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**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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Armillaria Root Rot

By: D.L. Clement

Armillaria root rot, frequently referred to as shoestring root rot, is one of the most persistent and destructive fungal pathogens affecting woody plants, conifers, and broadleaf trees worldwide. Caused by various species within the genus *Armillaria*, this pathogen acts as both a saprophyte—decomposing dead organic matter in soils, and an aggressive parasite capable of invading and killing living trees.

Armillaria can persist for decades as a saprophyte inside buried stumps, major root systems, and woody debris. It survives underground by producing distinctive dark brown or black, root-like threads known as rhizomorphs.

These "shoestring" structures extend outward through the soil, bridging the gap between an established food base, such as an old stump, and the healthy root systems of adjacent living trees. When these rhizomorphs reach a host, the fungus secretes digestive enzymes that break down the bark and target the vascular cambium, the vital tissue responsible for generating new water, and nutrient-transporting layers.

Once inside the host, *Armillaria* effectively girdles the root collar and lower trunk, restricting the flow of nutrients between the roots and canopy. Above-ground symptoms often are confused with general drought stress or nutrient deficiency. Trees may display sparse, undersized foliage, premature chlorosis

(yellowing), dieback in the upper crown, and an abnormal increase in seed or cone production before entering a rapid or prolonged decline. Peeling back the bark at the soil line reveals definitive diagnostic signs that appear as white fan-shaped fungal mats (mycelial fans) pressed tightly against the wood. In the autumn, clusters of honey-colored, gilled mushrooms frequently emerge around the base of severely infected trees or rotting stumps that release spores that can further colonize wounded or dead wood.

Armillaria is fully capable of attacking vigorous, healthy trees under high inoculum pressure however, the greatest rates of mortality consistently occur in trees compromised by environmental stress. Factors such as prolonged drought, soil compaction, root damage from construction or landscaping equipment, and repeated defoliation by insects weaken a tree's natural defense mechanisms. Vigorous trees can often compartmentalize minor infections and slow the advance of the fungus, whereas stressed plants succumb rapidly.

Management

There are no effective, registered post-infection chemical fungicides available for established landscape trees. Consequently, control strategies should emphasize prevention and cultural management. Landscapers should minimize environmental stresses such as drought stress, through irrigation during dry spells, avoid mechanical injury to the root flare, and ensure adequate soil drainage. When replanting in landscapes where trees have died from *Armillaria* infection it is recommended to remove all old stumps and large root fragments to reduce the primary inoculum load.



***Armillaria* at the base (top photo) of a tree and a close-up of the white gills underneath the cap (bottom photo).**

Photos: Suzanne Klick, UME

Box Tree Moth Hits Another County

By: Laura Nixon

As of last week, Maryland Department of Agriculture has expanded the box tree moth (BTM) (*Cydalima perspectalis*) quarantine to include Harford County, MD. This is the 6th county that BTM has been confirmed in (Washington, Cecil, Queen Anne's, Kent, and Caroline), and the 9th to be quarantined. In the [August 28, 2026 report](#), we published some guidance on how to prepare for quarantine and compliance agreements; also see the [MDA quarantine announcement](#) for additional information.

At our scouting sites in Washington County, we are seeing predominantly early instar caterpillars, and they are beginning to form overwintering structures by silking together boxwood leaves. Many of these caterpillars are too small to overwinter yet so will continue to feed and develop inside these structures for now.



Webbed together leaves (left) open up to reveal a small box tree moth caterpillar still feeding (right).
Photo: Laura Nixon, UME

First Spotted Lanternfly Egg Sighting

By: Laura Nixon

Last week, we advised folks to be on the lookout for spotted lanternfly (*Lycorma delicatula*) egg laying, and this week we got our first report. Donald Redmiles captured some great photos of a female depositing her eggs on a Freeman maple in Chestertown (Kent Co.) earlier this week. Later in the week, Suzanne and I saw egg masses on the underside of a fabric structure we had deployed a few weeks ago in Frederick County. Spotted lanternfly will deposit their eggs on any stationary structure, and commonly on the underside of structures or branches, so be mindful to look underneath when scouting!



A female spotted lanternfly actively depositing her eggs on a maple tree trunk.
Photo: Donald Redmiles (Tideland Gardens).



Spotted lanternfly lay their eggs in rows. Sometimes, when disturbed, they will not cover the eggs with their distinctive waxy coating, these eggs are still viable.
Photo: Donald Redmiles (Tideland Gardens).



Spotted lanternfly will lay their eggs on human-made structures.
Photo: Laura Nixon, UME

Syrphid Fly Larvae

By: Laura Nixon

Syrphid flies, commonly called hoverflies or bee mimics, are important pollinators in our landscapes. They are completely harmless and feed on pollen and nectar. However, their larvae are active predators of other insects. Syrphid fly larvae can be mistaken for caterpillars or referred to as “worms”. These legless predators are most likely to be devouring colonies of aphids, but will feed on other small, soft bodied pests, such as soft scale, mealybugs, or thrips. This week, we saw a pair of syrphid fly larvae on a crape myrtle which was heavily infested with both crapemyrtle aphids and crapemyrtle bark scale, a veritable buffet!



Syrphid fly larva on a crapemyrtle. This larva was amongst a lot of mess left by various pests, so it is hard to tell what it was hunting!
Photo: Laura Nixon, UME



Microscope picture of the syrphid fly larva collected from crape myrtle with a scale population.

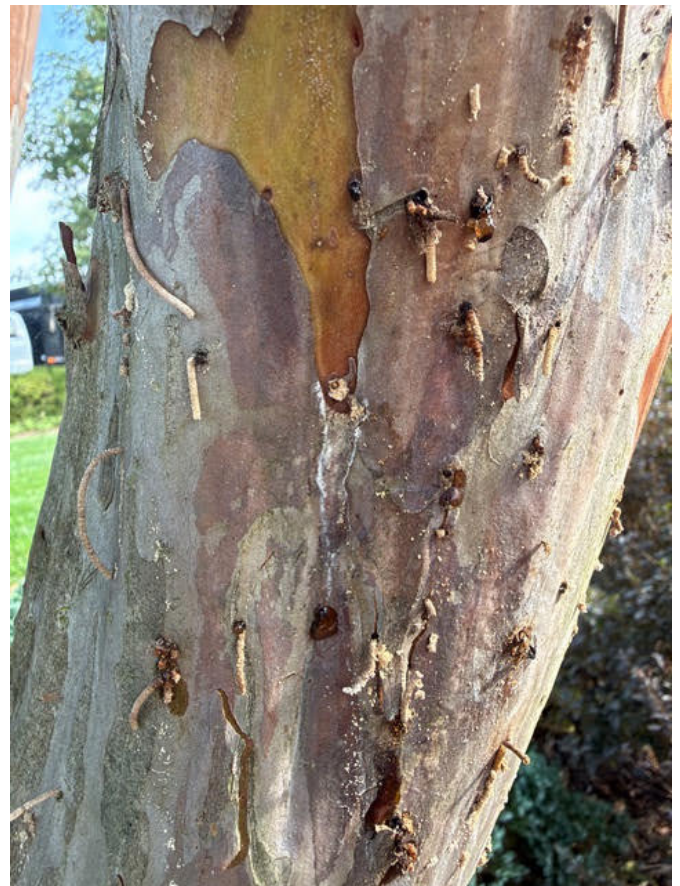
Photo: Suzanne Klick, UME

Late Season Ambrosia Beetle Activity

By: Laura Nixon

This week, Bob Mead, Mead Tree Experts, sent us a photo of numerous tubes coming from a mature tree. These are indicative of ambrosia beetle activity. When the adult beetles enter the tree trunk, they push out sawdust and frass which create these “toothpicks”. Adult beetles will overwinter inside the trunks of host trees, where they bore galleries through the sapwood.

Ambrosia beetles are attracted to the ethanol produced by stressed trees; the best preventative measure is to maintain healthy trees. If you catch beetle activity early, you can apply a protective trunk spray (check labels for your tree species) to prevent more beetles moving in. Unfortunately, the tree pictured has a high population of ambrosia beetles which will continue to tunnel and weaken the tree from the inside.



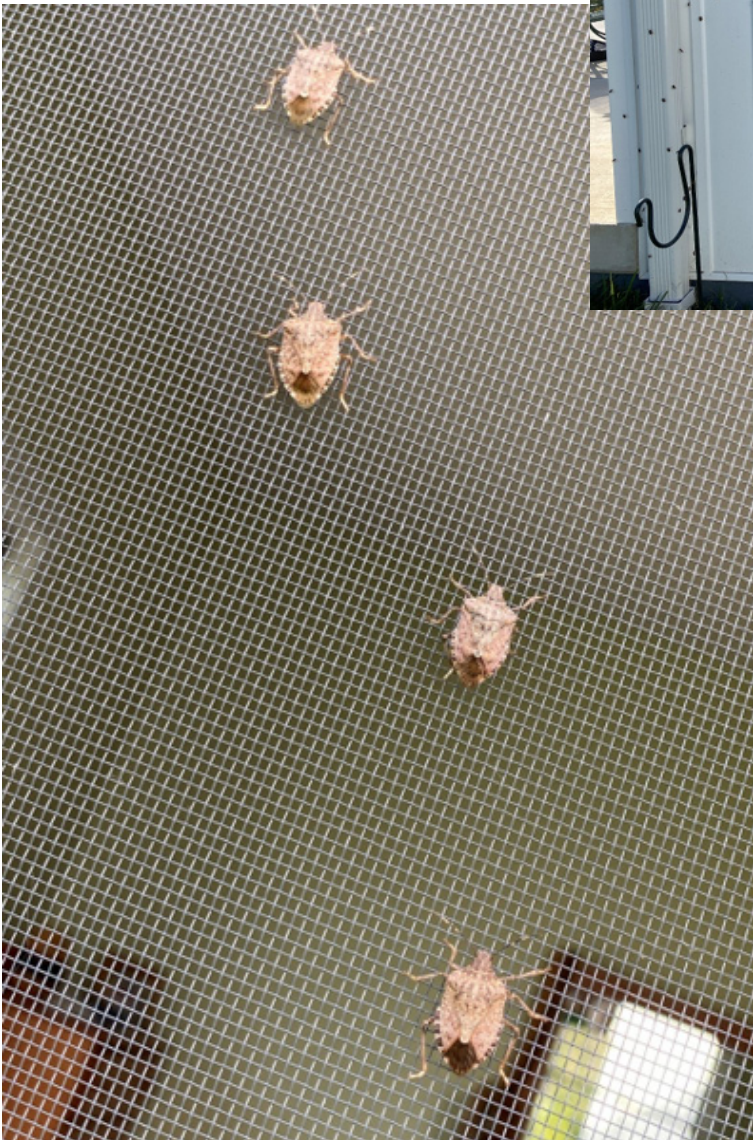
The many frass tubes indicate a heavy infestation of ambrosia beetles on this tree.

Photo: Bob Mead, Mead Tree Experts

Brown Marmorated Stink Bug Would Like to Come in Your House, Please!

By: Laura Nixon

In this region, we are no strangers to brown marmorated stink bug (BMSB) (*Halyomorpha halys*) gathering on and around our houses and sheds at this time of year. BMSB overwinter as adult bugs, going into an inactive state called diapause. In the fall they seek out tight hidden spots to diapause safely. Many studies have shown that this species prefers to overwinter in groups, in sheltered, dry areas, and away from direct sunlight. This quite nicely describes air vents, attics, and crawl spaces, which is why we have seen high numbers gathering on our houses this week. Other places you may find BMSB overwintering include beneath loose tree bark, in folded tarps, and the nooks and crannies of unused vehicles. Overwintering BMSB are a nuisance pest as they cause a “stink” when startled and release yellow colored waste which stains walls and other surfaces. The only way to keep BMSB out of your house is physical exclusion.



Brown marmorated stink bug gathering on the outside of a residence, seeking out overwintering sites.

Photo: Paula Shrewsbury, UMD

**“Excuse me, may we come in?”
Photo: Paula Shrewsbury, UMD**

Beneficial of the Week

By: Paula Shrewsbury, UMD

It's a good time to talk about soldier beetle larvae

Back in early June, when adults of soldier beetles (Coleoptera: Cantharidae) were abundant and busy [mating](#), and feeding on nectar and pollen and other insects, I wrote a [Beneficial of the Week \(June 5, 2026\)](#) on them. Now we are just into October, and I want to talk a bit about the larvae of soldier beetles, often referred to as velvet worms. On Tuesday this week, I observed my first few soldier beetle larvae of the season as they were foraging on a patio in Sharpsburg, MD.

Several species of soldier beetles occur in Maryland. At this time of year, we more commonly see a species of soldier beetle that is frequently found on the flowers of golden rod (*Solidago* spp.) known as the **Pennsylvania or goldenrod soldier beetle**, *Chauliognathus pennsylvanicus*.

Soldier beetles are highly beneficial insects in our landscapes and nurseries as they play a role as pollinators and predators. I have seen adults on many different types of flowering woody and herbaceous plants feeding on the nectar and pollen. Adult soldier beetles are omnivorous and reported to feed on nectar, pollen, honeydew, and caterpillars, aphids, and other soft-bodied insects. Larvae are active in the soil and leaf litter and feed on insect eggs, small caterpillars, fly larvae (maggots), other soft-bodied insects, slugs, and snails. Larvae sometimes climb up plants and hunt for prey on foliage and in flowers ([see video of larva hunting](#)).

Of course, I had to take pictures of the larvae of the soldier beetles I observed the other day. When I zoomed in on a few pictures, I could clearly see that the soldier beetle larva had exuded drops of defensive compounds from exocrine glands that lined both sides of its body (see image). In this photo, some droplets looked like a clear brown color, and others looked more like a milky secretion. This is not surprising since soldier beetles display aposomatic (warning) coloration with their orange and black colors. There have been studies in other species of *Chauliognathus* soldier beetles that excrete defensive compounds from their glands. A major compound found in this excretion is (8Z)-dihydromatricaria acid (DHMA). DHMA



Soldier beetle larva with several drops of defensive compounds (red arrows) exuding from glands along the sides of the body after I gently disturbed it.

Photo: Paula Shrewsbury, UMD



Adult Pennsylvania soldier beetles are frequent visitors to flowers such as goldenrod in the late summer and fall.

Photo: Michael Raupp, UMD

has been shown to act as a strong feeding deterrent providing soldier beetles and their eggs protection against predators, in particular jumping spiders, birds, and rodents which learn to avoid the beetles as a prey item. A few interesting facts about this compound in soldier beetles are that the beetles biosynthesize DHMA from unique enzymes within their bodies, it is not sequestered from their food, as is the case with some other insects that secrete defensive compounds. Moreover, the only other organisms found to make DHMA are plants and fungi, soldier beetles are the only insect to make DHMA. In fact, DHMA is rare in the animal kingdom in general. Very interesting.

Weed of the Week

By: Nathan Glenn

Perennial Sowthistle (*Sonchus arvensis*)

As we move into fall, many perennial weeds are beginning to shift resources from their aboveground growth back into roots and other underground structures that will carry them through the winter. That makes this a good time to take a closer look at **perennial sowthistle (*Sonchus arvensis*)**, a persistent perennial broadleaf weed that can occur in nurseries, landscapes, roadsides, agricultural fields, and other disturbed areas. Unlike the annual sowthistles that may look very similar aboveground, perennial sowthistle develops an extensive spreading root system that allows established patches to survive from year to year and expand vegetatively.



Photo 1: Sowthistle in spring.
Photo: Davey Resource Group

Identification

Perennial sowthistle is an erect perennial that commonly grows several feet tall. Mature plants have hollow stems, and breaking the stem or leaves releases the characteristic white, milky sap common to sowthistles. Leaves are alternate, irregularly lobed, and have prickly-toothed margins. Leaves become smaller and generally less lobed farther up the stem, while their bases form rounded lobes that clasp the stem. These clasping leaves are a useful identification characteristic.

Bright yellow, dandelion-like flower heads develop near the ends of the stems and can reach approximately 1–2 inches across. The green bracts surrounding the flower head may have sticky, glandular hairs. After flowering, seeds develop with a tuft of white hairs, or pappus, that allows them to be carried by wind. Seeds can also cling to fur or clothing and be moved to new locations.

The characteristic that really separates perennial sowthistle from its annual relatives, however, is underground. It develops an extensive network of fleshy horizontal roots containing buds capable of producing new shoots. Those roots are brittle and easily broken, which means simply chopping or partially digging an established patch may leave behind pieces capable of producing additional shoots. This extensive root system is one reason established perennial sowthistle can be so difficult to eliminate.



Photo 2: Sowthistle buds.
Photo: Davey Resource Group

Habitat and Timing

Perennial sowthistle begins producing shoots from established roots in spring and can also establish from seed. Flowering occurs through the summer, with seed production generally occurring later in the season. Above ground growth dies following frost, but the perennial root system survives underground and produces new shoots the following spring.

The plant can grow in a variety of soils but tends to favor fertile, fine- to medium-textured soils with neutral to slightly alkaline pH. Moist conditions are particularly favorable. Because established plants spread both by seed and underground roots, what begins as a few individual shoots can gradually develop into a larger patch.

Seed is certainly important for establishing new infestations, but once a patch is established, the root system becomes the more difficult management problem. Preventing flowering and seed production will reduce spread to new locations, but controlling an existing patch requires repeatedly weakening those underground reserves.

Cultural and Mechanical Control

Small, newly established plants should be removed before they develop an extensive root system. Digging can work with very young plants, but established perennial sowthistle is considerably harder to remove because its brittle roots readily break and remaining pieces may resprout.

For established patches, persistence is more important than a single aggressive treatment. Repeated removal of the top growth forces the plant to repeatedly draw upon carbohydrates stored in the roots. Research indicates that perennial sowthistle is particularly vulnerable when regrowth reaches approximately the **four- to six-leaf stage**, when root reserves have been drawn down to support the new shoots. Repeatedly removing regrowth at that stage can progressively exhaust the underground root system.

Mowing can therefore be useful, but a single mowing is unlikely to provide lasting control. Repeated mowing that prevents flowering while continually depleting root reserves is much more effective. Substantial reductions in perennial sowthistle has been reported where hay was mowed several times per season over multiple years. In cultivated settings, repeated tillage can also weaken the root system, although simply fragmenting the roots without following up on the resulting regrowth can allow plants to recover.

Improving drainage where practical and maintaining vigorous desirable vegetation can also help. Perennial sowthistle performs especially well in moist soils and is relatively sensitive to shade, so dense turf, crops, or other desirable plants that compete strongly for light can help suppress it.

Chemical Control

Herbicide treatments are generally more successful when they are timed to the plant's biology rather than simply applied whenever shoots are noticed. Michigan State Extension notes that perennial sowthistle is particularly susceptible to herbicides **in the fall at the rosette stage or between the bud and flowering stages**, and that sequential applications may be necessary for established populations.

This timing is especially important with a perennial weed because successful control requires movement of a systemic herbicide into the underground root system, not just injury to the leaves. Product selection will depend heavily on whether the infestation occurs in turf, ornamental landscapes, nurseries, pastures, or agricultural fields. Always select a product labeled for the site and desirable plant species being treated and follow all label directions.



Photo 3: Sowthistle flowers.
Photo: Davey Resource Group



Photo 4: Sowthistle rosette in the winter.
Photo: Davey Resource Group

Management Tip

Do not judge control of perennial sowthistle only by whether the shoots disappear after treatment. The real target is the **underground root system**. A patch that looks dead aboveground may still contain enough stored energy to produce another flush of shoots. Watch treated areas for regrowth and be prepared to follow up.

Interesting Fact

Although its windblown seeds make perennial sowthistle look like a weed that primarily spreads by seed, established infestations are driven heavily by vegetative reproduction from the roots. That is why plants often occur in expanding patches rather than as scattered individuals—and why preventing seed production alone will not eliminate an established infestation. The seeds themselves have relatively little dormancy, and one reference reports that seed viability can decline substantially within only a few years.

Plant of the Week

By: Ginny Rosenkranz

Solidago sphacelata 'Golden Fleece' is a compact version of *Solidago sphacelata* or autumn goldenrod. It grows only 1 – 2 feet tall and wide, thriving in full sun and average to dry, well drained fertile soils. Like other goldenrods, it spreads but slowly by creeping rhizomes growing only 30 inches wide or more, creating a mat of dark green foliage before blooming from August to October. This plant was discovered as a compact spontaneous seedling growing in a garden in North Carolina. It was sent to Mt Cuba which introduced it into commerce. It also won the International Stauden-Union's award for outstanding new plant in Switzerland in 1994. The small star-shaped flowers are golden yellow and clustered along the multi-branched stems. They are arranged in panicles with 3-6 yellow ray flowers and 3-6 yellow disc flowers per head. The flowers appear on one side only of the spreading branches like a golden yellow mantel. The basal rosette of heart-shaped, green, serrated leaves are larger than the alternately placed stem leaves. When in bloom, the flowers attract many pollinators including butterflies, and bees, while small mammals and songbirds will enjoy the seeds. Easy to grow, 'Golden Fleece' will add bright color to fall borders, cottage gardens, meadows, and the cutting gardens. These beautiful plants bloom at the same time that ragweed blooms, and being brighter they are often wrongly accused of causing hay fever. Plants occasionally get leaf rust, powdery mildew, and leaf spot. Root rot may appear if planted in poorly drained soils. Different types of beetles enjoy the plant as well as aphids and gall forming insects. Plants are very tolerant of drought, deer browsing, heat, fire, and erosion.



Solidago sphacelata 'Golden Fleece' attracts many late season pollinators.

Photos: Ginny Rosenkranz, UME

Pest Predictive Calendar “Predictions”

By: Nancy Harding and Paula Shrewsbury

In the Maryland area, the accumulated growing degree days (**DD**) this week range from about **3327 DD** (Clarksville) to **4457 DD** (Nat'l Arboretum/Reagan Nat'l). 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.

Banded ash clearwing borer – adult emergence (**3357 DD**)

Tuliptree scale – egg hatch / crawler (**3472 DD**)

Spotted lanternfly – egg laying (**Sept.**)

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

Degree Days (as of September 30, 2026)

Annapolis Naval Academy (KNAK)	4048
Baltimore, MD (KBWI)	3979
Belcamp (FS836)	3920
Clarksville (001MD)	3327
College Park (KCGS)	4101
Dulles Airport (KIAD)	4005
Ft. Belvoir, VA (KDA)	4171
Frederick (KFDK)	3629
Gaithersburg (KGAI)	3809
Greater Cumberland Reg (KCBE)	3573
Martinsburg, WV (KMRB)	3676
Millersville (MD026)	3979
Natl Arboretum/Reagan Natl (KDCA)	4457
Perry Hall (C0608)	3714
Salisbury/Ocean City (KSBY)	3978
St. Mary's City (Patuxent NRB KNHK)	4200
Westminster (KDMW)	3914

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 calculator Thresholds in: Fahrenheit °F Lower: 50 Upper: 95 Calculation type: simple average/growing dds Start: Jan 1

Conferences

[FALCAN Truck & Trailer Safety Seminar](#)

October 14, 2026

Location: Urbana Fire Hall, Urbana, MD

Registration opens in July.

Maryland Turfgrass Conference

December 15, 2026

Location: Turf Valley Resort, Ellicott City, MD

December Integrated Pest Management Conference

Date and location will be posted when confirmed.

2027 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 4 - Thursday, January 7, 2027 from 8:00 am – 3:00 pm

Lab dates: Monday, January 4 - Thursday, January 7, 2027 from 3:30 pm – 5:30 pm (space limited)

Course information: <https://landscapeipmphc.weebly.com/>

Registration: <https://www.eventbrite.com/e/2027-advanced-landscape-ipm-phc-short-course-tickets-1992372702386?aff=oddtcreator>

Questions contact: Amy Yaich, 301-405-3911, umdentomology@umd.edu

Maryland Arborists' Association Conference

January 12, 2027 (snow date in January 13, 2027)

Location: Howard Community College, Columbia, MD

FALCAN Pest Management Conference

January 22, 2027 (snow date is March 12, 2027)

Location: Frederick Community College, Frederick, MD

LCA Pest Management Conference

January 28, 2027

Location: Turf Valley Resort, Ellicott City, MD

2027 Manor View Farm & Perennial Farm Education Seminar

February 2, 2027. Valley Mansion, Cockeysville MD

Laura Nixon is speaking at this event.

Chesapeake Green Horticultural Conference

February 11 and 12, 2027

Location: Maritime Institute and Conference Center, Linthicum Heights, MD

Eastern Shore Pest Management Conference

February 16, 2027

Location: Wicomico Civic Center, Salisbury, MD

2027 Precision Agriculture Technology Conference

February 25, 2027

Location: Crowne Plaza in Annapolis, Maryland.

This year's theme, Plowing Through the Hype: What Happens When AgTech Meets the Field?, will focus on the practical applications and profitability of agricultural technology. Topics include artificial intelligence, robotic weed management, drones for nutrient management and prescription mapping, and the economics of adopting these tools.

Commercial Ornamental IPM Information

<http://extension.umd.edu/ipm>

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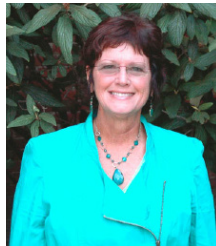
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