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

### **GENERAL OBSERVATIONS AND TIPS**

Gardens have really woken up and are showing lush growth. As plentiful growth of produce continues, conditions for weeds and garden pests are also ideal. If you continue close observations of your plots, you may be able to mitigate small issues and prevent them from becoming larger problems. Many cool weather crops like lettuce are at their peak. Make sure to pick them before they start to go to seed.

### **Keep Weeds in Check with Mulch**



Keeping weeds in check can be much easier if you cover bare soil with mulch. A variety of materials can be used for mulch. Almost anything that covers the soil can be used as mulch. Organic materials such as grass clippings, straw or shredded leaves have the added advantage that they will eventually add organic matter to your soil. They also will decompose over time, so they don't need to be removed. Inorganic materials such as plastic can provide more permanent soil coverage but may need to be removed at the end of the season. These articles from Rutgers (https://njaes.rutgers.edu/fs058/) and the University of Missouri contain information on a variety of mulch options. https://extension.missouri.edu/publications/g6960.

Mulch also helps moderate soil temperature and moisture. Of course there are downsides. If applied too early in the season, some mulches can slow garden warming in spring. We've had enough hot weather in Morris County this season that that should no longer be a problem. Mulch can provide protection for many garden

pests. If you notice pests like slugs feasting on your precious plants, you may want to pull the mulch away from the plantings.

Photo: Mulched lettuce, M. Sample, NJAES Page 1

## **Develop a Good Watering Strategy**

It's important to have a good watering strategy in place to help your plants strengthen and thrive. Once plants are established, it's usually best to water deeply and infrequently. This encourages plants to develop deep root systems that can help them better handle stressors. In general, watering vegetable crops once every 2 or 3 days (if there's no rain) is a good rule of thumb. Of course there are exceptions, such as unusually hot weather. Watering at the base of plants rather than overhead watering is almost always a good choice. Wet leaves create conditions that favor plant diseases.

### **Consider Plant Supports**



If you haven't installed plant supports yet this year, you may want to consider plant cages, stakes, or trellises. This can help keep developing fruits from direct contact with the soil which can minimize some diseases, soil borne insects, and damage from snails and slugs. It can also save precious garden space.

Photo: Peas with plant supports, C. Mathis NJAES

### **Avoid Overcrowding Your Crops**

It's about the end of planting season for summer crops in our area. If you do plant another succession of crops like beans or squash, try to avoid overcrowding.

Try to harvest ripe crops at their peak of flavor and enjoy the rewards of your gardening efforts.,

### Help Your Soil Be The Best It Can Be

You may not think of your soil when planning your vegetable garden, but you should. Soil is the backbone of your garden plot. Soil structure and fertility in large part determine how well plants will grow.

You can get your soil tested to determine what nutrients it contains. This is particularly useful if you have had problems with plant vigor in previous years. The analysis provided will give specific information on what major nutrients should be added for optimum fertility for crops you wish to grow. Soil testing kits are available from your County Extension Office <a href="https://njaes.rutgers.edu/county/">https://njaes.rutgers.edu/county/</a> or go online to the Rutgers Soil Testing Laboratory. <a href="https://njaes.rutgers.edu/soil-testing-lab/">https://njaes.rutgers.edu/soil-testing-lab/</a>

Soil pH is extremely important as well. Most vegetables and fruits grow well in a relatively neutral soil. A pH between 6 and 7 is good for growing most vegetables. 6.5 is ideal. There are exceptions. Blueberries for example thrive in acidic soil, with a pH of about 4.5. A soil test will measure pH, or it can be measured separately.

Soil structure is also extremely important. Plants struggle in compacted soils. Air, water, and nutrients need to be able to penetrate the soil to reach root systems. Simple steps like not walking in planting areas, especially when wet, can help significantly. Also, keeping soil covered generally helps it remain more friable. Organic mulches will also add organic matter as they decompose. Keeping weeds in check can prevent them from using up nutrients that your crops could use.

Ideally soil should contain between 3 and 6 percent organic matter. Organic matter will decompose over time, so it's important to continually add more. One of the best ways to add organic matter is to add compost to your plot. You can add compost before planting or at planting time and you can side-dress with it throughout the growing season. You can purchase compost or sometimes get it from your town, but if you have room consider making your own. You'll know

what's in the compost, so you can avoid contaminants. Besides getting free fertilizer and soil conditioner, you can put garden and kitchen waste to use instead of adding it to the waste stream. Avoid putting obviously diseased garden waste in your compost pile or weeds with seed heads on them.

Aged manure can also improve soil health and fertility. Avoid fresh manure though as it can burn plants or contain pathogens.

Be aware of what's in anything you add to your soil. You don't want to add organic matter that contains substances toxic to your plants. For instance, if you mulch with grass clippings from a lawn recently treated with herbicides, the trace of the herbicides left in the clippings could damage or even kill your plants. Many lawn herbicides are targeted to kill broadleaf weeds. Many of the plants you want to thrive are broadleaf plants (think lettuce, for instance) and could also be harmed.

There is considerable debate about whether rototilling helps or harms garden soil. It certainly can break up hard soil in the short term and disrupt weeds. Negatives are that it can bring weed seeds to the surface, disrupt the soil web, and create a hard pan. Much garden literature now recommends a no-till or low-till approach. Mulching or using cover crops can give you many of the advantages of tilling without some of the drawbacks. There's also a case that this is easier on the gardener.

There is a lot going on in your soil, and most of us don't truly understand it all. By using some commonsense procedures, you can improve your soil texture and fertility. In general, try working with nature, not against it. That should result in improved yields over time.

## **REPORTS ON NEW PROBLEMS**

# Disease: Basil Downy Mildew (Peronospora belbahrii)

## Morris Township Community Garden (6/3)

**Description:** Basil Downy Mildew is neither a true fungus nor a mold, but a specialized pathogen called "oomycetes." It is wind-borne and can spread quickly, especially during wet, humid conditions. Infected plants develop yellow leaves that can be misdiagnosed as a nutrient deficiency or due to waterlogged soil, However, check the underside of the leaf, and there you'll find a fuzzy mass of purplish-brown spores. Commonly grown sweet basils, such as Genovese, are the most susceptible to downy mildew, but new resistant cultivars are showing potential. Spice types such as Thai, Cinnamon, Lemon, Lime or Red Rosie are also less susceptible.





Underside of basil leaf with fuzzy purplish brown spores of Downy Mildew Photos: M. Albright, NJAES

Upper side of a basil leaf with yellowed splotches of Downy Mildew



Devotion Obsession Rutgers resistant varieties showing no signs of disease. Photos: M. Sample, NJAES

### Management:

- Plant resistant varieties. Rutgers has released resistant varieties from their basil breeding program. Try planting Devotion, Obsession, Passion or Thunderstruck.
- Cultural practices include proper plant spacing for optimum air flow, plant in full sun and avoid overhead watering.
- Pathogen is transmitted by wind, rain splash, contaminated seed and plants.
- The disease moves from the bottom of plant to the top of plant, so harvest any unaffected leaves from top of plant and use promptly.
- Remove and throw out infected plants to reduce the spread of disease.
- Grow some plants in containers indoors.

- Rutgers Fact Sheet 1279: <u>https://njaes.rutgers.edu/fs1279/</u>
- Rutgers University: <u>https://sebsnjaesnews.rutgers.edu/2020/09/james-simon-a-breakthrough-in-the-war-against-basil-downy-mildew/</u>
- Cornell University: <u>https://www.vegetables.cornell.edu/pest-management/disease-factsheets/basil-downy-mildew/</u>

## **Problem: Slugs and snails** (members of the mollusk phylum)

## Morris Township Community Garden (6/2), Morris Township home garden (6/3)

**Description:** Slugs and snails are both members of the mollusk phylum and are similar in biology. A key difference is that snails have a shell. Both can damage plants, especially small ones, if present in sufficient numbers. They prefer moist environments and are more numerous where favorable habitat exists. Weedy areas, dense ground cover, boards, or even mulch provide ideal hiding places for them. Predators, such as toads, garter snakes, and some birds, can be helpful in managing their numbers.



Slug on lettuce



Slug Photo P. Nitzsche, NJAES



Tawny slug on strawberry Photo: University of California

## Management:

- Eliminate, as much as possible, hiding areas such as weeds and debris. •
- Provide adequate air flow around plants. .
- Water in the morning and avoid overhead watering. .
- Pull back mulch if the problem is severe. .
- Try pitfall traps or bait such as beer. •

- Rutgers Fact Sheet 397: https://njaes.rutgers.edu/pubs/publication.php?pid=FS397
- University of California: https://ipm.ucanr.edu/QT/snailsslugscard.html •

## **Problem: Earwigs** *Note: Earwigs are both garden pests and beneficial predators (insect order Dermaptera)*

Morris Township home garden (5/28), Morris Township Community Garden (6/3)

**Description:** Earwigs are night feeding insects that can be both pests and beneficial predators. As pests in the vegetable garden, they may feed on seedlings, plant leaves, flowers, soft fruit and on corn silk. Leaves chewed by earwigs often have a ragged or shredded look. As beneficial predators, they feed on eggs and immature stages of insects, such as fleas and aphids, as well as snails and other slow-moving invertebrates.

Earwigs mostly feed at night and seek out dark, cool, moist places to hide during the day. Common hiding places are under loose clods of soil, boards, or dense growth of vines or weeds. The best way to identify whether they are causing damage in the garden is to look for them with a flashlight at night.

Earwigs make up the insect order *Dermaptera*. The adult earwig is identified by a pair of prominent forceps-like appendages at the tail end of its body. Most species have wings under short, hard wing covers, but they seldom fly. Immature earwigs look like adults except they are smaller and lack wings. The adult is about 3/4 inch long and reddish brown.







Male earwig, Iowa State University

Holes in leaves of Swiss chard plant eaten by earwigs Photo: M. Albright, NJAES

## Earwig on Horseradish Photo: N. Gardner, NJAES

### Management:

- Earwigs can be trapped with a rolled-up newspaper, corrugated cardboard, bamboo tubes, or a short piece of hose. Place these traps on the soil near plants just before dark and shake accumulated earwigs out into a pail of soapy water in the morning.
- Remove hiding sites for earwigs, such as weeds, piles of rubbish, and leaves. Mulches may also harbor earwigs.
- Natural enemies include toads, birds, and other predators. Chickens and ducks will consume many earwigs.

- University of Connecticut: <u>https://homegarden.cahnr.uconn.edu/factsheets/earwigs/</u>
- University of California IPM: <u>https://ipm.ucanr.edu/PMG/PESTNOTES/pn74102.html</u>

## Tomato Plant Disease: Early Blight (*Alternaria linaria*, formerly known as *A. solani*) & Septoria Leaf Spot (*Septoria lycopersici*)

Madison Community Garden (5/27)

**Description:** Septoria and early blight are common diseases seen in tomato plants in New Jersey. The diseases are caused by distinct pathogens but have a similar appearance. They thrive in similar conditions and can coexist. Management and prevention are the same. Both diseases usually begin on the lower, older leaves of plants. As the condition progresses newer, higher leaves are affected, wither and defoliate. Prolonged wet humid weather is favorable to these fungi and allows the condition to worsen. The disease spores can overwinter on plant debris. Good cultural techniques can help prevent spread, or at least slow its progress. Use of a copper-based fungicide can work as a preventative, but it needs to be applied repeatedly. As with any garden chemical, read and follow the label instructions carefully.

Septoria leaf spot is a soil-borne fungal disease that only infects tomato leaves and stems. The spots enlarge to 1/8-inch in diameter and are distinguished by a dark brown edge with a white or gray center. As the disease progresses and more leaf spots develop, the areas surrounding spots will turn yellow causing leaves to wither and die.

Early blight is also a fungal tomato disease that thrives in wet, humid weather. It is wind-borne, soil-borne and can be introduced by purchased plants or infected seed. Early blight is characterized by a few (5 to 10) brown, circular spots up to half an inch diameter with concentric rings or ridges that form a target-like pattern surrounded by a yellow halo. As the disease progresses, stems and fruit also become infected forming dark, sunken spots. Dark, sunken cankers with concentric rings may also appear at or above the soil line on stems in the case of an *Alternaria* infection.

Over time, the plant leaf will yellow, and the leaves drop. These diseases move from plant base to the top of plant. Defoliation will reduce yield, but also exposes fruit to sunscald. It's possible to get a good tomato yield if the disease(s) arrive late in the season, so use good cultural practices to delay onset and reduce speed of transmission.

There are some varieties on the market and in development that have some resistance to multiple fungal and bacterial tomato diseases. If you have an issue with early blight and/or Septoria this year, you may want to try one of them next year to see if they do offer disease resistance and how you like the taste. Be on the lookout for more info as these varieties are tried locally.



Septoria Leaf Spot (Rutgers Fact Sheet 547)



Septoria leaf spot on tomato leaves. Photo: M. Sample, NJAES





Early blight lesion on Brandywine tomato leaf. Photo: M. Sample, NJAES

Early blight characteristic concentric brown lesion and yellow halo.

Photo: Rutgers Fact Sheet 547

### Management:

- Avoid overhead watering; use drip irrigation or water at the base of plants. Water early in the day to allow plants to dry quickly.
- Mulch with landscape fabric or straw early to prevent the fungus from splashing up onto the plant. Use hardwood mulch for paths only.
- Good air circulation provide at least 18" spacing between plants. Fungal diseases like moist, humid conditions.
- Stake or cage plants to limit foliage and fruit contact with the soil.
- Crop rotation of three years or longer. Try planting cultivars with some resistance to early blight such as Juliet, Mountain Magic, Jasper, Iron Lady, or Verona. Examples of cultivars that show resistance to Septoria are Brandywise, Heather and Green Zebra.
- Remove all plant debris since fungal spores of the diseases can overwinter in infected plant material.
- Control weeds.
- There are some organic copper-based fungicides that can help prevent the disease. Be sure the product label includes the plant and disease and follow all instructions on the label.

- Rutgers Fact Sheet 547: <u>https://njaes.rutgers.edu/fs547/</u>
- Cornell University: <u>https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/8/5755/files/2020/05/Cornell-Disease-Resistant-Tomatoes-2019.pdf</u>

# Problem: Mexican bean beetles adults and eggs (Epilachna varivestis)

## Morris Township Community Garden (5/31)

**Description:** Mexican bean beetle adults are round-to-oval hard-bodied insects, about 1/3rd inch in length, yellow to coppery brown, with 16 black spots. Females lay clusters of yellow eggs on the undersides of leaves. They resemble ladybug beetles and are, in fact, in the same family. Larvae are yellow, cylindrical but tapered towards the rear, with branched spines. Pupae are also yellow and are on the undersides of leaves. These beetles remove leaf tissue between the veins, resulting in a skeleton-like or lacy appearance. Severe defoliation may affect the harvest.



Mexican bean beetle adult and eggs Photos: M. Albright, NJAES



Mexican bean beetle larvae feeding on leaves





Extensive leaf damage from Mexican bean beetle feeding Photo: M. Sample, NJAES

Mexican bean beetle pupa Photos: M. Albright, NJAES

## Management:

- Inspect plants and handpick adults, eggs, larvae and pupae.
- The eggs, larvae, and pupae are usually found on the undersides of leaves.
- Clean up and remove all plant debris after harvest.
- Try growing fast maturing varieties of beans.

### **References:**

- Rutgers University Fact Sheet 227: <u>https://njaes.rutgers.edu/pubs/publication.php?pid=FS227</u>
- Mark Meyer et al., Phillip Alampi Beneficial Insect Laboratory Division of Plant Industry, "Biological Control of the Mexican Bean Beetle," 2017

report: https://www.nj.gov/agriculture/divisions/pi/pdf/mexicanbeanbeetle.pdf 2006 report:

### Problem: Whitefly Nymphs (Aleyrodes proletella)

Morris Township Community Garden (6/1)

**Description:** Whitefly nymphs were seen on kale plants in the Morris Township Community Garden. Overwintered adults had been seen earlier in the season and were reported on in Report No. 1.

Cabbage whiteflies are an emerging pest in the Northeast US where they were first seen in 1993. They have also been reported in, at least, California and Oregon. They originated in Europe and are in many locations worldwide. Cabbage whiteflies are primarily a problem for kale and brussels sprouts. They overwinter, even in Canada.



Whiteflies on the underside of a kale leaf Photo: M. Albright, NJAES



A heavily infested kale leaf Photo: M. Albright, NJAES



A Close up of cabbage whiteflies showing their identifying grey spots. The small white ovals are other stages of the whitefly lifecycle. Photo: P. Nitzsche, NJAES

### Management:

Inspect overwintered Brassica plants early in the gardening season. If infestations of whiteflies are found, bag and remove the plants. As the weather warms up, the whiteflies will start to fly when disturbed and will become more difficult to remove. If the whiteflies are left on overwintered plants in the garden, they will infest new Brassica plants. Populations of whiteflies can grow quickly.

- New England Vegetable Guide: <u>Insect Control | UMass Amherst New England Vegetable Guide</u> (<u>https://nevegetable.org/crops/insect-control-3</u>)
- Rutgers Fact Sheet 204, Whiteflies: <u>https://njaes.rutgers.edu/pubs/publication.php?pid=FS240</u> (Note: this fact sheet is being updated to say that cabbage whiteflies are now in New Jersey and overwinter.)

## **Problem: Striped cucumber beetles**

(Acalymma vittatum)

## **Morris County Community Garden (6/10)**

**Description:** Striped cucumber beetles cause feeding damage on the foliage and fruit of cucurbit plants (cucumbers, squash and pumpkins). Importantly, striped cucumber beetles carry the bacterial wilt pathogen that can cause plants, especially cucumbers, to wilt and die. Cucurbits are broadly susceptible. These beetles become active in late May or early June and feed on the blossoms of early flowering plants, such as dandelions, apples, and hawthorn, until their host crops are available.



Striped Cucumber Beetle Adults Photo: M. Albright, NJAES



Damage Caused by Striped Cucumber Beetle on Zucchini Plant Photo: M. Olin, NJAES

### Management:

- Check for cucumber beetles early in the season, especially in the cotyledon and first to third true-leaf stage, when the plants can suffer defoliation and bacterial wilt. Once beetles are present, monitor more frequently (every couple of days).
- Keep your garden clean. Remove weeds in and around your garden, as they may be potential hosts for adults. If a plant is showing signs of bacterial wilt, remove the infested plant before more beetles can feed on the plant and spread the bacterium.
- Use a physical barrier, such as a floating row cover, during early to mid-June to keep the Striped cucumber beetles away from your plants. Be sure to remove the barrier when cucurbits start to flower unless you are growing a parthenocarpic variety (one that doesn't require insect pollination).
- Choose a pesticide that has a low impact on beneficial insects, such as ladybird beetles and pollinators. Neem is a plant-based pesticide that prevents insects from feeding, which eventually kills them. Spinosad and pyrethrins can also be used. Pyrethrins should come in contact with the beetles to be effective.

- Rutgers Fact Sheet 225: Cucumber Beetles: <u>https://njaes.rutgers.edu/pubs/publication.php?pid=FS225</u>
- Rutgers Fact Sheet 1123 Vegetable Insect Control Recommendations for Home Gardens: <u>https://njaes.rutgers.edu/fs1123/</u>
- University of Minnesota Extension Cucumber Beetles in Home Gardens: <u>https://extension.umn.edu/yard-and-garden-insects/cucumber-beetles</u>

## Problem: Spotted cucumber beetles on squash aka Southern corn rootworm (Diabrotica undecimpunctata howardi)

## Morris County Community Garden (6/10)

**Description:** Spotted cucumber beetles were also found on zucchini plants, very close to a striped cucumber beetle. The 2 pests are quite similar. Both species of cucumber beetle adults cause feeding damage on the foliage and fruit of cucurbit plants (cucumbers, squash, and pumpkins). Adults overwinter in plant debris, emerge, and begin feeding on seedlings. Mating begins and eggs are laid on the soil. The larvae feed on roots and stems, pupate and the cycle begins anew. There are one to three generations per year.

Spotted cucumber beetles also attack asparagus, beets, cabbage, corn, eggplant, beans, peas, potato, tomato, and a wide variety of flowers. The feeding injury caused by the spotted cucumber beetle is usually less severe than that of the striped cucumber beetle. Both species of cucumber beetles carry the bacterial wilt pathogen that can cause cucurbit plants, especially cucumbers, to wilt and die.



Life stages of Spotted Cucumber Beetle from larvae, pupae to the golden, 12 spotted adult. The beetle undergoes complete metamorphosis.

Photo: G. M. Ghidiu, Rutgers University



These collapsed, wilted vines will never recover, as the bacteria multiplies rapidly. Once found wilting, plants succumb within a week. Cull plant immediately, to help stop the spread, as the bacteria can also be found in the beetles' feces.

Photo: M. Albright, NJAES

## Management:

- Scout for cucumber beetles early in the season. They overwinter as adults, emerge in spring, and begin feeding on seedlings, especially those in the cotyledon and first to third true-leaf stage. Once present, monitor often.
- Practice good garden sanitation. Remove weeds and dead plant debris. If a plant is showing signs of bacterial wilt, remove the infested plant before more beetles can feed on the plant and spread the bacterium.
- Use floating row cover to prevent the cucumber beetles from feeding and laying eggs. Be sure to remove the barrier when cucurbits start to flower unless you are growing a parthenocarpic variety (one that doesn't require insect pollination such as Beit Alpha or Diva).
- If you decide to try a squash trap crop such as Blue Hubbard, it is vital to scout that. The point of trap crops is to lure away, but they still need monitoring.
- Try using OMRI listed Surround. A kaolin clay that creates a barrier coating, protecting plants from feeding and egg laying. Yellow sticky traps with Cucumber beetle lures have variable results, since beneficials may also be drawn. Neem is a plant-based pesticide that prevents insects from feeding, which eventually kills them. Read and follow all recommended instructions for safe handling and application.

- Rutgers University Fact Sheet 225: <u>https://njaes.rutgers.edu/pubs/publication.php?pid=FS225</u>
- Rutgers University Fact Sheet 1123: <u>https://njaes.rutgers.edu/fs1123/</u>
- University of Massachusetts: <u>https://ag.umass.edu/vegetable/fact-sheets/cucumber-beetle-spotted</u>

## Spotlight

## Wild bees

**Description:** Some community gardens have begun to include honeybee hives to help in pollination and perhaps to aid in the preservation of the species. Wild bees can also be helpful pollinators in a home vegetable garden or community garden plot. Both honeybees and wild bees are important pollinators of a wide variety of crops. Both face many threats and their numbers have declined. Giving them a good meal of pollen and nectar from a variety of flowering plants can help them survive at least in your garden.

Honeybees are considered valuable because they pollinate many different crops and can be moved farm to farm. That mobility has also exposed honeybees to stresses. Wild bees tend to be specialists, pollinating specific plants or species. They exist in the wild. They don't require humans to manage or move them. They thrive in a pesticide-free environment with ample plants to provide pollen.

Some of the plots in the Morris County Community Garden are devoted completely or mostly to flowers. These plots are alive with native pollinators. The whole community garden likely benefits from the presence of so many pollinators. If you plant a few flowers and try to have something attractive to bees all season, you can take advantage of the bees' pollination services. Bees, unlike many wasps including yellow jackets, are rarely aggressive. Of course, it's never a good idea to provoke any animal, but given space, wild bees rarely sting. As an added bonus, many of the bees' favorite foods will also beautify your garden.



Bee on cilantro Photo: M. Sample, NJAES

Bee on poppy flower Photo: C. Mathis, NJAES



Bee on Celosia Photo: M. Sample, NJAES

### **Reference:**

• Rutgers Fact Sheet 1280: <u>https://njaes.rutgers.edu/fs1280/</u>

### **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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