RUTGERS
New Jersey Agricultural
Experiment Station

Vegetable Garden Disease & Pest Monitoring 2020
Rutgers Master Gardener Community Garden Integrated Pest Management Team
Report 7, Week of July 19, 2020

NEW PROBLEMS SEEN IN THE PAST TWO WEEKS

- Squash Vine Borer
- Mexican Bean Beetle
- Blossom End Rot
- Tomato Hornworm
- Raspberry Cane Borer
- Hail Damage

GENERAL OBSERVATIONS

The recent heatwave brings challenges for watering your garden, so try to maintain consistent moisture. Keep scouting for any pests and diseases, but most importantly, enjoy the harvest you've worked so hard for! Be sure to check out this valuable resource for ideas from recipes to food preservation- https://njaes.rutgers.edu/home-lawn-garden/nutrition-wellness.php

REPORTS ON PROBLEMS SEEN IN THE PAST TWO WEEKS

Pest: Squash Vine Borers	**Where: Morris Township Home Garden July 17**
Description : The squash vine borer, *Melittia satyriniformis*, is a significant pest of squashes and pumpkins and a lesser pest of cucurbits and melons. Frass, which is greenish / yellow excrement, indicates that borers are feeding and tunneling inside the stems of the plants. If the borer(s) are not removed, they will cause the plant to wilt and later die. The adult is a clear wing moth that lays eggs on stems and leafstalks of squash and pumpkin plants in early summer. The eggs hatch into white borers that tunnel into the stem of the plant. The borers overwinter as a cocoon and adults emerge the following year. Moths will lay eggs throughout July and August. Eggs are laid singularly or in small groups on the stem immediately above the ground surface. Eggs take a week to 10 days to hatch. Larvae enter the stem immediately, leaving a small hole surrounded by frass as the point of entry. The larvae will feed on the plant for approximately 4 weeks by continuing to tunnel through the stem of the plant. When they are ready to pupate the larvae will burrow into the soil and spin a cocoon.	

 Frass (excrement) from Squash Vine Borer on squash plant (M. Albright 2019)	 Squash Vine Borer inside a stem, (Peter Nitzsche, Morris County Agricultural Agent)	 Squash Vine Borer adult, picture from Rutgers Fact Sheet #229

Suggestions:

- Cut a longitudinal slit halfway through the vine above the frass to find and remove the borer.
- If there are multiple locations with frass, there may be multiple borers.
- Remove infested vines that cannot be saved to prevent the borers from overwintering and remove all vines once the plants have stopped producing fruit.
- Floating row covers can be used early in the season to keep adults from laying eggs on the plants. The covers need to be removed when the plant flowers to allow for pollination. If row covers are used, don't plant near locations that had borers the previous year, since adults could emerge from the soil under the row cover.
- Spinosad (Captain Jack's Deadbug Brew and Monterey Garden Insect Spray) or Bt *Bacillus thuringiensis* can be applied to kill the young larvae as they hatch from the eggs before they bore into the stem. The pesticides will not work once the larvae enter the stem. ***Read and follow all pesticide label instructions. Be cautious- read the label.

More Information: Fact Sheet / References

- Rutgers Fact Sheet: https://njaes.rutgers.edu/pubs/publication.php?pid=FS229
- University of Connecticut Fact Sheet: http://www.ladybug.uconn.edu/FactSheets/squash-vine-borer.php#
- The Pennsylvania State University: https://extension.psu.edu/squash-vine-borer

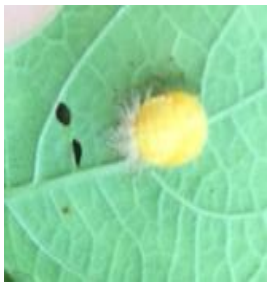
Problem: Mexican Bean Beetle	**Where: Denville Home Garden July 17**

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. 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

Eggs

Larvae feeding on leaves



Pupae
Photos: Mary Albright

Extensive leaf damage
Margot Sample

Suggestions:

- Inspect plants and handpick adults, eggs, larva 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.

More Information: Fact Sheet / References

- Rutgers Fact Sheet FS227 Mexican Bean Beetles: 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: Blossom End Rot	**Home Garden Morris Plains July 17**

Description: Blossom End Rot (BER) is a fruit disorder and is not a disease. Infected tomatoes, peppers and eggplants show darkened, leathery, sunken areas at the blossom end. The rot is related to inconsistent soil moisture and calcium deficiency. Lack of water limits calcium uptake. Blossom End rot will usually be more prevalent when the plants have been growing rapidly early in the season and then are subjected to prolonged dry weather when the fruits are in an early stage of development.

Photos Wesley Kline, Agriculture and Natural Resources Agent, Cumberland County

Suggestions:

- Keep the plants adequately watered in dry weather and properly drained in wet weather. Plants with fruit require about 1 inch of moisture each week. Inconsistent soil moisture is what drives this to develop.
- A soil pH test should be done every 2-3 years to determine if lime is needed. pH should be between 6.0 to 7.0. Lime should not be applied unless a soil test indicates it is needed.
- Pick off any fruits with Blossom End Rot since they will not recover. Fruit is safe to eat, simply cut off the non-damaged part of the fruit.

References:

- Rutgers Fact Sheet 011 Blossom End Rot: Tomatoes, Peppers, Eggplant: https://njaes.rutgers.edu/FS011/
- Rutgers Fact Sheet 678 Growing Tomatoes in the Home Garden: https://njaes.rutgers.edu/FS678/

Problem: Tomato and Tobacco Hornworm	**Where: Home Garden Morris Plains July 17**

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. Adults are gray moths with 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 then voraciously feed for a month, then burrow within the soil to pupate. There can be two generations a year.

*Do not destroy the hornworm found with cocoons. Within these are beneficial wasp eggs, which will emerge and defend your garden against the next generation.

Tomato and Tobacco Hornworms are nearly identical. Pictured here is a Tobacco Hornworm. Differences are that the Tobacco Hornworm has seven white diagonal stripes and red 'horn' on tail, whereas the Tomato Hornworm has eight stripes and a green 'horn'. Regardless, they both devour the foliage. Photos Jennifer Basile

Suggestions:

- Scout plants for hornworms throughout growing season. They are wonderfully camouflaged, so sometimes the telltale sign is simply finding your foliage has gone missing.
- 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.

References:

Rutgers Fact Sheet 226 Hornworms
https://njaes.rutgers.edu/pubs/publication.php?pid=FS226

Problem: Raspberry Cane Borer	**Where: Morris Twp. Home garden July 6**

Description: Raspberry Cane Borer*, Oberea bimaculata*, is a ½ inch, slender black beetle with long antennae and a yellow prothorax. It feeds on raspberry, blackberry, azalea, roses and oak. It has a two year life cycle. Adults emerge in June, and females lay eggs in new raspberry growth. You can find the egg laying spot by scouting for two rows of punctures about 6 to 8 inches from cane tip. This is why your cane tips are wilting. In July, the larvae will make their way down the cane and spend the winter. In the second year they will travel down the plant and spend the winter near or below ground level. In the spring, development is complete, as they pupate in the soil and emerge as adults in June.

A raspberry cane borer adult.

Photo by Jon Yuschock, Bugwood.org

Oviposition damage to a rose stem by the raspberry cane borer.

Photo by Jim Baker, North Carolina State University, Bugwood.org

Wilting Canes- Mary Albright

Adult and egg damage- North Carolina State University Extension

Suggestions:

- Scout your raspberry and brambles for any wilting tips beginning in June. Look for the two ring spots and prune a few inches below. Destroy the canes to prevent future generations.
- Regular pruning will help contain the population.

References:

- North Carolina State University Extension Raspberry Cane Borer
  https://content.ces.ncsu.edu/raspberry-cane-borer
- University of New Hampshire Extension
  https://extension.unh.edu/resource/raspberry-cane-borer-fact-sheet

Problem: Hail Damage	**Where: Morris Twp. Community Garden and Morris Twp. Home garden July 5**

Description: A recent hailstorm ripped through crops, leaving damaged and destroyed plants. As gardeners, we are truly reminded of the powers of Mother Nature, but It is disheartening to experience this crop loss.

Suggestions:

- Remove badly damaged leaves, as they are an open door to fungal disease.
- Try to salvage what you can. Plants with severely broken stems, which will not recover in the season, should be removed.
- Allow for recovery time. Some plants will come back, although this pushes the flowering and harvest a bit.
- You can reasonably replant some fast growers such as Arugula, baby lettuces, radish, bush beans, and Bok Choy.
- Row cover with wire mesh may help in high risk areas.


Sweet Potato damage and onion damage. Both should reasonably recover.
Photos: Mary Albright

References:

- Purdue University
  Vegetable Crops Hotline Hail Damage https://vegcropshotline.org/article/hail-damage/
- Cornell Cooperative Extension https://cvp.cce.cornell.edu/submission.php?id=138

A COUPLE OF WEEDS

Galinsoga spp., aka Gallant soldier and Purslane, _Portulaca oleracea_

Description:

Galinsoga is a fast growing annual that flowers from April to October. It grows 1-2 feet tall, multiple branched stem, with opposite leaves and small white flowers. As a voluminous seed producer, one plant can produce nearly 7,500 seeds in a season. Because of this, the plant can become invasive rapidly, since there is no seed dormancy. The new seed will quickly germinate, creating multiple generations in a season.
Be sure to remove early in the season to prevent seed production.

Purslane, *Portulac oleracea*, is also a summer flowering, fast growing annual. This low, crawling plant can be found throughout gardens in New Jersey. Can be maintained by hand pulling, as to prevent seed spread. Please note that if you hoe, any remaining pieces will root. Considered to be a weed, although a popular green used in many ethnic foods.
Purslane photo by Peter Nitzsche, Morris County Agricultural Agent

References

- Rutgers New Jersey Weed Gallery https://njaes.rutgers.edu/weeds/
- University of Vermont http://www.uvm.edu/vtvegandberry/factsheets/galinsoga.html
- University of Maryland Extension https://extension.umd.edu/hgic/topics/galinsoga

BENEFICIAL INSECT SPOTLIGHT

Eastern Amberwing Dragonfly

Dragonflies are an ally to the gardener. Although they are not pollinators, they are valuable as nature's pest control, since they devour mosquitos, flies, ants and wasps.

These robust, strong fliers can be seen throughout the Eastern to Central U.S, although many dragonfly species are widespread across the country.

https://hortsciences.tamu.edu/galveston/beneficials/beneficial-11_dragonflies.htm
https://entomology.ces.ncsu.edu/biological-control-information-center/beneficial-predators/dragonfly/

ADDITIONAL RESOURCES

COVID-19 Resources https://njaes.rutgers.edu/covid-19/
Community Gardening Series https://njaes.rutgers.edu/community-garden/
All 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/
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/

PEST MONITORING APPROACH FOR 2020

To help Community Gardeners identify and manage insect pests and diseases, a team of Rutgers Master Gardeners conducted weekly inspections in two Community Gardens during the 2018 and 2019 growing seasons. They wrote weekly reports on problems they observed including insect pests, diseases, and other issues.

Due to Covid-19 restrictions during 2020, the team is reporting on problems observed in their own vegetable garden plots rather than inspecting community gardens. One of the 2020 goals is to remain consistent in reporting any findings to benefit the New Jersey community gardeners, by maintaining some continuity in the gardening

season schedule and outcomes. Their plots are in six locations in Morris County including the Madison Community Garden, Morris Township ValleVue Community Garden, Morris County Community Garden, as well as home gardens in Denville, Morris Plains, Morris Township and Chatham Township.

An integrated pest management approach relies on a solid monitoring foundation. Prevention is also key. By scouting for pests and diseases, while employing mechanical, biological, cultural and chemical tools, the findings can be effectively evaluated allowing for best management practices

Report Editor: Jennifer Basile

Sightings reported by: Mary Albright, Mary Olin, Margot Sample, Jennifer Basile