

Commercial Horticulture

November 2, 2018

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IPMnet
Integrated Pest
Management for
Commercial Horticulture
extension.umd.edu/ipm

If you work for a commercial horticultural business in the area, you can report insect, disease, weed or cultural plant problems (**include location and insect stage**) found in the landscape or nursery to sklick@umd.edu

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Disease Information: Karen Rane (Plant Pathologist), David Clement (Extension Specialist), and Joe Roberts (Plant Pathologist for Turf)

Weed of the Week: Chuck Schuster (Extension Educator, Montgomery County)

Cultural Information: Ginny Rosenkranz (Extension Educator, Wicomico/Worcester/Somerset Counties)

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Last IPM Alert of the Season

By: Stanton Gill

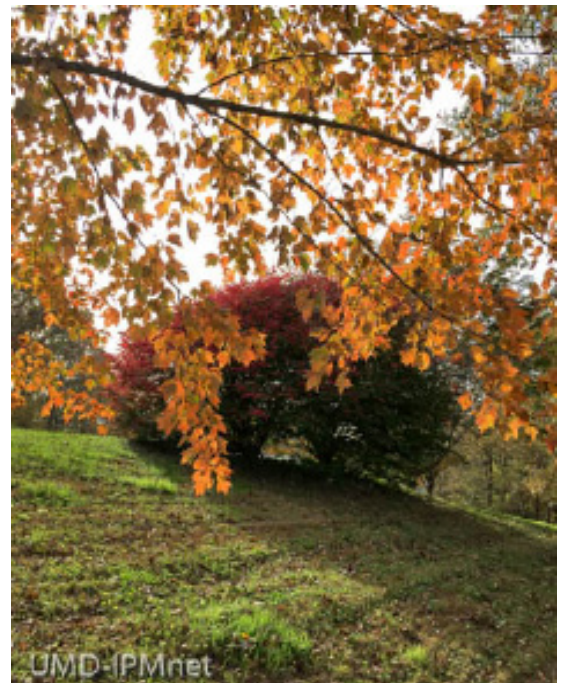
Well, it is time to end the season and put the regular IPM Alert to bed until March of 2019. All of our authors, Suzanne, and myself have enjoyed supplying you with updates each week in 2018. It has been a wild year of frequent and heavy rains and extreme cold in January and February of 2018. Let us hope 2019 weather is more cooperative.

We will send out periodic IPM Alerts on the seminars and special announcements this winter. Stay turned, and we will be back on a regular basis in March 2019.

IPM Report Survey - Help Us Out

By: Stanton Gill

Thank you to those of you who have filled out the IPM report survey. If you haven't done so yet, please follow the link in today's email.



Beneficial of the Week

By: Paula Shrewsbury, UMD

What do insects do to survive the winter?

We are not far from the onset of colder weather and winter which always starts me thinking about how beneficial and other insects are able to survive the freezing cold of winter. Insects are cold blooded animals and are strongly influence by the environmental temperature. The answer is “they do it in a diversity of ways”. Insects vary in the life stage in which they “overwinter”. They may overwinter as adults, pupae, immatures (larvae or nymphs), or eggs. For example, wheel bugs spend the winter in the egg stage (see image). Praying mantids are another predatory species that overwinter as eggs within the styrofoam-like oothecae that the female produces (see image). Lacewings (predators) overwinter in their larval stage and some species of butterflies (pollinators), wasps (predators), and bees (pollinators) overwinter as adults. There are multiple strategies used by various insects to get through the winter, some of which are physiological and others *behavioral* and some insects use a combination of both.

Some insects survive winter’s cold through a process called *supercooling*. Supercooling is when water cools below its freezing point without turning to ice. Insects use avoidance measures to avoid or stop the freezing of their bodies. Because insects are relatively small, their bodies contain little water so supercooling is not too much of an issue. As temperatures drop in autumn and early winter, many species of insects produce cryoprotectants, antifreeze-like compounds including glycerol and sorbitol, which prevent the formation of lethal ice crystals in bodies of overwintering insects. This “antifreeze” allows insects to survive even when ambient temperatures dip well below freezing. Woolly bear caterpillars and many of their relatives use this strategy.

Many insects will *diapause* (similar to hibernation in vertebrates) during the winter. Diapause is defined as an inactive stage of arrested development. Diapause results in the reduction of the insect’s metabolic rate to 1/10 or less its normal rate. This allows the insect to use its stored body fat to survive the cold winter and there is enough body fat because of the reduced metabolic demands. You may have noticed some insects aggressively feeding in the fall in an effort to store up on carbohydrates to help get them through the winter. In the spring, the onset of warmer temperatures will break or stop an insect’s diapause and they begin to develop at “normal” or seasonal rates. Other insects, such as the Mexican bean beetle, will develop and breed continuously throughout the year if conditions are favorable, but will “hibernate” as an adult for several months if exposed to low temperatures (37.4 °F or lower).



An ootheca (egg case) of the Chinese praying mantis that was found on the vine of bittersweet in the winter.
Photo: M.J. Raupp, UMD



Monarchs migrate south in the winter to escape the freezing temperatures of the north.
Photo: M.J. Raupp, UMD

Migration to warmer climates is a strategy some insects use to escape the freezing temperatures. Monarch butterflies are one of the most magnificent examples of a beneficial that migrates.

Other insects *tolerate* the cold by hiding in protected, warmer locations. Lady bird beetles move up to rocky outcroppings and hide among the rocks. Others, like the multi-colored Asian lady beetle, mistake homes and other structures for rocky outcroppings. Some beetles, like the overwintering white grubs of scarabs, burrow deeper in the soil to stay below the frost line and escape the freezing temperatures. Other insects hide in leaf litter, and under dead plant material or stones such as hawthorn lace bug, grasshoppers, and some butterflies. Others such as bark beetles and checkered beetles hide under bark flakes or in bark cracks of certain tree species. The nymphs of dragonflies and mayflies live in water of ponds and streams where they are active below any ice layer that forms. Other insects find completely dry locations to overwinter where ice crystallization cannot occur. Other insects completely empty their gut before they go into diapause to reduce the likelihood of ice crystallization.

Other factors that may influence overwintering survival of insects is how cold the temperatures get, fluctuations in temperatures and how rapidly they fluctuate, how long temperatures stay cold, and if there is snow cover or not.

The reasons insects, as a group, are so successful is their ability to adapt and evolve. So don't worry too much about beneficial insects. Insects have been surviving freezing temperatures for millions of years and have become very good at it.

Rose Rosette Disease

By: Stanton Gill

Frank Hale at the University of Tennessee Extension has been working on controlling mites that transmit rose rosette disease. I asked Frank if he would let us publish his comments in our IPM Alert this week and he agreed. Since so many of you have customers with Knockout and other bush type roses that have suffered from rose rosette, this information may help you.

From: Frank A. Hale, Ph.D., Professor, Horticultural Crops Entomology, University of Tennessee

We have been doing miticide tests in Tennessee over multiple years to see if we can control the eriophyid mite vector of rose rosette disease and thus stop transmission of the disease. Weekly miticide sprays were done in an earlier test. By year three of the test, all of the rose plants treated with Sevin, horticultural oil, Avid plus horticultural oil, and a water check were infected. Bifenthrin, Kontos, spiromesifen (JUDO/Forbid), and Akari 5 SC keep all the treated plants free of the disease for the length of the experiment (5 years). In 2016, we started a



At this time of year you should see wheel bug egg masses on the trunk of trees. Wheel bugs will spend the winter in its egg stage.
Photo: P.M. Shrewsbury, UMD



Some insects such as brown marmorated stink bug adults find protected locations to overwinter. Unfortunately, these locations are often homes or other structures.
Photo: P.M. Shrewsbury, UMD

new test where the foliar sprays are being made, every 2 weeks, 4 weeks and 6 weeks in the growing season using Akari, spiromesifen, Kontos, bifenthrin, Avid, and a water sprayed control. After just two growing seasons, the 2 and 4 week spray schedules are so far preventing infection while the 6 week spray schedule has had some roses become infected with rose rosette disease.”

For 2019, we want to look at a new test for field production roses. We will be looking at the four miticides that have been effective in our previous tests. We will be able to apply via drip irrigation (where applicable for products such as Kontos), spray application, or a combination of drip and spray. We are interesting in evaluating other compounds that are labeled for use on field grown rose plants. It would be preferable for suggested compounds to be supported with test data supporting a high degree of activity against eriophyid mites. We do want to come up with as many effective miticides as possible that can be used by rose growers now or in the near future.



Flowering Out of Normal Time

By: Stanton Gill

Steve Arrington, Sun Nurseries, sent in a photo of ‘Otto Luyken’ cherry laurel in full bloom this week in central, Maryland. There has been crazy weather this year and the blooming out of season continues. Spring of 2019 should be interesting since these plants bloomed this fall. So prepare your customers that spring of 2019 may show up with some plants failing to bloom.



‘Otto Luyken’ cherry laurels are blooming
Photo: Steve Arrington, Sun Nurseries

Deer Activity Remains

By: Stanton Gill

I was giving talks in Montgomery County on Thursday and I drove past 5 fresh roadkill deer. Obviously, their rutting and running around activity is continuing into this week. I think the deer have drawn a target mark on my family cars. Two weeks ago a doe took out my Prius to the tune \$8000 for repairs. On Monday, a deer ran into the side of my wife’s van taking out the headlight and side fender.

Be extremely careful when driving around dusk and early evening when most activity occurs. I started driving defensively behind someone else so they can take the hit instead of my cars.

Examining the Use of Actigard and Microbials for the Management of Foliar Bacterial Diseases of Tomato

By: Jerry Brust, UME

Two very bad foliar diseases of tomato are bacterial spot *Xanthomonas campestris* pv. *vesicatoria* and bacterial speck *Pseudomonas syringae* pv. *tomato*. I conducted a study looking at Actigard, fungicides+copper and microbial plant biostimulents for management of bacterial spot or speck in staked tomato. This study consisted of the tomato cultivar BHN 964 with 10 plants per rep, 4 reps arranged in a randomized complete block design.

The 4 treatments were: 1. Control (no fungicides or copper) 2. Fungicides+copper as recommended by the 2018 Mid-Atlantic commercial vegetable recommendations guide 3. Actigard + the recommended fungicide and copper sprays (this treatment will be referred to as the 'Actigard treatment') and 4. Microbial biostimulents. Actigard is a systemic compound containing the active ingredient acibenzolar-S-methyl. It elicits a mode of action in many plants (including tomato) that mimics the natural systemic activated resistance (SAR) response. The microbial



Fig. 1 Row on right had fungicides+Cu applied, row on left same fungicides+Cu plus Actigard applied.

Photo: Jerry Brust, UME

biostimulant (M-BS) cocktail I used is a concoction of my own that I came up with over the last few years of working with biostimulants. The M-BS cocktail consisted of mycorrhizae and *Trichoderma harzianum* strain t-22 both applied to the roots starting with plants in the greenhouse and every 2 weeks in the field. The foliar M-BS streptomycin spp and *Beauveria bassiana* strain GHA were applied every 2 weeks in the field starting ~2 weeks after transplanting. Disease ratings and marketable yield/plant (which includes culling unmarketable fruit from the harvest weight) were recorded and subjected to an analysis of variance and Tukey HSD mean separation test.

Results/Discussion: I normally average about 16 lbs of tomatoes per plant for a tomato trial, this year the average was 12 lbs/plant. This demonstrates the tremendous disease pressure that tomato plants experienced this season. In figure 1 on the right hand side are tomatoes that were treated with fungicides and copper. The row to the left was the Actigard treatment. You can see that the foliage of the Actigard treatment is in much better condition compared with the fungicide+copper treatment. Figure 2 shows the amount of foliage damage to tomato plants from bacterial spot infection in late August 2018. The control had the worse rating for bacterial spot and was significantly greater than

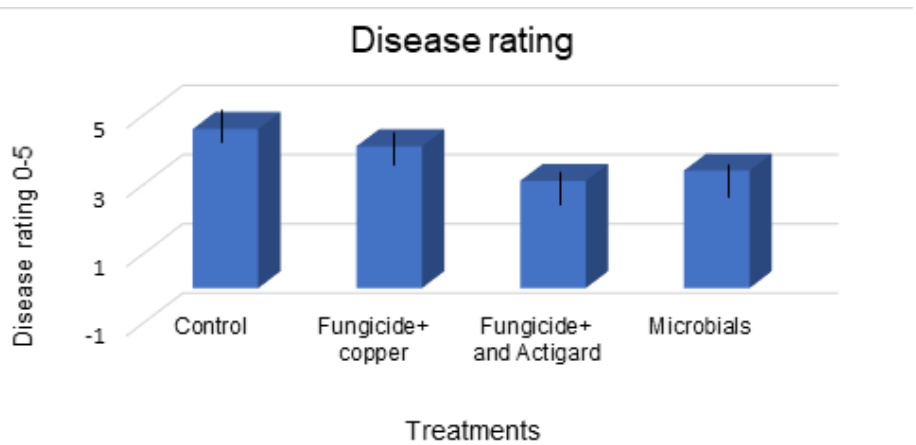


Fig. 2 Disease rating of tomato plants 0-5 with SE bars: 0=no disease; 1= 1-10% foliage diseased; 2= 11-20% foliage diseased; 3= 21-35% of foliage diseased; 4= 36-60% of foliage diseased; 5= >61% of foliage diseased.

the Actigard treatment or the M-BS treatment. The fungicide+copper spray treatments had only slightly reduced ratings for bacterial spot compared with the control. *Xanthomonas* spp have developed a tolerance for copper and it is not as effective of a control. For total marketable yields (fig. 3) the Actigard and M-BS treatments were significantly greater compared with the fungicide+copper and the control treatments. The fungicide+copper treatment did not significantly differ from the control in total marketable yields, but was numerically greater.

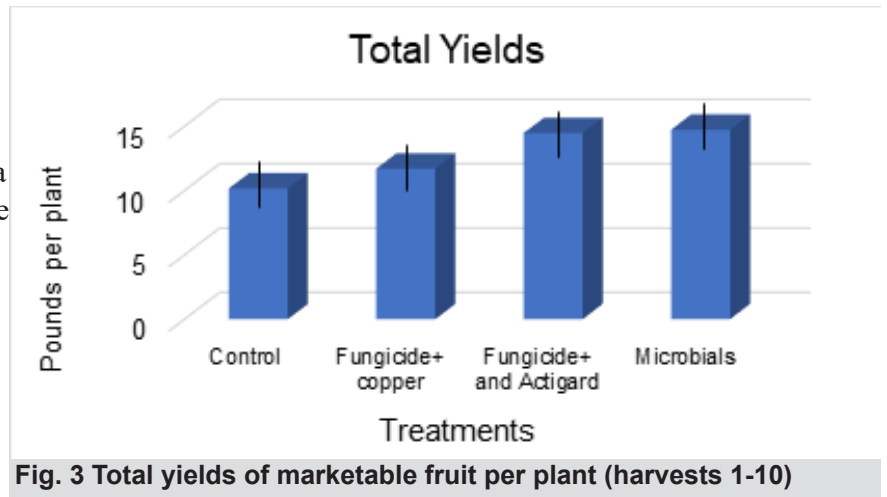


Fig. 3 Total yields of marketable fruit per plant (harvests 1-10)

Using Actigard this year in tomatoes significantly increased marketable tomato yields compared with just using a fungicide and copper spray program. Foliage was less infected by bacterial pathogens in the Actigard treatment and the plant was better able to produce unblemished fruit. The microbial biostimulants did very well in reducing the incidence of bacterial spot and increasing marketable yields. This is what biostimulants are supposed to do-help plants overcome stressful situations, in this case too much rain and disease, and improve the quality of the fruit. But my experience with them has shown that this outcome usually is not achieved or if it is, it is achieved by small increments and not significantly.

Spotted Lanternfly

As reported by MDA in [last week's report](#), there has been one report of an adult spotted lanternfly in Maryland. Monitor trunks closely for the hard-to-see egg masses and adults.



Spotted lanternfly egg masses blend in well with mottled gray-brown bark. This egg mass was found in Allentown, PA. Photo: Randy Schroeder, Naturalawn of America

Spreading Weed - Green Kyllinga

Mark Schlossberg, ProLawn Plus, Inc., is finding green kyllinga in lawns in the Baltimore area. He noted that it is likely going to “be a major problem in the next few years especially if we continue to have wet years”. Chuck Schuster, UME, covered it as a Weed of the Week in the [September 21, 2018 IPM Report](#). Chuck agreed, noting that with “soils staying wetter for longer periods, we will be seeing new weed issues emerge”.

Weed of the Week

By: Chuck Schuster, UME

Weed control with greater than average rainfall can be a challenge. The spring wet season created difficulty getting pre-emergent products on turf grass and getting it into the mulch beds. While the material, once applied, had the opportunity to dissolve and be activated, it may have been applied after germination of the weed seed and thus creating a so called failure. For crabgrass, products that were both pre-emergent and early post-emergent would have been the best choice, but unfortunately may not be as strong or work at all on Japanese stiltgrass. Products exist for post-emergent strategies, but often that was not part of the plan for the year. In landscapes, it was a slow spring for some getting mulch in place which results in late applications of herbicides. Moisture also created disease issues in turf for some, which lessened soil cover allowing later germinating crabgrass to get a foothold. Remembering that a good stand of turf helps shade the soil which prevents germination, because UV light is part of the needs for germination.

It might be a good year to consider different timing on applications for certain weeds. Japanese stiltgrass has reacted well to late winter, March timeframe applications with good to excellent results. As the timing of the seasons seem to be changing some years, consider the timetables we are using. Products that are used in turf are often applied with spring green-up nitrogen, but are also available with K_2O , and that may fit better into the plan that will provide the success needed to keep the undesired plants at bay. It has been a challenge for many this season. The higher than normal rainfall has affected every aspect of agriculture and horticulture. Now is a good time to plan for different options in the future.

Plant of the Week

By: Ginny Rosenkranz, UME

At the recent New Plants Conference that was sponsored by MNLGA and University of Maryland Extension, I listened to Scott Aker, the Supervisory Research Horticulturist at the U.S. National Arboretum, present a new idea on planning tropical perennial or temperennials, in place of typical annuals. Then, during his presentation, I saw a plant that I had found fascinating while visiting the Sarah Duke Gardens in South Carolina this past summer. The plant is *Solanum quitoense* 'Naranjilla' which is in the nighshade family with a common name of bed of nails. In its native countries of Peru, Ecuador and Colombia, it is grown for its fruit and its large tropical looking foliage that can spread 8 feet. The bright orange fruit can be eaten when fully ripe or made into a juice.



Here at the National Arboretum and the Sarah Duke Gardens, the plants were grown from seed and planted into the landscape, growing 2 – 2 ½ feet tall and about 3 feet wide. The alternately placed woolly leaves are soft green in color with deep purple veins and deep purple ½ inch spines on the veins and petioles, both on top and underside. The thick stems are covered with many more spines. The fragrant flowers have 5 white petals with 5 bright yellow stamens, while the unopened buds are also covered with purple spines. The fruit is covered with a brown hairy coat that can be rubbed off to reveal the smooth orange fruit. The plants are grown for the foliage here in the states for the tropical look – and the dark purple spines. Planting 'Naranjilla' with other purple or pink purple plants plays up the unusual spines that are best viewed from a distance. These plants will last all

summer and can be dug up (wear protective clothes, glasses and glove) by wrapping the plant up in newspaper to pot up and store in a heated greenhouse. In the spring once the temperatures are warm enough, replant the 'Naranjilla' in rich organic soils with excellent drainage. Pests can include rootknot nematodes, white peach scale, and bacterial wilt.



Solanum quitoense 'Naranjilla' has distinct purple spines on both leaves and stems
Photos: Ginny Rosenkranz, UME

CONFERENCES

Trees Matter Symposium

November 14, 2018

Location: Silver Spring Civic Center, Silver Spring, MD

[Registration Information](#)

Turf Nutrient Management Conference

December 6, 2018

Location: Carroll Community College, Westminster, MD

Information will be coming soon

Maryland Turfgrass Winter Conference and Trade Show

December 11, 2018

Location: Turf Valley Conference Center, Ellicott City, MD

[For more information](#)

December Pest Management Conference

December 18, 2018

Location: Carroll Community College, Westminster, MD

Space is limited

Advanced IPM PHC Short Course

January 7-10, 2019

Location: University of Maryland, College Park, MD

Contact: Amy Yaich, Admin. Assist. II, 301-405-3911

Email: umdentomology@umd.edu

Information: <https://landscapeipmphc.weebly.com/>

Mid-Atlantic Horticulture Short Course

January 15-17, 2019

Location: The Founders Inn, Virginia Beach, VA

FALCAN Conference

January 18, 2019

Location: Frederick Community College, Frederick, MD

MAA Winter Conference

January 22-23, 2019

Location: Turf Valley, Ellicott City, MD

Eastern Shore Pest Management Conference

February 6, 2019

Location: Fountains Conference Center, Salisbury, MD

Contact: Ginny Rosenkranz, 410-749-6141

LCA Winter Conference

February 14, 2019

Chesapeake Green Horticulture Symposium

February 20 - 21, 2019

Location: Maritime Institute, Linthicum Heights, MD

Manor View & The Perennial Farm Education Seminar

February 22, 2019

Location: Sheppard Pratt Conference Center, Towson

Institute of Applied Agriculture (IAA) Open House

The Institute of Applied Agriculture (IAA) offers a 60-credit certificate program within the College of Agriculture and Natural Resources. The IAA provides students with the entrepreneurial and technical skills needed to manage profitable agricultural enterprises. IAA will hold at Open House on Monday, November 12.

An RSVP is required. Register online at <https://iaa.umd.edu/iaa-open-house>.

Institute of Applied Agriculture Open House
Monday, November 12, 2018 from 9:30 a.m. - 12 p.m.
Room 1123, Jull Hall
University of Maryland, College Park Campus

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Photos are by Suzanne Klick or Stanton Gill unless stated otherwise.

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