UNIVERSITY OF MARYLAND EXTENSION

Greenhouse TPM/IPM Report

Central Maryland Research and Education Center
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From: Stanton Gill, Extension Specialist – IPM for Greenhouse and Nurseries, Central Maryland Research and Education Center, University of Maryland Extension
Karen Rane, Plant Pathologist, Director of the Plant Diagnostic Clinic, University of Maryland Extension
Andrew Ristvey, Extension Specialist, Wye Research and Education Center, University of Maryland Extension
Suzanne Klick, Technician, CMREC, University of Maryland Extension

New Invasive Thrips Found in Florida

By: Stanton Gill

The horticulture industry's worst group of pests are thrips. We have dealt with flower thrips, western flower thrips, onion thrips, and poinsettia thrips. Now we have a new invasive thrips found in Florida called *Thrips parvispinus* that has greenhouse growers worried. On March 28, the UF/IFAS Tropical Research and Education Center held an online training on this new thrips species. Since then, they have developed a web pages on this new species at https://mrec.ifas.ufl.edu/lsolab/thrips/thrips-parvispinus/

This thrips species is a polyphagous pest, reported feeding on at least 43 plant species from 19 families from different crop types. It heavily damages peppers, eggplants, and tomatoes, but also feeds on dahlias, nicotiana, and Gardenia. The worst part is it feeds on mandevilla and hibiscus which local stores import from Florida each spring.

This is one, very small thrips, slightly smaller than chili thrips and half the size of western flower thrips. It completes its life cycle in 13–14 days on a chili pepper under greenhouse conditions. It inserts its eggs into the leaves, and larvae hatch after four to five days. The larvae feed on leaves and flowers while completing two molts in four to five days. Afterward, larvae become pupae and two to three days the adult emerges. Currently, it is believed that they do pupate in the soil. Research is being conducted to determine what percentage of the population pupates in the soil. A female lays about 15 eggs and lives for nine days. Adult males live approximately six days.

Website to see female *Thrips parvispinus*: https://www.youtube.com/watch?v=lAfDJKmRbD4

Entompathogen Metarhizium – Back in the Marketplace

By: Stanton Gill

The artificially grown Metarhizum fungal spores are used as a natural pesticide. Years ago, we conducted trials using the entomopathogen, *Metarhizum anisopliae* when it was being manufactured by Novozyme Company and sold under the name Met-52. The material we tested in 2007 and 2008 worked well on thrips and spider mites in greenhouse environments. Then Novozyme took the product off the market in the last 3 or 4 years. It has reappeared, being manufactured for Danstar Ferment AG/Lallemand Plant Care of Milwaukee, Wisconsin.

There is a very limited amount being released onto the market until supplies can be increased. The fungi had a species name change from *Metarhizium anisopliae to the new species name Metarhizium brunneum, Strain F52. The product will be marketed under the name LALGuard M-52.*

Bacterial Leaf Blight of Begonia

By: Karen Rane, UMD Plant Diagnostic Lab

Anyone growing begonias should be watching for symptoms of bacterial leaf blight, a common and destructive disease affecting several types of begonia (Heimalis / Reiger, tuberous, Rex, and others). Symptoms of this disease begin as small dark spots and wedge-shaped blotches with somewhat irregular borders. Discoloration is often first observed around leaf margins (Fig. 1), with lesions expanding toward the base of the leaf. The lesions may appear watersoaked, and there may or may not be a yellowish margin to the lesions (Fig. 2). The bacterial pathogen responsible for this disease, *Xanthomonas axonopodis pv. begoniae*, can become systemic and move through the vascular system into petioles and stems, resulting in blighting and/or wilting of leaves and eventual plant collapse (Figure 3). The pathogen that infects begonia does not infect florist's geranium or other greenhouse crops.

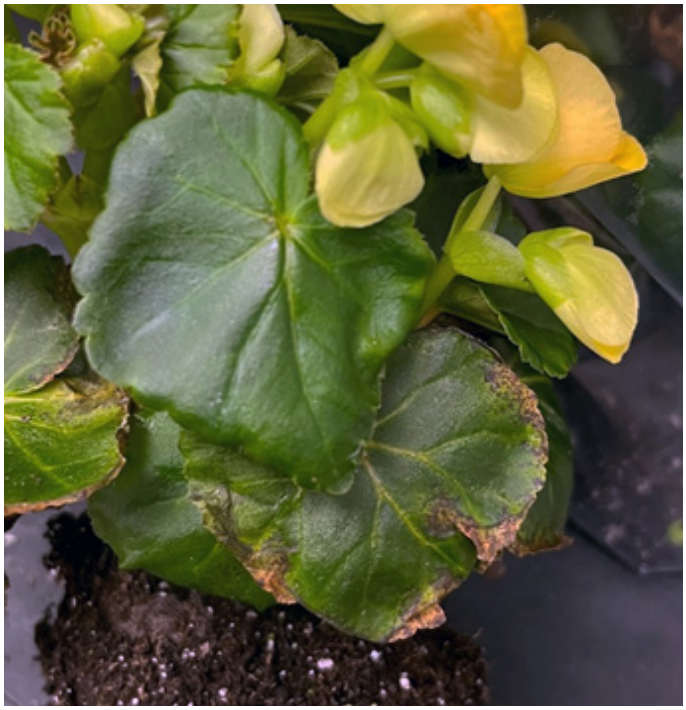


Fig. 1. Bacterial leaf blight of begonia, showing discolored areas of leaf margins with slight yellow borders.
Photo: K. Rane, UMD

Warm temperatures and leaf wetness favor infection and symptom development. At cooler temperatures, plants may be infected but symptom development is delayed. Overhead irrigation can splash-disperse this bacterial pathogen to adjacent plants.

Fig. 2. Closeup of begonia leaf with bacterial leaf blight.
Photo: K. Rane, UMD

Fig. 3. Begonia with severe symptoms of bacterial leaf blight.
Photo: K. Rane, UMD

Sanitation is key to disease management. Examine plants on arrival in the greenhouse, and discard those with symptoms. Scout the crop often to check for symptoms, and continue to rogue out symptomatic plants when first seen. Some growers will raise temperatures in a begonia greenhouse (80 F for 7-10 days, for example) to induce quicker symptom development and aid in identifying infected plants for disposal. Take steps to avoid spreading the disease through handling plants while roguing (such as using disposable gloves to handle plants with symptoms, and changing gloves before working with healthy plants). The pathogen can survive in dried leaf debris, so keeping benches and floors clean helps to reduce spread of the disease.

Practices that reduce leaf wetness will help reduce spread of this disease in the greenhouse. Drip irrigation, increased plant spacing and increasing air circulation can help make the environment less favorable for disease development. There is no cure for infected plants, but healthy plants may be protected by applications of copper products, or biological products like Cease (Bioworks).

Bulb Mites

Last month, we received Easter lilies that were infested with bulb mites. This week, the grower brought in gerberas that were also infested with bulb mites. Bulb mites are generalist feeders which can be found on a wide host range of plants. Bulb mites feeds on soft tissue. Keeping substrate on the dry side can help reduce the mites. *Stratiolaelaps scimitus* (formerly *Hypoaspis miles*) are mites used for biological control. If rot is in bulbs, the mites will spread the problem.

Bulb mites are feeding on the roots of gerbera.

Iron Efficient Plants and Low Substrate pH

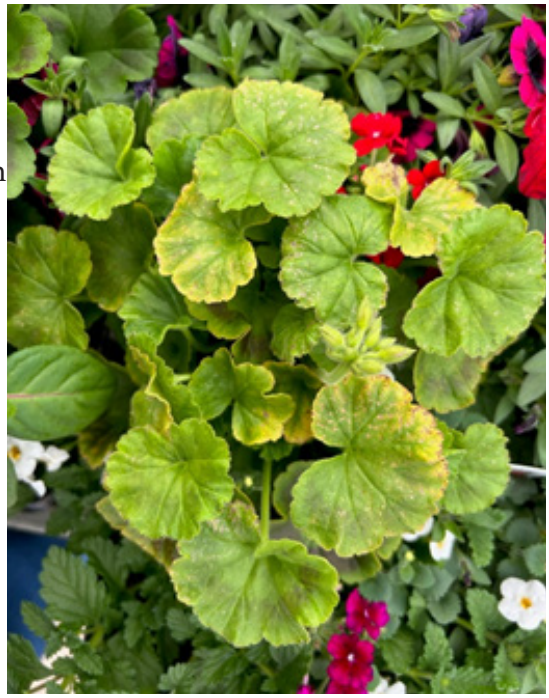
By: Andrew Ristvey

While most crops are tolerant of high iron availability in substrates there are many that are not. There are some plant species that are very efficient in acquiring iron. They have adapted to low iron environments by developing the ability to secrete organic acids from their roots to lower the rhizosphere pH and solubilizing nutrients, like iron. But this same adaptation can be problematic for potted plants if the substrate pH is below 6, causing iron and other micronutrients like manganese to become very soluble. Some of these iron-efficient plants include white and blue Salvia, zonal geraniums, some marigolds, Phox, Impatians, Gerbera, larkspur, alyssum, basil, and tomato, amongst others. These crops can exhibit true iron toxicity, even at normal iron levels because they are so efficient in iron assimilation. It is for this reason that when growing these crops in organic substrates, the pH should be kept between 6.3 and 6.5 which limits iron availability.

True iron toxicity shows up as a bronzing in the leaves and this coloration is due to the plant's creation of enzymes that control free-radicals like peroxides that develop when nutrients like iron and manganese become too available. Stippling is another common occurrence for both iron (Figure 1) and manganese toxicity (purple stippling).

Another potential cause of iron toxicity with these plants is the use of some iron chelates like DTPA and EDTA. Even at low concentrations of chelate, African marigolds showed iron toxicity symptoms because the plants had begun root zone acidification. Even after iron chelate was applied, the plant continued to acidify the root zone and too much iron ended up in the plant (Albano et al., 1996).

Be proactive and monitor the substrate pH of the sensitive crops with substrate extracts like a saturated media extract. If the substrate pH has already fallen below 6, it may be necessary to do a quick pH adjustment with a liquid lime product (calcium carbonates and oxides). To keep the pH from getting to that point, use fertilizers with at least 70% nitrate formulation. Also, get a water quality test and check for water alkalinity. Water alkalinity can be a factor in deciding what fertilizer nitrogen form to use.



A geranium with suspected iron toxicity. Substrate pH was 4.8. Photo credit: David Clement

Sometimes growers need to have two different fertility management programs between iron inefficient plants and iron efficient plants in the greenhouse. If a grower can walk the fine line of managing substrate pH, this may not be the case. Certainly, pH far outside the recommended range is immediately problematic. For instance, the geranium in this photo was in a substrate with a pH of 4.8. While the leaf tissues of this plant were not analyzed to confirm this, the plant is showing classic signs of iron toxicity. For more information, contact me at *aristvey@umd.edu.*

Aphids Are Active

We are receiving reports of aphids building up on perennial plants this week. Populations will continue to increase during the hot weather we are having now. Control options include Endeavor, Altus, and Aza-Direct. It's critical to catch a population before it builds and starts to produce winged alate stages which spread the population though your crop.

Cut Flower Education Seminar June 20, 2023

By: Stanton Gill

Our IPM team is setting up a one-day seminar for commercial cut flower growers on June 20, 2023. We have arranged to have speakers from The Botanical Trading Company, Syngenta Flower Division, Heartwood Nursery of Pennsylvania, and our IPM team with expertise in cut flower growing and problem solving.

This event will be held at Castlebridge Flower Farm in Ellicott City, MD. We will have information on how to register in upcoming IPM alerts later in the season.