UNIVERSITY OF MARYLAND EXTENSION

TPM/IPM Weekly Report

for Arborists, Landscape Managers & Nursery Managers

Commercial Horticulture **September 8, 2023**

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Leafcutter bees

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Plant of the Week: *Phlox paniculata*

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 sgill@umd.edu

Coordinator Weekly IPM Report:
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Regular Contributors:
Pest and Beneficial Insect Information: Stanton Gill and Paula Shrewsbury (Extension Specialists) and Nancy Harding, Faculty Research Assistant
Disease Information: Karen Rane (Plant Pathologist), David Clement (Extension Specialist) and Fereshteh Shahoveisi (Turf Pathologist)
Weed of the Week: Chuck Schuster (Retired Extension Educator), Kelly Nichols, Nathan Glenn, and Mark Townsend (UME Extension Educators)
Cultural Information: Ginny Rosenkranz (Extension Educator, Wicomico/Worcester/Somerset Counties)
Fertility Management: Andrew Ristvey (Extension Specialist, Wye Research & Education Center)
Design, Layout and Editing: Suzanne Klick (Technician, CMREC)

Magnolia Scale

Marty Adams, Bartlett Tree Experts, found female magnolia scale clustered in several pruning cuts on *Magnolia soulangeana*. Ants were present indicating that the females are increasing in size to produce eggs. The female are feeding more heavily and producing a lot of honeydew on which the ants feed.

Monitor magnolia scale (and also tuliptree scale) which produce crawlers in September into October. Use Talus or Distance when crawlers are active.

Magnolia scale on saucer magnolia. An ant is tending the scale insects that are secreting honeydew.
Photo: Marty Adams, Braltett Tree Experts

Maryland Department of Agriculture Confirms Beech Leaf Disease in Maryland

ANNAPOLIS, MD (September 7, 2023)-The Maryland Department of Agriculture has confirmed the presence of beech leaf disease and the associated nematode, *Litylenchus crenatae maccannii* in Harford County. Beech leaf disease is a new disease affecting all beech species including American beech (*Fagus grandifolia*). The disease has been found in surrounding states including Pennsylvania, Virginia, New Jersey, Ohio, Michigan, New York, Connecticut, Massachusetts, Rhode Island, New Hampshire, and Maine.

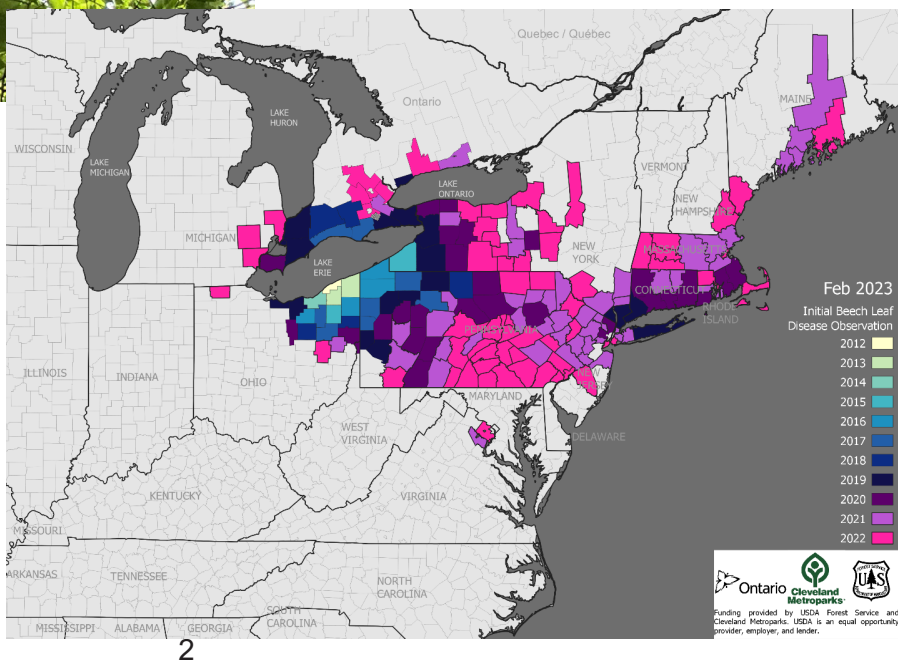
Beech Leaf Disease causes a dark banding or striping between the leaf veins. Trees with severe symptoms are heavily banded with yellowing, shrunken, and thickened leaves. The disease can kill understory trees in two years and mature trees in six to ten years. Treatments for are currently being researched.

"I applaud the department's Forest Pest team for their quick action on identifying this disease," said Maryland Department of Agriculture Secretary Kevin Atticks. "The team will continue to monitor and report the spread of Beech Leaf disease as it occurs. Homeowners are encouraged to do the same."

To report symptoms of Beech Leaf Disease data can be entered on the Tree Health Survey app (https://treehealthapp) or reported by email to fpm.mda@maryland.gov. For additional information visit the UMD Extension Website at: https://bit.ly/3Eny7eO. Additional Counties are being tested for presence of the BLD and the nematode. Permanent survey plots have been set up across Maryland since 2019.

Darking banding between leaf veins caused by beech leaf disease (left). Photo from MDA.

Distribution map of beech leaf disease (below) provided by USDA, Cleveland Metroparks



Don’t Let Your Guard Down for Fall Powdery Mildew Infections

By: David L. Clement and Karen K. Rane

Powdery mildew on magnolia in late August. Photo: Suzanne Klick, UME

Just a reminder that if our fall weather breaks in the next couple of days and we get rain, or our humidity levels increase back to normal we may see outbreaks of powdery mildew infection. We may even get a hurricane thrown into our weather pattern. Who can predict?

There are many kinds of powdery mildew fungi, and some are general pathogens while others are highly specialized. Powdery mildews are favored by warm days and cool nights and moderate temperatures (60° to 86°F). These conditions usually continue through mid-October in the Maryland/Washington D.C. area. Shady sites as well as high relative humidity also favor powdery mildew fungi.

As a general rule late season powdery mildew infection in landscapes won’t have much of a detrimental effect on woody plants. Prune out heavily infected landscape herbaceous perennial foliage this fall to lessen disease pressure next season. Fall management of powdery mildew in nurseries will decrease disease pressure for next season. Keep in mind that you should apply early powdery mildew protection on susceptible cultivars of dogwood, crape myrtles, roses, and crabapples next spring.

Heat and Drought – Double Whammy

By: Stanton Gill

It is going on the fourteenth week of drought for much of Central Maryland. On Tuesday, it reached 99 °F with a heat index of 101 °F. For Wednesday and Thursday, it was in the high 90 °F range. We are seeing more and more trees dropping scorched foliage beneath their canopies. River birches look terrible, and many cherry trees are defoliating. Regular scorch on oaks combined with bacterial leaf scorch is making a mess of oaks this summer.

I have talked with several wholesale greenhouse operations. Many have moved their mums into the marketplace, but customers just are not buying. Likely, their ground is too hard and dry to put in fall mums. Let’s hope for some REAL, SIGNIFICANT rain.

Impacts of Extended Drought

By: Stanton Gill

Stressed trees produce ethyl alcohol. The 14-week drought has had plenty of time to stress the heck out of plant material. I put out a notice asking growers to let me know if they were seeing ambrosia beetle activity this late in the season. I received a call Thursday morning from a nursery in Bucks County, PA reporting sugar maples were being heavily infested with ambrosia beetles.

Check for the early signs – wet areas on trunks and small piles of sawdust on the trunk. Bifenthrin applied as a trunk application is good protection for about 14 -18 days.

European Hornet Activity

By: Suzanne Klick, UME

Early last week, there was a dead black swallowtail caterpillar on the bronze fennel growing here at the research farm. On Friday, September 1st around noon, a European hornet found it. It took a little over 15 minutes for the hornet to prep the caterpillar and make a somewhat rounded 'package' so it could take the food back to its nest.

With the dry weather, European hornets are clustering on stems and stripping the bark of buddleia to feed on the sap. These hornets also strip bark that they add to their nests. They have a painful sting, but usually are not aggressive unless defending their nests. They damage a wide variety of woody trees and shrubs. Commonly damaged plants include lilac, boxwood, viburnum, fruit trees, birch, willow, poplar, rhododendron, and dogwood.

A European hornet prepping a black swallowtail caterpillar for transport to her nest.
Photo: Suzanne Klick, UME

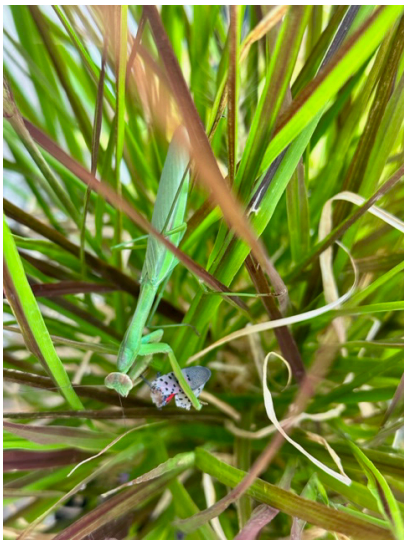
European hornet taking of with 'packaged' black swallowtail caterpillar.
Photos: Suzanne Klick, UME

European hornets feeding on sap on a buddleia stem.
Photo: Suzanne Klick, UME

Success with Trials on Spotted Lanternfly

By: Stanton Gill

Life is an adventure and we have had an adventure with spotted lanternfly this spring and summer. Brian Kunkel, University of Delaware, Suzanne Klick, Sheena O'Donnell, Nancy Rechigl (Syngenta), Jane Stanley (EnVu), and I have been setting up five different spotted lanternfly trials at nurseries this summer. Our success rate has been less than stellar for 4 of these trials. Two of the trials were using drones to apply the materials. For the other three trials, we applied materials using controlled pressure sprayers with fine mists. Spotted lanternfly nymphs and adults do not do well holding up in large netted areas even with tender loving care. We consulted several researchers in PA and got varying ideas on how best to keep the SLF alive in trial, especially the control bugs. We have obtained good levels of kill with the entomopathogens and systemic chemicals we are testing, but when all of our controls die, it is impossible to run statistics on the results.



A Chinese praying mantid feeding on a spotted lanternfly. Photo: Sharon Bollinger

Brian and I want to thank Ed Snodgrass, Emory Knoll Farms, and Alan Jones and Will Behner of Manor View Nursery for working with our team providing sites for the trials. Also, thanks all you have helped us with finding sites for SLF. Mark Schlossberg of ProLawn Plus, Inc., found us several of his customers with sites with heavy infestations of spotted lanternflies to collect for the last few trials. Sheena and I managed to have our hair covered with honeydew when collecting under heavily infested Ailanthus trees. It looked like glittering rain with all of the honeydew coming off the infested trees. Suzanne, Sheena, Brian, and I all learned the skill of capturing an insect that is extremely "jumpy" and takes off at the slightest provocation.

Last week, on our fifth trial for the season, we finally had success with all of the treatments and the control plant populations remained alive so we finally have something on which to run stats. We will share the results of the trials during winter educational conferences.

From our collecting of SLF, I can comment that parts of Baltimore County are right on the edge of explosive populations with 2024 probably being a banner year for this insect. Parts of Carroll County are just getting going this year and likely have at least two years until it really takes off. Parts of Harford County where we have been conducting trials over the last 3 years saw the populations really decline as parasitoids and predators knocked down the populations after 3 years of steady increase.

Deer Are Active

Elaine Menegon, Good's Tree and Lawn Care, found deer damage on arborvitae in Hershey, PA this week. Also be on the lookout for deer along roadsides to avoid a collision.

Deer damage on arborvitae
Photo: Elaine Menegon, Good's Tree and Lawn Care

Camphor Beetle Activity

By: Stanton Gill

Emily Mueller, Capitol Grounds IPM Coordinator, reports camphor beetle activity in Washington, D.C. Here is her email on camphor beetles: "Regarding camphor beetles, we have a high population in very stressed red and sugar maples at our House Upper Garage Parks. Two maples were removed this year that had high numbers of *Cnestus mutilatus* (confirmed by USFS - Larcenaire, Craig)."

Undersized and Cracking Pawpaw Fruit

By: Stanton Gill

Pawpaw trees love water and this drought is tough on them. I have been irrigating my pawpaw trees with slow watering and high quantities 3 - 4 times a week for the last 6 weeks just to keep them hydrated and the fruit swelling.

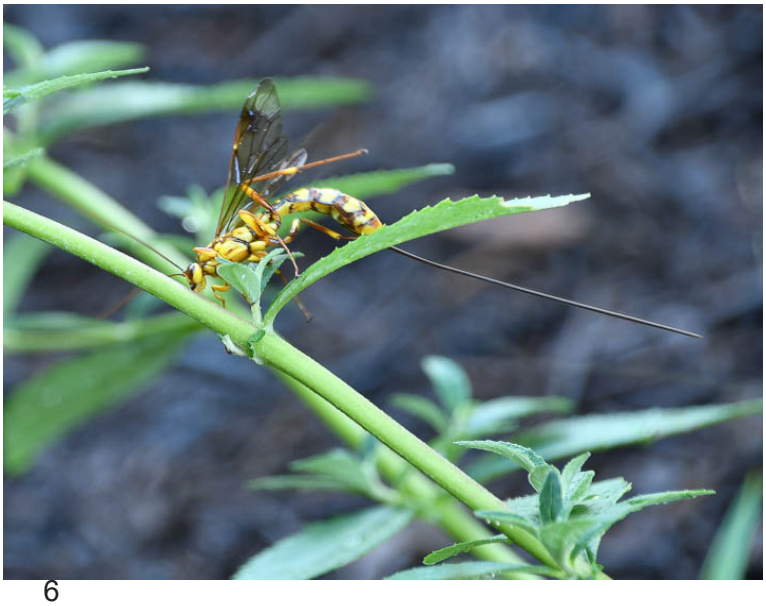
David Keane sent in these photos of his pawpaw fruit. They are cracking and undersized. He is watering once a week, but this is just not enough in an extended drought with bright sunny days that pull out a huge amount of water from a plant. There are also saprophytic fungi growing on the skin of his fruit. If you are growing pawpaws, it may be a little late, but keep them well watered every couple of days if you want to swell the fruit.

Figs love this heat and are finally ripening in central Maryland this week. The predicted rain for this weekend may cause figs to crack as the ripe fruit gets a big dose of water.

Cracking pawpaw fruit due to too little water; saprophytic fungi is also growing on the skin.
Photo: David Keane

Ichneumonid Wasp

Dave Freeman, Oaktree Property Care, found an ichneumonid wasp, likely a *Megharhyssa* species, in Fairfax, VA this week. Ichneumonidae is the largest family within the order Hymenoptera Paula Shrewsbury, UMD, covered this wasp genus in the September 9, 2022 IPM Report.



Note the extremely long ovipositor on this ichneumonid wasp.
Photo: Dave Freeman, Oaktree Property Care

Argiope Spiders

Ginny Rosenkranz found a female yellow and black garden argiope spider on the Eastern Shore this week. As we move into fall, look for yellow and black argiope garden spiders. They are mating now, and females are laying eggs in egg sacs that are about an inch in diameter. Males are about 1/3 the size of females. The zigzag pattern in the web is called a stabilimentum. Its purpose is still unknown.

They feed mainly on insects so they help keep pest insect populations down. The eggs hatch in late summer into fall. The recently hatched spiders that do not fall victim to predators and parasites emerge from the egg cases next spring. There is only one generation per year.

A female black and yellow argiope garden spider.
Photo: Ginny Rosenkranz, UME

Left to right: An egg sac, a male, and a female black and yellow argiope garden spider.
Photo: Suzanne Klick, UME

Beneficial of the Week

By: Madeline Potter and Paula Shrewsbury

Leafcutter bees: Leaves are important for some pollinators

Have you ever come across a leaf with discrete, circular cut outs along the leaf's edge and wondered- *what created those?* The cut outs were likely created by leafcutter bees (see image), which are a common group of solitary bees in the family Megachilidae. At least 20 species of leafcutter bees, from several genera, have been documented in Maryland. Leafcutter bees are beneficial insects in our ecosystems, pollinating wildflowers, fruits, vegetables, and other crops such as legumes. Some native leafcutter bees (*Osmia* spp.) are commercially available and used to pollinate crops like alfalfa and blueberries. Female leafcutter bees collect and transfer pollen from flowers through a pollen-carrying structure, called scopa, which are hairs on the underside of their abdomens (see image). Leafcutter bees are not only known as pollinators but also architects which utilize natural materials such as leaves and flower petals to construct protective chambers for their young. A female leafcutter bee locates a preexisting cavity in pithy plant stems, rotting or soft wood, or empty tunnels, ensuring the hole is long and wide enough. Once a leafcutter bee has located a cavity, she will create chambers to lay her eggs in, also known as brood cells, lined with circular and/or oval leaf and petal cut outs, resulting in a cigar-like structure in the cavity (see image). Common plants used by leafcutter bees for leaf and/or petal material include roses, serviceberries, redbuds, and azaleas, although other plants also may be used. Leafcutter bees use their sharp mandibles to cut circular pieces of leaf from leaves to line their chambers. It is suspected that these bees are able to exploit antimicrobial effects of certain compounds in plant materials, indirectly using them to protect their young during their development. The leafcutter bee will include a ball of pollen and nectar in each chamber so there is food for the immature/larval bees when the eggs hatch. Female bees can craft multiple chambers per a

Leafcutter bee adult, *Megachile* sp., on a common milkweed (*Asclepias syriaca*) flower. Note the yellow-orange pollen collected on the hairs (scopa) on the underside of the abdomen.
Photo by Pcowartrickmanphoto (CC BY-NC 4.0), iNaturalist.org. https://www.inaturalist.org/observations/83711128

Leafcutter bee tubes found in an old log showing the plant leaf lined tubes consisting of several brood cells/chambers.
Photo: M.J. Raupp, UMD

cavity by creating a leaf wall/cap between chambers. Each individual chamber contains one pollen ball and one bee egg. The cozy chambers will protect the young bees throughout the winter time. Come spring, the new adult leafcutter bees will chew their way out of their chambers and cavity. A lot of work goes into raising these ecologically important leafcutter bees.

Not all leafcutter bee species create leaf cut outs, as some species use other materials like resin and/or mud to create their chambers. Leafcutter bees are also frequent users of human made bee or insect hotels, where holes/cavities are provided. Leaf cutter bees are not aggressive or territorial and will only sting if handled. Beyond pollination, leafcutter bees are also valuable hosts and food sources for parasitic wasps, flies and beetles, birds, mammals, reptiles, and amphibians.

Rose leaves showing the characteristic circular leaf cut outs caused by leafcutter bees. The leaf circles are used to line the brood chamber made by the females.
Photo by M.J. Raupp, UMD

When spotting any leaf damage from leafcutter bees, note that this damage is cosmetic and rarely significantly impacts plant health. One can utilize physical barriers such as cheesecloth to protect specific plants, if needed. The circular leaf cut outs are a unique reminder that many of our beneficial insects require plant materials to survive and reproduce. If we want to conserve and support beneficial insects and their services, such as leaf cutter bees and their pollination services, tolerance of some damage is needed. Consider the leaves a donation to a worthy beneficial insect.

Weed of the Week

By: Nathan Glenn, UME-Howard County

Shepherd's-purse, *Capsella bursa-pastoris,* is an invasive winter annual weed in the Mustard family that is native to southern Europe. Today, it can be found in lawns, pastures, gardens, and small grains throughout the United States. The seedpods of Shepherd's-purse have been used to add a pepper spice to meals such as stir-fry and salads. German soldiers during World War II relied on Shepherd's-purse as a medical treatment (https://www.bbg.org/article/weed_of_the_month_shepherds_purse).

Shepherd's purse is an invasive winter annual
Photo 1: From PLU NCSI with permission.

As temperatures start to cool off, winter annuals such as this one will begin to germinate before over wintering and dying in the spring/early summer. For now, it may be difficult to find anything growing well with the droughty weather we are experiencing, but keep an eye out for germinating

Shepherd's-purse in the next couple months. Growing from a ground hugging four-inch basal rosette to a tall twenty-five inches in total height. A Shepherds-purse seedling may be mistaken as curly dock, but curly dock's leaf margins remain entire (instead of lobed) as the leaf matures. Its rosette has leaves that are lance-shaped and up to two and a half inches in length. The root system is a taproot (photo 3). A slender upright stem is produced as weather warms the following spring. The leaves are alternate, and clasping, lance-shaped, narrow and toothed. The white to pink flowers (photo 2) have four petals and are found on thin spreading stalks that produce heart-shaped flat seed pods (photo 4). Each pod can contain up to twenty seeds. Shepherd's-purse reproduces only by seed. Seeds require disturbance for germination and will survive long periods in the soil. This plant prefers dryer climates but can survive on wet sites. The name for this weed comes from the small flat seeds that are produced, triangular in shape, with a seam in the middle.

Close-up of shepherd's purse flower
Photo 2: C. Schuster, UME

Cultural control in turfgrass includes mowing at the appropriate height, maintaining optimum pH and fertility levels, and encourage a dense turf. Strong turf is an excellent deterrent to this weed. In landscape settings the use of mulch, other barriers, and mechanical hand removal or flame control is effective. Flaming is not advised in extremely dry conditions.

Shepherd's-purse will respond to spot treatments of liquid, selective, post emergent, broadleaf week killer if applied while weeds are actively growing. Products with one or more of the following active ingredients will be effective: 2, 4-D, MCPP (mecoprop), Dicamba, or Triclopyr. Make sure not to spray herbicides containing dicamba over the roots of trees and shrubs.

Shepherd's purse root system
Photo 3: C. Schuster UME

Shepherd's purse seed head
Photo 4: C. Schuster UME

Plant of the Week

By: Ginny Rosenkranz

Phlox paniculata or garden phlox or summer phlox because these tall summer beauties fill up the gardens with fragrance and color during the high summer, and are very different from the ground cover, spring blooming *Phlox subulata* or moss phlox. Garden phlox is cold hardy in USDA zones 3-8 and can grow as tall as 2-5 feet tall and 1-3 feet wide. It is a clump forming herbaceous perennial that has cultivar flowers in shades of lavender, purple, pink, rose, red, orange, bi-colors and white, and pares well with other native summer blooming flowers. Plants grow best in full sun and prefer moist but well drained, rich organic soil and good air circulation to reduce powdery mildew. *P. paniculata* 'David' was found as a seedling among native phlox, and was chosen for its pure white flowers and its strong resistance to powdery mildew. The fragrant, pure white tubular flowers have 5 flat petal-like lobes that expand from ½ inch to 1 full inch in diameter. The flowers are layered in a dense domed cluster 6-8 inches long at the top of the upright stiff stems. The flowers bloom from July to September, and thrive when the spent flowers are trimmed off. The tubular blooms are visited by humming birds, many butterflies and other pollinators, adding to the garden experience. Deep green 4-6 inch long, 1-3 inch wide elliptical leaves have an entire margin and arrange themselves opposite of each other up the stems. Each leaf

has strong veins that branch from the center mid vein, then curve upward toward the tips, connecting with the next vein closer to the top of the leaf and forms what can look like a vein along the edge of the leaf. Garden phlox thrives in perennial borders, native, pollinator and rain gardens. Although ‘David’ is powdery mildew resistant, the Phlox pests include Phlox bugs, spider mite in hot, dry weather, powdery mildew and root rot. If the deer population is healthy, the phlox often get trimmed down until other edible crops emerge.

Phlox 'David' blooms from July to September. Photo: Ginny Rosenkranz, UME

Degree Days (as of September 6)

Abingdon (C1620)	3124
Annapolis Naval Academy (KNAK)	3383
Baltimore, MD (KBWI)	3441
College Park (KCGS)	3291
Dulles Airport (KIAD)	3348
Ft. Belvoir, VA (KDA)	3173
Frederick (KFDK)	3193
Gaithersburg (KGAI)	3038
Gambrils (F2488, near Bowie)	3231
Greater Cumberland Reg (KCBE)	2868
Perry Hall (C0608)	3031
Martinsburg, WV (KMRB)	2599
Natl Arboretum/Reagan Natl (KDCA)	3743
Salisbury/Ocean City (KSBY)	3353
St. Mary’s City (Patuxent NRB KNHK)	3788
Westminster (KDMW)	3461

Important Note: We are using the Online Phenology and Degree-Day Models site. Use the following information to calculate GDD for your site: Select your location from the map Model Category: All models Select Degree-day calculatorThresholds in: Fahrenheit °F Lower: 50 Upper: 95 Calculation type: simple average/growing dds Start: Jan 1

Pest Predictive Calendar "Predictions"

By: Nancy Harding and Paula Shrewsbury, UMD

In the Maryland area, the accumulated growing degree days (**DD**) this week range from about **2599 DD** (Martinsburg, WV) to **3788 DD** (St. Mary's City). The Pest Predictive Calendar tells us when susceptible stages of pest insects are active based on their DD. Therefore, this week you should be monitoring for the following pests. The estimated start degree days of the targeted life stage are in parentheses.

Japanese maple scale – egg hatch / crawler 2nd gen **(2508 DD)**
Fern scale – egg hatch / crawler 2nd gen **(2813 DD)**
White prunicola scale – egg hatch / crawler 3rd gen **(3238 DD)**
Banded Ash clearwing borer – adult emergence **(3357 DD)**
Tuliptree scale – egg hatch / crawler **(3472 DD)**

See the Pest Predictive Calendar for more information on DD and plant phenological indicators (PPI) to help you better monitor and manage these pests.

Conferences: Go to the IPMnet Conference Page for links and details on these programs.

September 13, 2023
MAA's Day of Safety and Health
Locatiaon: Howard County Fairgrounds, West Friendship, MD
Registration info: https://safetyandhealth23.eventbrite.com/

September 13, 2023
MNLGA Nursery Field Day
Location: Abby Farms, Waldorf, MD
Registration is now open

October 11, 2023
FALCAN Truck and Trailer Seminar
Location: Urbana Fire Hall, Urbana, MD
Details and Registration Info

2024 Advanced Landscape IPM PHC Short Course
This is a recertification short course for arborists, landscapers, IPM consultants, horticulturalists, professional gardeners, and others responsible for urban plant management. The course lectures will be held over four days at the University of Maryland, College Park, MD. In addition, there will be a hands-on lab following lecture (available to a limited number of course attendees).
Coordinators: Drs. Paula Shrewsbury and Mike Raupp, Dept. of Entomology, University of Maryland

Lecture dates: Monday, January 8 - Thursday, January 11, 2024 from 8:00 am – 3:00 pm
Lab dates: Monday, January 8 - Thursday, January 11, 2024 (space limited) from 3:30 pm – 5:30 pm
Course and registration information: https://landscapeipmphc.weebly.com/
Questions contact: Amy Yaich, 301-405-3911, umdentomology@umd.edu

Natural Area Management Services:
Expanding Business Opportunities for Green Industry Professionals

October 3, 10, & 17, 2023; 6:30-8:30 p.m.

Are you a Green Industry professional interested in expanding the suite of services offered to your clients to include creating and enhancing woodlands and meadows? If so, join this three-part webinar series Tuesday nights, October 3, 10 and 17, from 6:30-8:30 p.m., and learn about expanding Natural Area Management Services to your clientele. Cost is $50 for three webinars and you will earn a variety of recertification credits.

Developed by The Woods in Your Backyard Partnership, this program aims to inform and equip landscapers, arborists, landscape architects, horticulturalists, land managers, foresters, and other green industry professionals with knowledge and skills to provide additional services to clientele while improving ecosystem health. Small-scale Natural Area Management Services include wildlife habitat enhancement, forestry practices such as reforestation, invasive control, and more. A resource manual and specialized checklist tool complement the training and help Green Industry professionals determine which enhancement practices suit a given property.

This 3-part series provides in-depth instruction related to the management of a small-acreage property from start to finish through our case-study scenario. We start with an assessment of the client's property with a standard checklist and proceed with plan development, and finish with the implementation of various land care practices, creating wildlife habitat, managing invasive plants, tree planting, and reforesting a property. This series will increase your knowledge and skills so you can gain an edge over the competition and grow your business. Each participant will receive a copy of the Woodland Health Practices Field Guide, a $7.50 value.

All “live” session attendees receive a certificate of attendance to obtain professional development credits. Continuing Education Units approvals are pending for: Maryland Tree Experts, International Society of Arboriculture (ISA); Chesapeake Bay Landscape Professionals (CBLP); Landscape Architects; PLNA Certified Horticulturalist; VNLA Certified Horticulturalist; and Society of American Foresters.

Register by September 25 and receive the link to access the webinar. Registrants will also receive access to the webinar recordings. Go to: https://extension.psu.edu/natural-areas-management-services-expanding-business-opportunities-for-green-industry-professionals. Please share with others.

This webinar series is provided by The Woods in Your Backyard Partnership; a collaboration of the University of Maryland Extension, Penn State Extension, Virginia Cooperative Extension, Virginia Department of Forestry, the Alliance for the Chesapeake Bay/Forests for the Bay, Maryland Department of Natural Resources Forest Service

Commercial Ornamental IPM Information
extension.umd.edu/ipm

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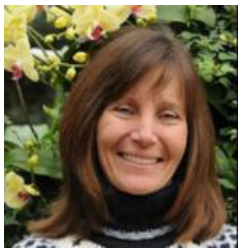

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Photos are by Suzanne Klick or Stanton Gill unless stated otherwise.