growing earlier in the season of their first year so that they may live longer than one full calendar year. They are also similar to stationary perennials since they survive as a taproot.

Common teasel, a biennial weed, produces rosettes (left) in the first year and flowers (right) in the second year.

Examples: Wild carrot (*Daucus carota*), wild parsnip (*Pastinaca sativa*), common burdock (*Arctium minus*), bull thistle (*Cirsium vulgare*), common teasel (*Dipsacus fullonum*), white campion (*Silene alba*)

PERENNIAL WEEDS

Perennial weeds survive for multiple years from underground structures and can be stationary or wandering.

STATIONARY PERENNIALS are slow growing at first but later become very competitive. They reproduce by seeds, which they produce each year, and individuals survive for several years. These plants overwinter as large taproots in the case of broadleaf weeds like chicory, or large clumps of fibrous roots as in grasses like tall fescue. When the aboveground plant parts are killed through mowing, cultivation, or frost, the plant later regrows from these underground reserves.

Curly dock is a stationary perennial.

Examples: Curly and broadleaf docks (*Rumex crispus* and *R. obtusifolius*), chicory (*Cichorium intybus*), dandelion (*Taraxacum officinale*)

WANDERING PERENNIALS reproduce by seed but also by underground vegetative structures like rhizomes (root-like stems), stolons (creeping stems like strawberry runners), or tubers. Fragments of stolons or rhizomes can generate new individuals.

Examples: Johnsongrass (*Sorghum halapense*), quack grass (*Elytrigia repens*), yellow nutsedge (*Cyperus esculentus*), horsenettle (*Solanum carolinense*), milkweed (*Asclepias syriaca*), bindweeds (various), Canada thistle (*Cirsium arvense*)

Horsenettle is a wandering perennial which reproduces via underground rhizomes.

CONTROL STRATEGIES

- Kill any winter annuals present before planting using early tillage, with a plow, disc, hoe, or other cultivating tool.
- Delay planting until early-June to allow most seeds to germinate and be killed in preparing seedbed.
- Cultivate the top 1-2 inches of soil 2-4 times within the first month of planting to eliminate most summer annuals. Cultivating is most effective on hot sunny days since the disturbed weeds will be cooked in the sun. Going more deeply will bring more weed seeds up from the seedbank. Once the crop is big enough it will shade out later germinated weeds.
- Use mulches (paper, black fabric, straw, or plastic). Reduce weed density by hoeing or shallow cultivation before placing the mulch. Mulches are most effective for winter annuals, biennials, and small-seeded broadleaf weeds. They are less effective for large-seeded weeds or wandering perennials, since more energy is stored in the seed or root and emerging plants are bigger and stronger.
- Use transplants instead of direct seeding to give your crops a head start over the weeds.
- Hand weed to remove any weeds that have escaped cultivation, especially if they are about to make seeds. Prevent new seeds from entering the soil seedbank!
- Pay attention to ends of rows, between rows, or edges of plastic where there is no competition from crops and/or the soil is compacted.
- For perennials, frequent mowing, cutting, or tilling is effective as it will exhaust underground storage organs like rhizomes or tubers. This type of management is often necessary for several consecutive years in order to effectively control perrenial weeds.

--Written by Susan B. Scheufele, updated summer 2022

SKIN CANCER AND FARMERS

-- Written by Michelle Infante-Casella. Originally published in the Rutgers Cooperative Extension Plant & Pest Advisory, *July 25, 2022*

Skin cancer is the single most common cancer in the United States and the rising number of incidents is staggering: 5.4 cases in 3.3 million people in 2012, according to The Skin Cancer Foundation. More people are diagnosed with skin cancer each year than all other cancers combined.

Farmers, livestock producers and agriculture industry personnel are part of core skin cancer statistics related to outdoor work, consistently ranking highest in overall sun exposure. Farmers are in one of the most high-risk skin cancer categories. Most farmers work in direct sun often for seven days per week and at the sunniest times of the year.

Types of Skin Cancer

The three most typical skin cancers are basal cell carcinoma, squamous cell carcinoma and melanoma. Of the three, basal

cell is the most common and often found on the face, neck, ears, scalp, nose, and shoulders. Caught early, the cure rate is almost 100%. Basal rarely spreads and the risk of metastasis is less than 0.5%.

Squamous cell carcinoma (SCC) is the second most common type of skin cancer, and although relatively simple to cure when caught early, can be highly aggressive if unchecked. Over 1,000,000 SCC cases are diagnosed each year in the U.S., resulting in approximately 15,000 deaths. SCC can look like psoriasis and is an underestimated tumor. If left unchecked SCC can get into lymph nodes or other organs and cause death. SCC can be more aggressive than commonly thought. SCC is more common in persons with dark pigment skin, like those who tan easily, but darker skin doesn't mean you're protected.

Melanoma ranks as the rarest, but most serious form of skin cancer, causing 9,000 deaths per year. It is typically highly aggressive and can pop up anywhere on the body, even on areas with no sun exposure: palms, soles, genitalia, eyes, navel, or inside the mouth.

As with any cancer, early detection increases survival rate. The earlier you catch melanoma, the shallower it will be on the skin's surface. Generally, a thin melanoma kills 2% to 5% of people, but the numbers go to 80% of people dying for a deep melanoma.

What does melanoma skin cancer typically look like? It may look like an asymmetrical dark spot, usually larger than 6 mm diameter with jagged borders, color variation, and changes in appearance. A five-letter (A-E) framework provides a general melanoma description. A = asymmetry; B = border irregularity; C = color variation; D = diameter over 6mm; and E = evolution or change.

Keep in mind, there are melanoma that don't fit that pattern. You can have spots that don't correspond to the chart and still be melanoma. If you've got a new mole that's changing and catches your eye, just get it checked.

Preventative Measures:

Wear Light-Colored Clothing

Since farmers spend a great deal of time working outdoors, it's important for them to understand the many ways to protect their skin so that they can reduce their chances of developing skin cancer. Clothing protection is most important in protecting the skin.

Hats can protect the most vulnerable head and neck areas from the sun's rays. While baseball-type caps will protect the top of the head, they don't protect other important areas including the ears, nose, and neck. Farmers should wear wide-brimmed hats. The recommendation is to wear a hat that has at least a 4-inch brim. Long-sleeved shirts and long pants can help to protect the arms and legs.

Wearing tightly woven lightweight and light-colored fabric can keep the body cooler in the sun and will protect against cancer-causing rays. There are many companies that manufacture high-quality sun-protective clothing.

Choose Waterproof Sunscreen – Even on Cloudy Days

Applying sunscreen **every day** to exposed skin can help prevent skin cancer. Don't reserve the use of sunscreen only for sunny days. Even on a cloudy day, up to 80% of the sun's ultraviolet rays can pass through the clouds. Sunscreen should be applied to dry skin 15 to 30 minutes before going outdoors.

When using sunscreen, be sure to apply it to all exposed areas, and pay particular attention to the face, ears, hands and arms. Coat the skin liberally and rub it in thoroughly – most people apply only 25% to 50% of the recommended amount of sunscreen. One ounce, enough to fill the palm of your hand, is considered a good amount needed to cover the exposed areas of the body properly. Don't forget that lips get sunburned, too. Apply a lip balm that contains sunscreen with an SPF of 15 or higher.

Be sure to dispose of outdated sunscreen, as it will have lost its effectiveness. Reapply sunscreen frequently during the day and at least every two hours. There are so many types of sunscreen that selecting the right one can be confusing. Sunscreens are available in many forms, including ointments, creams, gels, lotions, sprays and wax sticks. The type of sunscreen you choose is a matter of personal choice. Creams are best for individuals with dry skin, but gels are preferable in hairy areas, such as the scalp or male chest. Roll on or rub on sticks are good around the eyes and other facial areas. Creams typically yield a thicker application than lotions and are best for the face. Spray-on sunscreen should be

rubbed on the skin immediately after spraying to coat the skin evenly.

Ideally, sunscreens should be water-resistant, so they cannot be easily removed by sweating or when in the water, and should have a high SPF number (at least SPF 30) that provides broad-spectrum coverage against both UVA and UVB light.

Scheduling Daily Tasks and Shade

Although working outdoors when the sun is less intense, before 10 a.m. or after 4 p.m., may not be feasible, sometimes rescheduling chores where exposure is lessened can be achieved. Even though the sun may be less intense in the morning and late afternoon, damage to the skin is still possible and sunscreen is recommended. Seeking shade may have obstacles but creating shade where you work with an umbrella or pop-up tent is a great idea. We often see non-cab tractors with a canopy or umbrella to protect the operator from exposure to the elements.

Conclusion:

It's never too late to protect yourself from the sun and minimize your future risk of skin cancer. Understanding how to best protect your skin from the sun can help prevent melanoma, the deadliest form of skin cancer as well as other skin cancers. Early detection is key – so get checked at least annually by a doctor and especially if you see something suspicious on your skin.

Resources:

The Skin Cancer Foundation https://www.skincancer.org/

News

MDAR Launches Local Food Purchase Assistance Cooperative Agreement Program (LFPA)

MDAR is soliciting proposals for projects that specifically address the goals of the United States Department of Agriculture ("USDA") Local Food Purchase Assistance Cooperative Agreement Program ("LFPA"). The purpose of this program is to maintain and improve food and agricultural supply chain resiliency. To access the RFR visit COMMBUYS - Bid Solicitation.

MDAR is seeking projects to purchase domestic food from local and regional producers, target purchases from Socially Disadvantaged farmers/producers, and distribute food to underserved communities. Preference will be given to applications that demonstrate how relationships and distribution channels will continue past the conclusion of this program. The suggested dollar value of projects is between $50,000 and $750,000 and this program does not have a Federal cost sharing or matching requirement.

Applications are due by 2:00 pm on September 16th, 2022, and must be submitted to LFPAGrant@mass.gov. Applicants may submit questions regarding the RFR and application process. Please submit questions by email to: LFPAGrant@mass.gov.

An informational webinar where questions may be asked will be held for interested applicants on Thursday, August 18, 2022, 6:00pm. The webinar will be 1 to 1.5 hour(s) in length, and cover the LFPA Grant Program and provide information on accessing the MassGrown Exchange platform. Follow this link to register for the webinar.

Visit this webpage to learn more about the LFPA Program.

MDAR now accepting applications for the Ag Food Safety Improvement Program

The goal of the Ag Food Safety Improvement Program (AFSIP) is to support **produce and aquaculture** operations that are looking to upgrade their food safety practices that work towards minimizing the risk of microbial contamination and food-borne illnesses, meet regulatory requirements, and improve market access. AFSIP is a competitive, reimbursement grant program that funds 80% of total project costs up to $50,000.

Applications are due by 4:00PM on Friday, September 30, 2022. Please refer to the AFSIP website for more information and a copy of the application: www.mass.gov/how-to/agricultural-food-safety-improvement-program-afsip

New Jumping Worm Resources from UMass Extension

Are you looking for answers to questions about invasive jumping worms (*Amynthas* and *Metaphire* spp.)? UMass Extension has a new resource that includes over 70 questions from the audience of our 2022 Jumping Worm Conference. Questions and answers are arranged by topic, including but not limited to: identification, biology, impacts of jumping worms on soil, bioaccumulation of heavy metals, mulch, soil, compost, and plant sales, management research, and more!

Invasive Jumping Worm Frequently Asked Questions

Massachusetts Tomato Contest to be held on August 23

The 37th Massachusetts Tomato Contest will be held at the Boston Public Market on Tuesday, August 23. 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 23 or drop their entries off with a registration form to one of the regional drop off locations on Monday, August 22. Drop off locations include sites in Great Barrington, South Deerfield, Worcester, 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 36th 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.

Questions? Contact David Webber, David.Webber@mass.gov.

Events

UConn Greenhouse Biological Control Conference

When: Tuesday, August 16, 2022

Where: Jones Auditorium, Connecticut Agricultural Experiment Station, New Haven, CT

Registration: $30. Pre-registration required. Registration includes a bagged lunch. Click here to register.

UConn Extension is sponsoring a Greenhouse Biological Control Conference. The speakers featured at this educational program include:

- *Ron Valentin*, Anatis BioProtection, who will be speaking on **Update on Banker Plants**
- *Suzanne Wainwright Evans*, Buglady Consulting, who will be speaking on **Releasing Natural Enemies, and Grower Case Studies: What's Working?**
- *Michael Brownbridge*, Bioworks, who will be speaking on **Enhancing the Use of Biological Fungicides in a Biologically Based IPM Program**
- *Elwood Roberts*, Plant Products/Biobest, who will be speaking on **Tips on How to Effectively Integrate Biological Controls and Chemical Controls**

Registration or refund questions? Contact Carla Caballero, carla.caballero@uconn.edu.

Program or payment questions? Contact Leanne Pundt, leanne.pundt@uconn.edu.

Disclaimer: Program format is subject to change based on the University of Connecticut and the State of Connecticut's COVID 19 guidelines and policies. If access to the venue or seating capacity changes, the program will be changed to a virtual format.

**This work is supported by the Crop Protection and Pest Management grant no. 2017-70006-27201 from the USDA National Institute of Food and Agriculture.*

Soil Health in the Field: Earthworm Sampling and Earthworm Indicators

When: Tuesday, August 30, 2022, 9:30am-1pm

Where: UMass Crop & Animal Research & Education Center, 89 River Rd., South Deerfield, MA 01373

Registration: Free! Space is limited. Click here to register.

Earthworms are a favorite field-indicator of soil health. While you might think all earthworms are created equal, earthworms are categorized based on behavior and location in the soil. Learning to identify the earthworms that we sample can enhance our interpretation of this soil health indicator and give us a better understanding of soil processes. This workshop is lead by entomologist Dr. Olga Kostromytska with UMass Extension and earthworm expert Dr. Annise Dobson of Yale University. This workshop is appropriate for complete beginners and experienced samplers alike. We will take samples in row crop, hayfield, and forest soils and practice identification using a key, hand lens, and dissecting microscopes. Earthworm types collected from each of the three fields will be compared, and we will discuss how we can use these findings to interpret the soil health. This is a translatable skillset valuable for agricultural service providers, farmers, and scientists.

If you would like to stay for a BYOL picnic (bring your own lunch) please feel welcome to do so. Bring a lawn chair or picnic blanket to sit outside, enjoy the scenery, and chat with soil health minded friends and colleagues. *Coffee and donuts provided in the morning.*

Twilight Meeting at Harvest Farm - NEW DATE!

When: Thursday, September 8, 2022 from 4-6 pm, followed by food and refreshments (Originally scheduled for August 24)

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

Harvest Farm in Whately/South Deerfield will host us for a twilight meeting on the cold chain--keeping produce cold from harvest to market. Chris Callahan from UVM Extension Ag Engineering will join us to talk through harvest strategies, pre-cooling techniques and equipment, and produce storage including cooler maintenance. We'll tour the farm's post-harvest facilites and see the vacuum cooler that Harvest Farm recently purchased with a MA Food Security Infrastructure Grant.

Click here to register.

Save the Date - Pollinator Habitat Workshop

When: Thursday, Sept. 22, late afternoon/early evening (exact time TBA)

Where: Just Roots Farm, 34 Glenbrook Dr, Greenfield, MA 01301

Come learn about the nuts and bolts of installing pollinator habitat on your farm, including where to find funding and who to contact for assistance. Includes a short presentation and a meet-and-greet with local service providers. Event is hosted in collaboration with CISA, NOFA, Greening Greenfield and Just Roots.

THANK YOU TO OUR 2022 SPONSORS!

NEW ENGLAND VEGETABLE & BERRY GROWER'S ASSOC.

Johnny's Selected Seeds
An employee-owned company

RIMOL Greenhouse Systems

WILSON FARM
"Growing Since 1884"

HARRIS SEEDS EST 1879

CERTIS Biologicals

Supplying Growers, Gardeners and Groundskeeping Professionals. Since 1954.
OESCO INC.™

CT GREENHOUSE
Structures & Supplies
WWW.CTGREENHOUSE.COM

FARM CREDIT EAST

Become a sponsor!

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.