RUTGERS
New Jersey Agricultural Experiment Station

Rutgers Master Gardeners of Morris County Community Garden IPM Team Report #2
May 17, 2024

WHAT'S IN THIS REPORT		
TIPS	**NEW PROBLEMS SEEN**	**SPOTLIGHTS**
• Harden off tender seedlings • Hardiness zone updates • Heirloom tomatoes	• Allium leaf miners • Asparagus beetles • Flea beetles • Imported cabbageworm adults, eggs and larvae • Leafminers • Sow bugs	• Mugwort (weed) • Canada thistle (weed)

GARDENS SCOUTED FOR THIS REPORT: Morris County Park Commission's Community Garden in Morristown and ValleVue Preserve Community Garden in Morris Township.

GENERAL OBSERVATIONS AND TIPS

Harden Off Tender Seedlings

Hardening off is a process whereby tender seedlings, started in a controlled environment, are exposed gradually to the sorts of challenges they will face outdoors such as variable temperature, direct sunlight and wind. The hardening process causes physical changes to the seedlings that will enable them to better withstand the more stressful environment they will experience in the garden. Changes include thickening of the cell walls, reduction of freeze-prone water in the plant, triggering of root development and the accumulation of carbohydrates. Soft, succulent plant growth will become firmer and harder.

Tomato plant with sunscald
Photo: J. Guarino, NJAES

Well hardened-off plants can withstand an unexpected temperature dip with minimal damage, whereas tender seedlings could be seriously damaged or even killed outright. In addition, seedlings that have not been hardened off properly can suffer sunscald of their leaves if moved too quickly into the bright and prolonged sunlight of the garden. Gradual exposure to direct sunlight over a period of days helps to avoid this type of damage.

The hardening off process involves the following steps:

- Begin 1-2 weeks before you plan to set plants out in your garden. Refer to your seed packets for transplant date in your area or, if purchasing seedlings, ask your nurseryman. Last frost date for your area is a key metric. The last frost date in Morris County, NJ typically occurs between mid- May to early June.
- For cool weather plants, daytime temperatures should be at least 45-50°F when you begin planting your seedlings outside. For heat-loving plants such as tomatoes, cucumbers, etc., wait until nighttime temperatures are consistently above 50°F.
- Place seedlings in a shaded, protected spot for 2-3 hours, bringing them in at night or if temperatures drop. Gradually increase the amount of sunlight the seedlings receive until, the final day or two, they can remain outside for 24 hours.

- Reduce frequency of watering to slow plant growth but do not allow plants to wilt.
- Avoid putting tender seedlings outside on windy days.
- A cold frame is an excellent place to harden off your seedlings but a sheltered spot, such as a porch, will also work.

Reference:
Penn State University: https://extension.psu.edu/hardening-transplants

Updated Hardiness Zone Information

In November 2023, the US Department of Agriculture (USDA) released updated information on hardiness zones across the United States. The Hardiness Zone map of the United States is based on the annual average minimum extreme winter temperature. Prior to the 2023 evaluation, hardiness zones had last been published in 2012.

The USDA has posted an interactive website (link below) where you can determine your current hardiness zone by entering your zipcode. As an example, the previous zone for zipcode 07960 (Morristown, NJ) was 6b but, due to a +3 degrees F increase in lowest winter temperature, is now 7a. Keep in mind that this is based on an average for the area covered by each zipcode, so your own exact location may differ somewhat based on its topography. For example, low lying ground may be a bit colder than higher land because cold air moves downward.

References:
2023 US Dept. of Agriculture Hardiness Zone Map:
https://planthardiness.ars.usda.gov/

Heirloom Tomatoes

Why are some tomatoes referred to as heirloom and others are not? There are specific criteria that a tomato variety must meet in order to be considered an heirloom. These include open pollination, longevity and tradition.

Open Pollination: The plant is pollinated via natural sources such as bees, moths, birds, bats, wind or rain. You can successfully save seeds from open pollinated plants and there is a high probability the plants you grow from them will

display characteristics that match the parent plants. Hybrid plants, on the other hand, are not open pollinated and any seeds you save from them will not necessarily breed true to the parents.

Longevity: This refers to varieties that have been grown for many years. Opinions differ on how many years are required. Some sources say 50 years, others 25, and still others that the variety must predate World War II (1945).

Tradition: This refers to varieties that have a history of being handed down through families or being grown in specific regions for many years. For example, the tomato variety known as the Mortgage Lifter (aka Halladay's tomato) was grown in Kentucky by three generations of the James Halladay family since the 1930's. Another example is the Sheboygan tomato, grown by Lithuanian immigrants in Sheboygan, Wisconsin since the early 1900's. Seed Savers Exchange is an organization that collects, preserves and sells seeds from all types of heirloom plants. As part of their catalog description, they include information on the variety's tradition. Website link: https://seedsavers.org/

Photo by Peter Nitzsche, County Agricultural Agent

Photo by Jack Rabin, Director of Farm Programs

Why Grow Heirlooms?

There are several different reasons why you might choose to grow an heirloom tomato variety versus a hybridized or more modern variety.

- Flavor
- Suitability for growing in a specific region
- Preserve genetic diversity
- Save seeds from one year to the next
- Avoid tomatoes that, through selective breeding, display characteristics that are not important to you such as shelf life, conformity of size and shape, or the ability to withstand the rigors of being shipped hundreds of miles. Breeding for marketability can often be at the expense of flavor. Think of the difference in taste between a supermarket tomato and one you buy at a local farmer's market or grow yourself.

Note: It is worth mentioning that heirloom varieties, which may have better flavor, may also lack the disease resistance that has been bred into more modern selections. It is worth trying several different varieties to identify those that perform well in your garden as well as taste delicious.

Rutgers New Jersey Agricultural Experiment Station has a comprehensive database of tomato varieties, heirloom and otherwise, where you can search for a specific variety and get details on characteristics such as plant size, type, fruit, etc. often accompanied by a photo of the fruit. In addition, Rutgers has a fact sheet on growing tomatoes in the home garden which includes a list of different varieties that grow well in New Jersey. Some of these are heirloom-type tomatoes. The links for these resources are included in the references below.

References:

- Rutgers NJAES Tomato Varieties database: https://njaes.rutgers.edu/tomato-varieties/
- Rutgers University: https://njaes.rutgers.edu/fs678/
- Mississippi State University: https://extension.msstate.edu/blog/what-are-heirloom-tomatoes

REPORTS ON NEW PROBLEMS

Problem: Allium Leaf Miner adults ***(Phytomyza gymnostoma)***	**Where: Morris County Community Garden (5/13) Morris Township Communnity Garden (4/20)**

Description: Allium Leaf Miner (ALM) adults are small flies that are active in Morris County from late March/early April to late May/early June. A second generation occurs in September to October / November. The adults lay eggs on the leaves. The larvae mine the leaves and migrate into the bulb and pupate. The injury caused by the larvae often leads to a rot in the bulb or neck of the plant and distortion of leaves. Injury to leeks, onions and scallions can be severe. Large numbers of orange pupae may also be found in harvested alliums, particularly leeks.

Feeding marks from ALM adults

Photo: M. Sample, NJAES

ALM Adults

Photo: Pennsylvania Department of Agriculture

ALM Pupae

Photo: Pennsylvania Department of Agriculture

Plants damaged by ALM larvae

Photo: Pennsylvania Department of Agriculture

Management:

- Row covers are effective at preventing egg laying during periods of adult activity. The spring row covers can be removed in early June after the adults quit flying. Row covers should be used again in the fall to prevent damage from the second generation of adults.
- Spinosad (for example, Captain Jack's Deadbug Brew) can be used for allium leaf miners. Please spray only allium foliage (not other plants) to protect beneficial insects and pollinators.
- Removal of all host debris prior to the end of the season can help prevent overwintering.

References:

- USDA Pest Alert: http://www.nj.gov/agriculture/divisions/pi/pdf/AlliumLeafMinerAlert.pdf

Problem: Common Asparagus Beetle *(Crioceris asparagi)*	**Where: Morris County Community Garden (5/13) Morris Township Community Garden (5/6) Morris Township Home Garden (4/28)**

Description: The Common Aparagus Beetle*, Crioceris asparagi*, is 1/4 inch long, slender, and blue-black in color with three, yellowish-white squares on each wing cover. Asparagus beetle adults feed on young shoots during the harvest season, chew holes in the shoots, and lay small, dark brown eggs standing on end on the spears

There is also a Spotted Asparagus Beetle but they are usually active later in the season (mid-May).

Common asparagus beetle adult (1/4 inch long)
Photo: J. Basile, NJAES

Asparagus beetle eggs
Photo: Univ. of Maryland

Close up of asparagus beetle eggs. The eggs will hatch in a week and feed for two.
Photo: J. Basile, NJAES

Management:

- Hand pick any existing beetles, larvae and eggs and destroy them.
- Asparagus in the affected area should be harvested daily.
- The best time to check for asparagus beetles is in the afternoon when they are most active.
- Organic controls include neem, pyrethrin, and Spinosad. Be sure to read the label, make sure asparagus beetles are included, and follow the directions.

References:

- Rutgers University: FS221: Asparagus Beetles (Rutgers NJAES)
- University of Minnesota: Asparagus beetles in home gardens | UMN Extension

Problem: Flea Beetles *(many species)*	**Where: Morris County Community Garden (5/13) Morris Township Community Garden (5/4)**

Description: Since most flea beetles are very small, new gardeners often wonder what is causing the holes in their plant leaves. Flea beetles feed on many different vegetables including tomato, potato, eggplant, radish, Swiss chard, sweet potatoes, kale and others. Flea beetle infestation may affect the growth of young plants and can be a significant pest of eggplant. Flea beetles are so small they can sometimes be mistaken for specks of soil but will jump if disturbed.

There are many species of flea beetles and most feed on specific plants. Most flea beetle species are 1/20th to 1/8th inch long and are black, bronze, bluish, or brown to metallic gray in color.

Flea beetle feeding holes on radish plants
Photo: M. Albright, NJAES

Flea beetles and their characteristic feeding holes on an eggplant leaf
Photo: P. Nitzsche, NJAES

Management:

- Row covers can protect young plants.
- Plants grown from small seeds are less tolerant to flea beetle damage than transplants, thus planting large-seeded crops or transplants can help.
- Early season plantings usually have more severe flea beetle infestations. Delaying planting, if possible, can reduce flea beetle problems.

References:

- Rutgers University: https://njaes.rutgers.edu/pubs/publication.php?pid=FS233
- University of Minnesota: Flea beetles | UMN Extension

Problem: Imported Cabbage Worm Adults/Eggs *(Pierus rapae)*	**Where: Morris Township Community Garden Adults (5/1) and Eggs – (5/6) Morris County Community Garden , Larvae (5/13)**

Description: Imported Cabbage Worm butterflies lay their eggs on brassicas such as cabbage, broccoli, and cauliflower. The green color and small size of the larvae makes it difficult to detect them on the leaves of your plants but you will know they are there if you begin to see holes in the leaves.
The butterfly lays single white eggs on the underside of leaves. Eggs hatch 3 to 5 days later and the green caterpillars begin feeding on the leaves. After 2 to 3 weeks of feeding, the caterpillars pupate and form a chrysalis on or near the affected plant. This matures in about 2 weeks and the cycle begins again. In our location, it is possible to have 2 to 3 overlapping generations in a season.

If you see this…

Adult Imported Cabbageworm Butterfly

Larva
Photo: P. Nitzsche, NJAES

The larvae won't be far behind

Larva
Photo: P. Nitzsche, NJAES

Damage on cabbage plants

Damage from cabbageworm feeding
Photo: P. Nitzsche NJAES

Management:

- Handpick eggs and caterpillars and dispose of them by crushing or dumping in a jar of soapy water. The caterpillars are well camouflaged so your first inkling of a problem may be damage to leaves. Planting red cabbage varieties makes it easier to see the caterpillars.
- Row covers placed immediately after planting seedlings will keep the butterflies from laying eggs.
- Apply *Bacillus thuringiensis var. kurstaki* when caterpillars are small and actively feeding. The *BT* must be ingested to be effective.
- In the case of plants that form heads, harvest affected plants early to minimize tunneling by larger caterpillars into the head.

References

- Rutgers University: https://njaes.rutgers.edu/pubs/publication.php?pid=FS286

Pest: Leaf Miner Eggs *(Various species)*	**Where: Morris Township Community Garden (5/6) Morris County Community Garden (5/13)**

Description:
Leaf miners lay eggs that hatch within a week and the larvae burrow immediately into the leaf. They feed on the leaf tissue for nearly 12 days forming "mines" and then fall to the soil and pupate. Nearly three weeks later, the next generation of flies will hatch and the cycle begins anew. Crops most affected are spinach, Swiss chard, beets and lambsquarter.

Leaf miner larvae in Swiss chard and tunnel damage on leaf
Photo: M. Albright, NJAES

Leaf miner eggs on spinach leaf
Photo: N. Gardner, NJAES

Management:

- Remove affected leaves to help decrease the impact of subsequent generations of leaf miners. There are three to four generations per year.
- Remove nearby weeds as these may harbor leaf miners. Keep the garden clean.
- Rotate crops as pupae may overwinter in soil.
- Thorough cleanup of debris in the fall.
- Spinosad (Captain Jack's Deadbug Brew) and Neem Oil may help prevent egg laying, but will not kill the larvae that are already in leaves. Timing is critical, scout your plants for eggs.
- Row covers can be effective.

References

- Rutgers University, https://njaes.rutgers.edu/pubs/publication.php?pid=FS276
- Penn State Extension https://extension.psu.edu/leaf-miners

Problem: Sowbugs and Pillbugs (*Porcellionidae* family)	**Where: Morris Township Community Garden (5/6) Morris County Community Garden (5/13)**

Description: Friend or foe? Usually considered beneficial due to its contributions breaking down dead matter, this tiny crustacean can also prove a nuisance, especially when present in great numbers. They will feed on seedlings, fruit that comes in contact with the ground, such as strawberries and melons, and root crops.

Characteristics include a grey-brown armored exoskeleton, with seven pairs of legs, length of half inch, antennae and two pointy 'tails' at the end. Sowbugs differ from Pillbugs, aka the Roly-Poly, as the end appendage prevents them from their namesake rolling response when disturbed. They thrive in moist soils, and do not bite. Their natural predators are small mammals, spiders, beetles, and toads.

Sow bugs at base of radishes
Photo: C. Mathis, NJAES

Pillbugs and Sowbugs
Photo: J. Kalish, University of Nebraska

Management:

- To prevent damage to tender plants, eliminate garden debris, leaf piles, fallen fruit and weeds from gardens and growing areas.
- Use coarse mulch which will allow water to drain easily. Improve air circulation by providing trellises for vines.
- If possible, raise fruits like strawberries and melons above the ground.
- Apply diatomaceous earth as a barrier; it will act as a desiccant and may protect plants.
- Practice good garden sanitation to remove hiding spaces.
- The use of landscape fabric can be effective to create a barrier between soil, seedlings, and low fruiting plants.

References:

- University of Nebraska: https://lancaster.unl.edu/pest/resources/001sowbugs.pdf
- University of California: https://ipm.ucanr.edu/PMG/GARDEN/FRUIT/PESTS/sowbugs.html#:~:text=Solutions,surfaces%20are%20drier%20by%20evening.

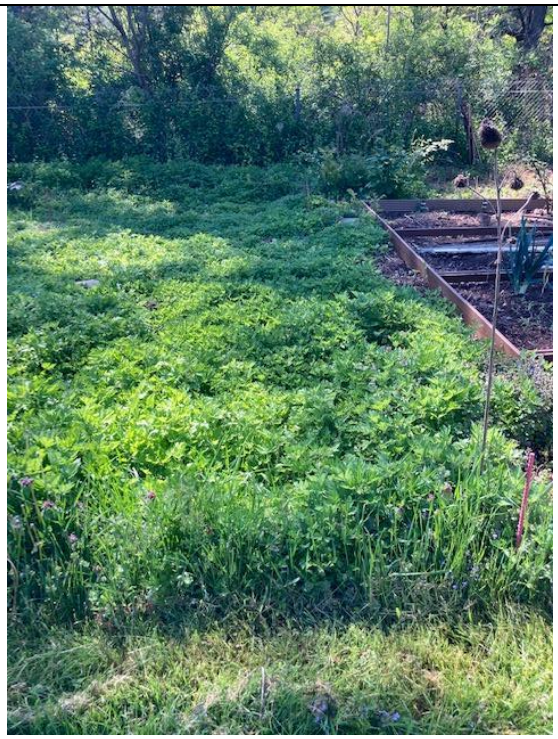
WEED SPOTLIGHTS

Mugwort
(Artemisia vulgaris)

Description: Mugwort is an herbaceous clump-forming perennial. Highly invasive, it is difficult to control once established. The plant reaches a height of four feet and has an odor similar to chrysanthemums. It reproduces by both seed and a spreading rhizomal system.

Control of mugwort is best accomplished by cutting the plant to the ground, and then covering with a tarp or cardboard with mulch on top of that. The longer the coverings are in place, the better the results. Do not till the mugwort. This will cut up the rhizomes forming many more new plants. As with most weeds, early eradication is easier and more successful early in the Spring.

Mugwort
Photo: B. Monaghan, NJAES



A community garden plot overgrown with Mugwort
Photo: B. Monaghan, NJAES

References

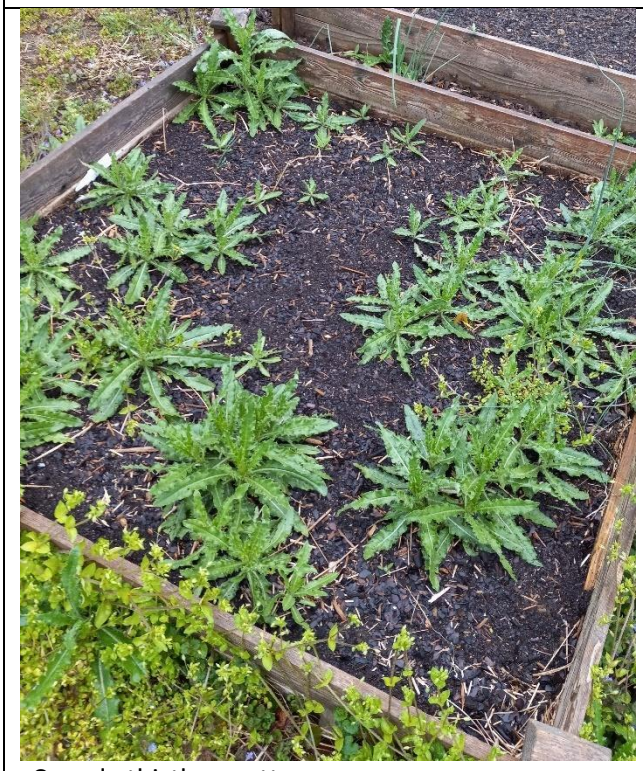
- University of Maryland https://extension.umd.edu/resource/mugwort

Canada Thistle
(Cirsium arvense)

Description: Canada thistle is a highly invasive, non-native perennial that can spread rapidly through its extensive horizontal root system. Each year it appears as a rosette of lobed, spiny-edged leaves close to the ground. Left to grow undisturbed, it can reach a height of 4 feet. This variety of thistle grows as separate male and female plants. The male plants do not produce seeds but a female plant can produce up to 5000 seeds that disperse easily and remain viable in the soil for up to 20 years.

Limited patches of this aggressive plant might be managed by using a digging fork to carefully lift the plant and as much of the root system as possible. Any bits of root left behind can, potentially, generate new sprouts. Remove all parts of the plant and dispose of it away from the garden. Avoid placing it on the compost pile. Then monitor the area regularly and dig up any new plants when they are small.

An alternative method is selective cutting or mowing. Constantly cutting the plant down stresses the root system which consumes its carbohydrate resources producing new shoots without sufficient replenishment through photosynthesis. You must be consistent in cutting down new plants every 7-10 days in order for this method of eradication to be successful.



Canada thistle rosettes
Photo: M. Olin, NJAES

Closeup of Canada thistle
Photo: M. Olin, NJAES

Fact Sheet / References

- Rutgers University, https://njaes.rutgers.edu/pubs/publication.php?pid=FS1173
- North Dakota State University, https://www.ag.ndsu.edu/publicationS/crops/organic-management-of-canada-thistle

ADDITIONAL RESOURCES

All Rutgers Gardening and Landscaping Fact Sheets & Bulletins
https://njaes.rutgers.edu/pubs/subcategory.php?cat=5&sub=1001

Rutgers Master Gardener Program https://njaes.rutgers.edu/master-gardeners/

Rutgers Soil Testing Laboratory https://njaes.rutgers.edu/soil-testing-lab/

Community Gardening Series https://njaes.rutgers.edu/community-garden/

Office of the New Jersey State Climatologist https://climate.rutgers.edu/stateclim/

Rutgers New Jersey Weather Network https://www.njweather.org/

Ticks and Tick-borne Disease https://njaes.rutgers.edu/tick/

Rutgers NJAES You Tube Channel https://www.youtube.com/user/RutgersNJAES

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