UNIVERSITY OF MARYLAND EXTENSION

TPM/IPM Weekly Report
for Arborists, Landscape Managers & Nursery Managers

Commercial Horticulture **August 9, 2019**

In This Issue...

Pest Predictive Calendar

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

Coordinator Weekly IPM Report:
Stanton Gill, Extension Specialist, IPM for Nursery, Greenhouse and Managed Landscapes, sgill@umd.edu. 301-596-9413 (office) or 410-868-9400 (cell)

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) and David Clement (Extension Specialist)
Weed of the Week: Chuck Schuster (Extension Educator, Montgomery County)
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)

Dead Spruce Trees

By: Stanton Gill

While driving around Carroll, Washington, Montgomery, Anne Arundel, and Baltimore counties, I am seeing an incredible number of spruce trees that are defoliating and looking terrible. Some are actually dead at this point. The 88 inches of rain in 2018 and the very wet spring in 2019 has hit spruce on the chin. Needle cast disease is everywhere and destroying many of these plants in the landscape. It has also majorly impacted Christmas tree growers and many nursery owners growing spruce. With the excessive hot weather of the last two weeks, the damaged foliage is dropping off rapidly.

Not much can be done at this point. Spruce can be protected with cover protectant sprays in spring, and we will try to list materials in the spring of 2020 to try help prevent this disastrous event from occurring again.

Blue spruce infected with *Rhizosphaera* needle cast disease
Photo: USDA Forest Service - North Central Research Station, USDA Forest Service, Bugwood.org

Commercial Cut Flower Growers Seminar

By: Stanton Gill

We have had a growing number of cut flower operations opening up in Maryland over the last couple of years. We are organizing a one day tour and field seminar on commercial cut flower production on September 10, 2019.

We will be visiting **Cool Hollow Flower Farm (Hagerstown)** and **Surreybrooke Farm (Middletown)** to tour their operations. We will have a series of seminar topics in the afternoon at Surreybrooke Farm. Registration information will be posted to the IPMnet website in the next 2 weeks.

Filbert Blight and Harry Lauder's Walking Stick

By: Stanton Gill

We received in an inquiry about why a Harry Lauder's walking stick is dying back. This plant is a member of the hazelnut family and is highly susceptible to filbert blight, *Anisogramma anomala*. Infection probably occurred back in the wet spring of 2018 or 2019. The fungus has a life cycle of 2 or more years. No symptoms are visible for the first 12 -16 months after initial infection. In a wet spring, such as 2018 and 2019, spores are ejected and released in a sticky, white ooze. Wind-driven rain and splashing droplets spread spores to young, developing shoots. Infection occurs in wet weather from bud-break through shoot elongation, which was into the end of June with the weather that kept up in 2019. The bottom line is the dieback shows up after the hot part of the summer and the cankers on the stems are really evident. They were there earlier, but people do not notice them until the branch dies back and their attention is drawn to the plant.
Solution: There are resistant varieties of contorted filbert that have been brought onto the market. There was a release of a resistant cultivar several years ago called 'Red Dragon'. I have not tried it out but, it is listed as resistant to this disease.

A filbert blight infection is causing dieback on this Harry Lauder's walking stick
Photo: David Clement

A close-up of the cankers caused by filbert blight

Diagnostic Session with LCA on August 14

By: Stanton Gill

If you are looking to build your diagnostic skills for woody plant problems, there is a session organized by LCA in combination with the University of Maryland Extension on August 14th. Karen Rane, David Clement, Chuck Schuster, Mary Kay Malinoski, and I will be conducting a hands-on session on plant diseases, insects, mites, and weed identification and control options. Visit the LCA website to register for this hands-on session.

More Squirrel Damage

By: Karen Rane

This week we received branch samples from an American hornbeam (*Carpinus caroliniana*) tree that had large elongated wounded areas exposing bare wood. If you look closely, you can see diagonal scraping marks on the wood - a clue that this damage is due to animals, most likely squirrels. There is callus growth surrounding the damaged areas, indicating that the damage occurred last year. If branches or trunks are girdled by this injury, significant dieback or even tree death may result. There are several theories as to why squirrels strip bark off of trees. An interesting article on the subject from the Ohio State University can be found at this link: https://bygl.osu.edu/index.php/node/389

The diagonal scrape marks are a good indication that this damage was caused by an animal
Photos: Karen Rane

Bagworms

Jason Hipp, Deeply Rooted Tree Care, LLC, found bagworms defoliating a Japanese maple in West Friendship on August 1. It is getting late in the season to treat the large bagworms.

Bagworms have defoliated this Japanese maple and a few caterpillars are moving along the support stake
Photo: Jason Hipp, Deeply Rooted Tree Care

Fall Webworm

By: Stanton Gill

The second generation of fall webworms has been heavier this year

Fall webworms are really expanding their webbing this week and becoming very noticeable. Last week Kevin Nickle commented there seem to be more than normal. This is an understatement. I drove down RT. 97 on Tuesday and the trees looked like they had been decorated for Halloween with all of the webbing on branches. Marie Rojas, IPM Scout, is finding them still hatching out on *Cercis canadensis*, *Liquidambar styraciflua*, *Malus* x *domestica* 'Enterprise', and *Prunus serrulata* 'Kanzan'. Aaron Cook, DNR, is reporting that fall webworm activity has been very widespread throughout the Hagerstown Valley this summer. With a native caterpillar like this one, when populations build up, parasites and predators flourish. Generally, populations in the following couple of years the pest are knocked way down in population. I suspect this will occur in 2020 and 2021.

Interesting story: six years ago I was asked to conduct a 4 hour training on the American caterpillar for 13 Chinese entomologists visiting from the central eastern part of China. I was not familiar with an American caterpillar and asked for the Latin name. It was *Hyphantria cunea,* what we call in America, the fall webworm. American shipping companies managed to ship over the fall webworm to China back in the 1990 period. It is now defoliating trees in large areas of central east China. They did not have all of our predators and parasites to keep it in check. Sad story.

Caterpillar Activity Continues

This week, we continue to receive reports of extensive caterpillar activity.

Marie Rojas, IPM Scout, and Gary Huntsberger, Advantage Landscape & Construction Inc., are reporting yellow-necked caterpillars. Marie found them on Dura Heat river birch in Montgomery County.
Photo: Gary Huntsberger, Advantage Landscape & Construction Inc.

Marie Rojas, IPM Scout, is finding magnolia leafminer on magnolia in Montgomery County. The serpentine mines are caused by a caterpillar (*Phyllocnistis magnoliella*).

Redhumped caterpillars are active on eastern redbud in western Maryland
Photo: Aaron Cook, DNR

Aaron Cook, DNR, reports that walnut caterpillars are feeding heavily on shagbark hickory in Clear Spring (Washington County). He noted that it has been a number of years since this tree has had significant defoliation. The caterpillars feed on butternut, hickory, pecan, and walnut.
Photo: Aaron Cook, DNR

Many reports of orange-striped oakworm are coming in to us this year. These caterpillars are feeding on pin oak in Timonium.
Photo: Brian Scheck, Maxalea, Inc.

Argiope Spider

Howard Kimble found this large Argiope spider at River Run Golf Club in Berlin.

Look for predators such as many different spiders as we move into late summer
Photo: Howard Kimble, River Run Golf Club

Beneficial of the Week

By: Rebeccah Waterworth and Paula Shrewsbury

"Worms" on your dill and parsley? The Eastern black swallowtail butterfly, *Papilio polyxenes*

When Paula and I are asked about the best way to encourage visits by butterflies in private yards or other managed spaces, we tell folks to plant host plants for the caterpillars and have flowers that are rich in nectar for the adults. We follow this advice, too! I recently moved into a new house, and I am most of the way through my first "growing season" in my new yard. I have learned that I am better at identifying the insects eating my plants than I am at growing them! On July 21, I discovered young black swallowtail caterpillars (Fig. 1a) (Order Lepidoptera, Family Papilionidae) feasting on a struggling dill plant. Of course, I was okay with the herbivory because I had designed my garden, in part, for them.

Black swallowtails are a native species found in southern Canada along the Eastern Rockies into Arizona and Mexico and east to the Atlantic. In our area, there are two generations a year, and the pupa, in the form of a chrysalis, overwinters. Once the weather begins to warm in May, adult butterflies emerge from the chrysalis, mate, and females quickly search for host plants in the carrot family (Apiaceae). This family includes many of our favorite cultivated species: anise, celery, coriander, dill, fennel, and parsley. (In fact, a widely accepted common name for the caterpillars is parsleyworm.) A wild introduced host is Queen Anne's lace, *Daucus carota*. Caterpillars also feed on a number of native host plants, including mock bishopweed, spotted water hemlock, wedgeleaf eryngo, Canby's dropwort, and a few others.

It appears that the odor from a host plant is important for the female to identify a suitable host for oviposition (or egg-laying). Eggs are laid one at a time, not in large masses like many moths. Apparently, the single dill plant in my garden was perfect because "mom" laid at least 20 eggs! Like other swallowtail caterpillars, early instars (or stages) mimic bird droppings (Fig. 1a-b). Older caterpillars develop beautiful coloration very

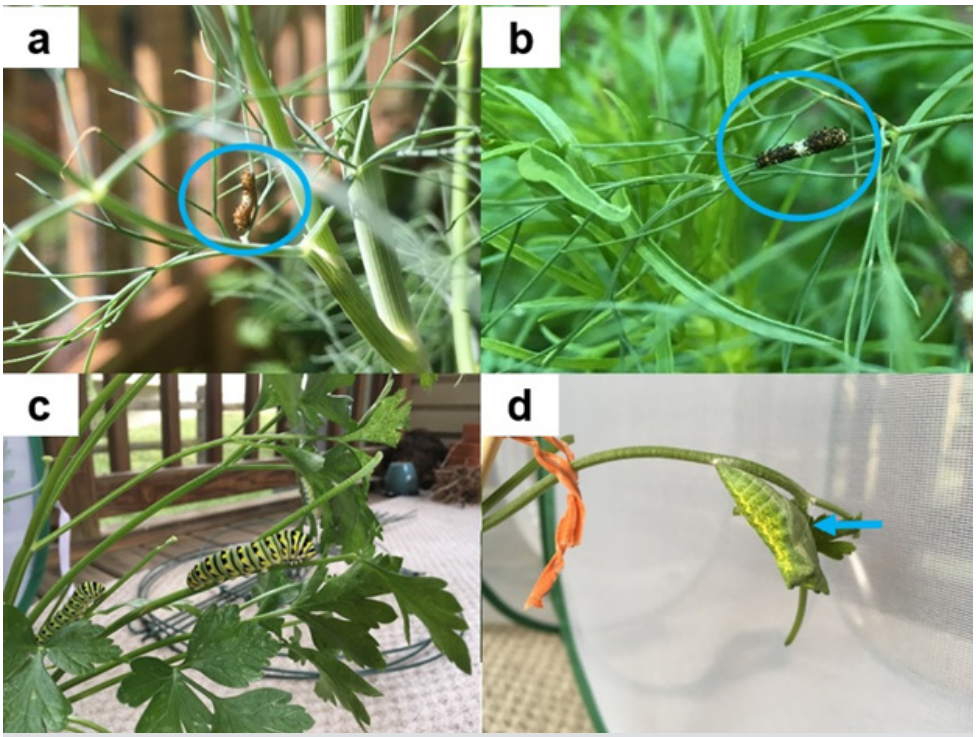

Fig 1a-d. Early instar black swallowtail caterpillars mimic bird droppings. a) Caterpillars on dill 21 July 2019, b) 22 July, c) late instar caterpillar on parsley 31 July, d) green morph of pupa or chrysalis. The arrow is pointing to the silk girdle.
Photos: R. Waterworth, UMD

quickly: a white to leaf-green background and black bands with six yellow to red-orange spots (Fig 1c). This is called disruptive coloration (think about a tiger with stripes sitting under a tree) and helps caterpillars remain hidden while perched on sun-dappled host plants. Larvae have another trick, though, to avoid attacks by predators and irksome entomologists. Behind their head, they have horn-like organs known as osmeteria. They are extruded when threatened, and the larva attempts to smear a *very* smelly chemical repellent on the attacking organism. While I was moving the caterpillars around, one individual took great offense to its relocation, reared up, and used one osmeterium to smear my finger precisely on the side of where I was touching it. It was definitely a coordinated attack. Despite a thorough washing, the smell lingered for hours. Watch this video at about 50 seconds to see the osmeteria emerge after human prodding.

Fig. 2. A male black swallowtail butterfly. Photo: Gerald J. Lenhard, Louisiana State University, bugwood.org

Fig. 3. A female black swallowtail butterfly. Females are Batesian mimics of the unpalatable pipevine swallowtail, *Battus philenor*. Photo: Ansel Oomen, bugwood.org

Clearly, the dill in my garden was not going to support 18 caterpillars for very long. I purchased what seemed like the last five fennel plants in Maryland and transferred the larvae to cages and potted plants, supplemented with stems of parsley for the last couple larval stages and pupation. The fennel was devoured in about 72 hours. All 18 caterpillars developed into pupae within two weeks of having discovered them on my garden plant. I could tell pupation was imminent because many of the caterpillars walked off their plants to settle on the sides of the mesh cage. Within a day, I noted a silk girdle (see Fig. 1d, on the right side of the pupa, attached to the parsley stalk and the side of the chrysalis). About a day later, the banded skin was shed to reveal the green chrysalis beneath. Three of the 18 chrysalides later turned brown, and as it turns out, there are green and brown morphs of chrysalis for black swallowtails. Adults emerge from their chrysalis in 9 to 18 days. If the pupa forms late enough in the season, then it overwinters, and adults emerge the following spring.

Another interesting aspect of black swallowtails is their appearance as adults. They are sexually dimorphic, meaning that males and females look different. While both sexes are predominantly black, males have large conspicuous yellow spots along the edges and in wide bands on the dorsal (upper) wing surface (Fig. 2). The yellow on females is much less bright (Fig. 3). Another difference is the presence of large patches of iridescent blue on the hind wings of females. The blue in males is much less prominent. The reason for this difference has something to do with the incessant threat of bird predation. Black swallowtails would be a tasty snack for a hungry bird. One way to avoid predation by birds is to mimic something that is distasteful or poisonous. When wings are open, female black swallowtails mimic the pipevine swallowtail, *Battus philenor*, a highly unpalatable "model" species. While the males with open wings exhibit some degree of mimicry of their model, it is not as "convincing." However, there is a good reason for this. The coloration and patterns found on the dorsal (top) view of males likely plays a role in male-male interactions in the defense of territory. If wings are closed and held upright over the body, the coloration and patterns of the underside of the wings in both sexes closely matches the underside of the model pipevine swallowtails.

I wanted black swallowtails in my yard because I wanted to enhance the pollinator diversity, so I planted dill and parsley for the caterpillars. Butterflies are after the nectar in flowers, but do inadvertently move pollen from flower to flower if the pollen attaches to scales and hairs on their body. While they are not as "efficient"

as some other insects (do not move as much pollen), any pollinator is welcome in my yard. An added benefit of flowering dill was that I also attracted small bees, which are often very efficient pollinators. Unfortunately, they were too small for me to tell you what they were!

The lessons learned this past summer were simple. 1) If you plant it, they will come. 2) I need to plant more dill, parsley, and fennel next year. 3) I am better at growing caterpillars than peppers.

Weed of the Week

By: Chuck Schuster, UME

Certain plants are becoming very noticeable currently. Mulberry weed or hairy crabweed, *Fatoua villosa*, is a summer annual found throughout the south eastern United States. Named because it is similar to mulberry trees when the weed is less than five inches tall and has less than six leaves. Mulberry weed has prominent hairs on the stems and leaves. The leaves are alternate, toothed, indented with prominent veins, a yellow green color, and hairy with a basic triangular shape. Leaves are attached to the stem by a medium length petiole. Stems secrete a milky sap when cut, and the plant has an oily odor. Flowers are produced quickly on this plant, often on the very young plant. They are tan in color. Seed clusters are pea-sized. The clusters have the ability to discharge the seed up to four feet in distance from the plant. This plant is a prolific seed producer. To prevent next year's problems in the landscape, start by preventing seed production this year. Mulberry weed seeds require sunlight to germinate. Mulberry weed can grow to a height of four feet. The plant prefers moist, shaded areas in the landscape or nursery, easily moving from pot to pot in container nurseries. Seeds can remain viable in the soil or under mulch for several years. Mulberry weed can geminate in a wide range of temperatures, from 60 to 90 °F. Do not compost this weed unless you can determine that the process gets hot enough to kill weed seeds.

Cultural control can include mulching landscape areas and container plants. Hand removal will work but must start early, as they will produce seed on plants less than three inches in height. Pre-emergent herbicides that have been effective including oryzalin, (Surflan) and isoxaben (Gallery). Post-emergent application of either contact or translocated herbicides is also effective, but once the seed is formed will not prevent seed dispersal. Prizefighter (Ammonium Nonanoate …) worked well on this weed this year. Be cautious with the use of glyphosate products in the nursery or landscape where shallow roots or suckers are exposed.

Mulberry weed flowers are produced quickly Photo: Annette Cormany, UME

Mulberry foliage and flowers Photos: Steve Dubik, UME

Plant of the Week

By: Ginny Rosenkranz

Hibiscus 'Summer in Paradise' is a hardy hibiscus that blooms in the late summer with huge bright red textured flowers that open 7-8 inches across. The large dark red buds open to 5 overlapping cherry red petals and a deep burgundy eye with a prominent showy tubular column covered with bright yellow stamens. The bright yellow against the red will draw in many butterflies, bees, hummingbirds, and other pollinators to the flowers. The flowers are produced from to bottom of the plant all the way to the top of the plant, giving color throughout the plant. The foliage is deep green and palmate, looking a lot like a maple leaf. The plants will grow 3-4 feet tall and wide and are winter hardy from USDA zones 5 to 10. Although hardy hibiscus are the latest of the herbaceous perennials to emerge in the spring time and one of the latest to bloom in the summer, it is always so worthwhile waiting for them. They are merely waiting until the last danger of frost has passed. Like all hibiscus, 'Summer in Paradise' needs full sun and rich, moist, but well drained soils to flower their best. They will create strong roots over the years to produce even more flowers each year. Hibiscus can be planted in cottage gardens, rain gardens, as a low hedge or as a specimen plant. Like a lot of native plants, Hibiscus 'Summer in Paradise' is deer resistant, but it is susceptible to leaf spots, rusts, canker diseases, Japanese beetles, sawflies, whiteflies, and aphid insects.

Hibiscus 'Summer in Paradise' produces a stunning display in mid to late summer Photo: Ginny Rosenkranz

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 2314 DD (Cumberland) to 3157 DD (Annapolis Naval Academy). 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.
- Euonymus scale (2nd generation) crawlers (2235 DD)
- Japanese maple scale (2nd generation) crawlers (2508 DD)
- Fall webworm (2nd generation) early to late instars (2793 DD)
- White prunicola scale (3rd generation) crawlers (3270)
- Banded Ash clearwing borer adult emergence (3357)
- Tuliptree scale crawlers (3519)
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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 August 7)

Abingdon (C1620)	2610
Annapolis Naval Academy (KNAK)	3157
Baltimore, MD (KBWI)	2839
College Park (KCGS)	2632
Dulles Airport (KIAD)	2693
Frederick (KFDK)	2706
Ft. Belvoir, VA (KDA)	2811
Gaithersburg (KGAI)	2586
Greater Cumberland Reg (KCBE)	2314
Martinsburg, WV (KMRB)	2468
Natl Arboretum.Reagan Natl (KDCA)	3118
Salisbury/Ocean City (KSBY)	2813
St. Mary's City (Patuxent NRB KNHK)	2992
Westminster (KDMW)	2896

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: 95Calculation type: simple average/growing dds Start: Jan 1

CONFERENCES

LCA Plant Diagnostic Program
August 14, 2019
Location: Ag Farm Park, Derwood, MD
Registration

September 10, 2019
Commercial Cut Flower Tour
Locations: Cool Hollow Flower Farm and Surreybrooke Flower Farm
Registration information coming soon

December 6, 2019
Pest Management Conference
Location: Carroll Community College, Westminster,

December 17, 2019
Biocontrol Conference
Location: Maritime Insitute, Linthicum Heights, MD

Advanced IPM PHC Short Course
Monday, January 6 - Thursday, January 9, 2020
Location: University of Maryland, College Park, MD
Contact: Amy Yaich, Admin. Assist. II, 301-405-3911, umdentomology@umd.edu
Registration Information: https://landscapeipmphc.weebly.com/
Recertification credits will be posted on the website

January 17, 2020
FALCAN Pest Management Conference
Location: Frederick Community College, Frederick, MD

February 13, 2020
2020 Pesticide and Fertilizer Recertification Conference
Location: Rockville, Maryland

February 19 and 20, 2020
Chesapeake Green: A Horticulture Symposium
Location: Maritime Institute, Linthicum Heights, MD

MDA Container Recycling Program
See the MDA brochure for locations and dates for the 2019 MDA Container Recycling Program

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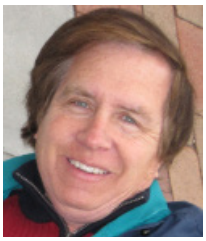
CONTRIBUTORS:



Stanton Gill
Extension Specialist
sgill@umd.edu
410-868-9400 (cell)

Paula Shrewsbury
Extension Specialist
pshrewsb@umd.edu

Karen Rane
Plant Pathologist
rane@umd.edu

Chuck Schuster
Extension Educator
cfs@umd.edu

David Clement
Plant Pathologist
clement@umd.edu

Andrew Ristvey
Extension Specialist
aristvey@umd.edu

Ginny Rosenkranz
Extension Educator
rosnkrnz@umd.edu

Nancy Harding
Faculty Research
Assistant

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