RUTGERS
New Jersey Agricultural Experiment Station

# Rutgers Master Gardeners of Morris County Community Garden IPM Team Report #7
# July 15, 2022

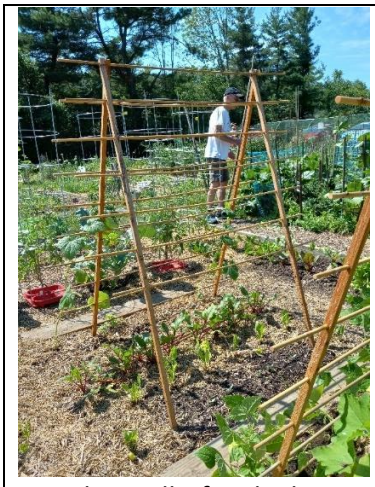
| *WHAT'S IN THIS REPORT* | | | |
|---|---|---|---|
| **TIPS** | **NEW PROBLEMS SEEN** | **PROBLEMS LIKELY TO BE SEEN SOON** | **SPOTLIGHTS** |
| • Support structures can do double duty in the garden | • Mexican bean beetle<br>• Cabbage looper<br>• Pigweed flea beetle<br>• Powdery mildew<br>• Tomato catfacing | • Tomato hornworm | • Please don't kill me – I'm a beneficial insect |

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

## *GENERAL OBSERVATIONS AND TIPS*

As we move into the hot, dry and often humid weather of summer, cool weather crops such as peas, lettuces and radishes are either dying back or bolting to flower and forming seeds. Warm weather crops such as tomatoes, squash, peppers and cucumbers are coming into their own and, with sufficient rainfall or generous watering, growing lushly. Don't we all wish we could still be harvesting lovely crisp lettuces to go with the juicy tomatoes and crunchy cucumbers our gardens are beginning to produce? With the judicious use of suitable support structures, we can!

Rather than having sprawling cucumber and squash vines snaking throughout your garden plot, consider installing one of the many available support structures and training your plants upward. This not only keeps the ripening fruits off the ground but creates a cool and shady microclimate underneath where heat tolerant lettuces and other cool weather crops can be grown well into the summer. Butterhead, romaine and red-leaved varieties are good choices. An online search through the offerings of reputable seed companies will turn up a selection of heat-tolerant varieties for you to enjoy.



Wooden trellis for climbing crop with secondary crop planted beneath
Photo: M. Olin, NJAES

Cucumbers climbing up south-facing trellis with lettuce planted below
Photo: M. Olin, NJAES

# *REPORTS ON NEW PROBLEMS*

| **Problem: Mexican bean beetle** ***(Epilachna varivestis)*** | **Where: Morris County Community Garden (7/5)** **Morris Township Community Garden (7/11)** |
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**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

Mexican bean beetle pupa
Photos: M. Albright, NJAES

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

**Fact Sheet / References**

- Rutgers University Fact Sheet 227, https://njaes.rutgers.edu/pubs/publication.php?pid=FS227
- 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: Cabbage looper caterpillar *(Trichoplusia ni)*** | **Where: Morris Township Community Garden (7/11)** |
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**Description:** Cabbage looper caterpillars are the offspring of a nocturnal moth called, appropriately, the Cabbage looper moth. The moths are brownish-gray, approximately 1 inch long with a 1-1/2 inch wingspan. They lay single round, greenish-white eggs on the upper or lower surfaces of leaves on their preferred food source plants. These include cabbage, broccoli, collards, cauliflower and turnips. Additional food sources are lettuce, spinach, celery, parsley, beets, peas, potatoes, and tomatoes.

The newly hatched caterpillars are green and might be mistaken for imported cabbageworm caterpillars except for a significant difference. Cabbage looper caterpillars have several pairs of prolegs at their head end and two pairs at their hind end. There are no legs or prolegs in the middle. Therefore, they move by "looping" in a manner similar to inchworms. As the caterpillars grow larger, they develop distinctive white stripes on their sides and back. At maturity, they will spin a semi-transparent cocoon and attach it to the underside of a leaf.

Historically, this garden pest does not overwinter in New Jersey. The parent moths migrate into the area annually in the July-August timeframe. The caterpillars can do significant damage to their food crops, first eating large, irregular holes in the leaves and then progressing to the center of the plant. Severe defoliation and stunted growth result if Cabbage looper caterpillars are left unchecked.

Cabbage looper caterpillar
Photo: Utah State Univ. Extension

Cabbage looper eggs
Photo: Utah State Univ. Extension

Cabbage looper moth
Photo: Oklahoma State Univ. Extension

**Management:**

- Crush and/or handpick eggs and caterpillars. Control while small as larger caterpillars do much more damage.
- Use row covers to prevent egg-laying by the parent moths.
- Bacillus thuringiensis var. kurstaki can be effective against Cabbage loopers as can Spinosad. Check the labels and follow the instructions.
- Eliminate weeds such as wild mustard, wild cabbages, peppergrass and shepherd's purse where caterpillars might develop.

**Fact Sheet/References:**

Rutgers University Fact Sheet 231, https://njaes.rutgers.edu/pubs/publication.php?pid=FS231
Univ. of Utah Extension: https://extension.usu.edu/vegetableguide/brassica/cabbage-looper
Oklahoma State Univ. Extension: https://extension.okstate.edu/programs/digital-diagnostics/insects-and-arthropods/cabbage-looper-trichoplusia-ni/

| **Problem: Pigweed flea beetle on Amaranth** ***(Disonycha glabrata)*** | **Where: Morris County Community Garden (7/5)** |
|---|---|

**Description:** This beetle is easily mistaken for both the Cucumber beetle and the Three-lined potato beetle due to similarities in its color and stripe pattern. While their coloration seems very similar, there are notable differences as you can see in the side-by-side photos below. The Pigweed flea beetle has pronounced black and white stripes, a red pronotum with either one or three black dots, and a black and red head.

Pigweed flea beetles feed upon plants in the Amaranth family, including pigweed, amaranth, callaloo and the flower, love-lies-bleeding. They lay their eggs at the base of the plant as well as on both upper and lower leaf surfaces. The eggs are yellow orange. The larvae are light in color (almost white), about ¼ inch long with a dark-colored head and a bumpy texture to their skin. They feed on foliage until ready to pupate at which time they burrow into the soil. After about 13 days, the mature adults emerge.

Pigweed flea beetle adult
Photo: S. Brighouse, NJAES

Three-lined potato beetle adult
Photo: Univ. of Minnesota Extension

Cucumber beetle adult
Photo: Univ. of Minnesota Extension

**Management:**

- Spray plant foliage with Spinosad (such as Captain Jack's Deadbug Brew).
- Hand pick adults and larvae. Successfully managing the first generation will help prevent subsequent generations.
- Remove pigweed and other amaranth-related plants from weedy borders as these provide a place for this pest to shelter.
- Adults overwinter in leaf litter so doing a good cleanup in the Fall will help prevent problems the following year.

**Fact Sheet / References:**

1. Connecticut Agricultural Experiment Station, https://portal.ct.gov/-/media/CAES/DOCUMENTS/Publications/Fact_Sheets/Entomology/PigweedFleaBeetlepdf.pdf?la=en

| **Problem: Powdery mildew** *(Golovinomyces orontii)* | **Where: Morris Township Community Garden (7/11)** |
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**Description**: This foliar disease is caused by windborne fungal spores. The first signs of infection are white, powdery deposits that can be found on older leaves of various cucurbit family members such as squash, zucchini, yellow summer squash, cucumbers and melons. It is difficult to avoid during a NJ summer, as favorable conditions are hot and dry weather followed by humidity. As this fungus spreads throughout the plant, you'll notice the plant leaves begin to turn yellow, dry and wither. Eventually, both the plant vigor and yield will be affected by lack of photosynthesis.
Of note, there is also normal white coloration on the leaves of many squash varieties that is **not** Powdery mildew. This coloration does not rub off, but is part of the plant's regular leaf pattern

Powdery mildew fungus spots on zucchini
Photo: M. Albright, NJAES

Normal color variation of some squash, not powdery mildew fungus.
Photo: Jennifer Basile, NJAES

**Management:**

- Provide full sun, air circulation and proper spacing. When planting at-risk crops, leave extra space between plants to promote air circulation and ample room to receive sunlight.
- Remove infected leaves to prevent spread of the disease, throw away and do not compost.
- Try a spray made with potassium bicarbonate on the leaves to help prevent fungus.
- Remove debris at season end to help decrease spreading any spores.
- Clean your tools.
- Rotate crops (3 to 4 year rotation is ideal).
- Plant more resistant varieties.

**Fact Sheet / References**

- *Rutgers FSE310 Diagnosing and Managing Important Cucurbit Diseases in the Home Garden*, https://njaes.rutgers.edu/E310/
- University of California, Agriculture and Natural Resources, http://ipm.ucanr.edu/PMG/PESTNOTES/pn7406.html
- University of Connecticut, http://www.ladybug.uconn.edu/FactSheets/powdery-mildew-on-cucurbits.php

| **Problem: Tomato Catfacing** | **Where: Morris Township Community Garden (7/11)** |
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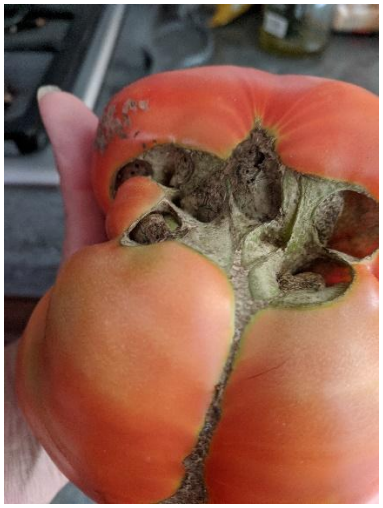
**Description:** Tomato catfacing is due to a physiological disorder. In a normal tomato, the blossom end scar is small. In a catfaced tomato, this scar is enlarged and may also present with perforations of the fruit. Some catfaced tomatoes become very misshapen as well.

The causes of this disorder are not well understood. However, cold temperatures during flowering or extreme fluctuation between day and night temperatures seem to increase the incidence of catfacing. Other possible factors might be pruning or high nitrogen levels. Heirloom tomato varieties tend to be more prone to catfacing than non-heirloom varieties.



Classic "catface" deformity on blossom end
Photo: M. Sample, NJAES

**Management:**

- Avoid setting out young plants until 1-2 weeks after the last expected frost.
- Avoid excessive pruning
- Avoid excessive nitrogen fertilization
- Grow cultivars that are less prone to catfacing.

**Fact Sheet / References**

- Rutgers FS678, FS678: Growing Tomatoes in the Home Garden (Rutgers NJAES)
- Rutgers Heirloom variety study, Table 1 (rutgers.edu)
- U Mass article, Vegetable: Tomato, Cat Facing | Center for Agriculture, Food, and the Environment at UMass Amherst
- Univ. of Maryland Extension, https://extension.umd.edu/resource/catfacing-tomatoes

## *LIKELY TO BE SEEN SOON*

**Pest: Tomato Hornworm and Tobacco Hornworm**
***(Manduca quinquemaculata) and (Manduca sexta)***

**Description:** Tomato Hornworm, *Manduca quinquemaculata,* and Tobacco Hornworm, *Manduca sexta*, are foliage and fruit eaters, and can be found on the Solanaceae family- tomatoes, peppers, potatoes and eggplant. Their appearance is nearly identical with only slight differences in their stripe pattern and the color of their "horn". Adults are gray moths with a 4-5 inch wingspan, aka hawk moths, that emerge in early summer and feed on flower nectar at dusk. Females lay eggs, singly, on the underside of leaves. Eggs usually hatch in a week, the larvae feed voraciously for a month, and then burrow within the soil to pupate. There can be two generations a year. These caterpillars have excellent camouflage and it is often difficult to find them even when you know they are there because of the damage to your plants. Seeing pellet-like excrement on lower leaves can provide a clue to where they are. Just check among the leaves and stems directly above.

If you discover a hornworm with white cocoons attached to it, leave it undisturbed. The hornworm has been parasitized by a beneficial wasp from the Braconidae family and the structures, which look like grains of rice, are actually cocoons of its offspring which have emerged and pupated after parasitizing the hornworm. The hornworm will die and the young wasps will emerge as adult Braconid wasps.

Tobacco Hornworm
Photo: J. Basile, NJAES

Hornworm that has been parasitized by Braconid wasp.
Photo: J. Basile, NJAES

Tomato Hornworm
Photo: P. Nitzsche, NJAES

Five-spotted hawkmoth, adult stage of Tomato hornworm
Photo: Utah State Univ. Extension

Carolina sphinx moth, adult stage of Tobacco hornworm
Photo: Utah State Univ. Extension

**Management:**

- Scout plants for hornworms throughout growing season. Signs are missing foliage and pellet-like excrement.
- Carefully handpick and destroy only those without cocoons.
- In the fall, clear all plant debris and till to destroy any pupae that may be in soil.
- Practice a 3 year crop rotation plan.

**Fact Sheet / References**

- Rutgers Fact Sheet 226 Hornworms https://njaes.rutgers.edu/pubs/publication.php?pid=FS226
- Purdue Univ. Extension, https://extension.entm.purdue.edu/radicalbugs/default.php?page=pests/tobacco_hornworm
- Utah State Univ. Extension, https://extension.usu.edu/pests/research/tomato-tobacco-hornworms

# *BENEFICIAL SPOTLIGHT*

This week's report includes a gallery of some common beneficial insects and what their offspring look like. Don't make the mistake of removing their eggs and larvae or nymphs because you are afraid they will damage your plants. On the contrary, they will eat the insects that are eating your plants.

## Beneficial Insects and their offspring – "Please don't kill us, we're your friends"

Gardeners often feel they are fighting a hopeless battle against insect pests in their vegetable gardens. They faithfully inspect their plants for eggs and larvae and quickly kill or remove everything they find. But wait a minute, are all those eggs actually pest eggs? Or even eggs at all? A closer look may reveal that what appears to be an insect egg is actually a cocoon housing the offspring of one of our unsung garden heros – predatory wasps. The photos below can help you recognize other life stages of some of the helpful predatory insects you are likely to find on your plants and, perhaps, prevent you from inadvertently destroying beneficial insects that can help to keep pests in your garden at reasonable levels.

**Ladybird beetle – aka Ladybug**

We all know what the adults look like but how about the offspring?

Photo: Cornell Univ. College of Agriculture and Life Sciences

Ladybird beetle eggs

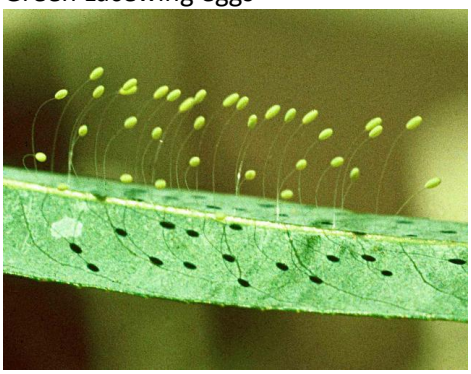
Ladybird beetle larva

Photos: Cornell Univ. Integrated Pest Management Program

**Green Lacewing**


Green lacewing adult

Green Lacewing eggs



Green lacewing larva – also known as “aphid lions” – here seen devouring aphids

All Photos: Missouri Dept. of Conservation

**Braconid wasps (*Braconidae spp.*)**

There are many species in this family but we rarely notice these tiny parasitoid wasps who prey upon caterpillars.

Newly emerging Braconid wasp

Photo: Univ. of Maryland Extension

Braconid wasp spp. Cocoons

Braconid wasp cocoons on brassica leaf

Photo: M. Olin, NJAES

Braconid wasp cocoons on Tobacco hornworm
Photo: P. Nitzsche, NJAES

**References**


- Rutgers University Fact Sheet 295, https://njaes.rutgers.edu/pubs/publication.php?pid=FS295
- Missouri Dept. of Conservation, https://mdc.mo.gov/discover-nature/field-guide/green-lacewings
- Univ. of Maryland, https://extension.umd.edu/resource/parasitoid-wasps
- Cornell University, https://biocontrol.entomology.cornell.edu/predators/Coccinella.php


***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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