UNIVERSITY OF MARYLAND EXTENSION

TPM/IPM Weekly Report

for Arborists, Landscape Managers & Nursery Managers

Commercial Horticulture **July 6, 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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The Heat is On

By: Stanton Gill

The temperatures soared over the last 7 days with record temperatures across the United States and especially up and down the East Coast as far north as Canada.

Be aware that substrate temperatures, especially in black pots, can soar during these hot periods

I measured the temperature in some container stock on Tuesday and Wednesday. The containers were on black weed barrier. The plants in 5 gallon pots had been watered in the morning. In the morning, the temperatures were reasonable (80 °F range), but by afternoon the south and west sides had reached up into the upper 90 °F range and some reached the low 100 °F mark. These temperatures are not good for root systems and will damage them. The scorching will be showing up next week. It is supposed to cool down a bit this weekend, but we will see the scorching damage show up on container plants and plants in the ground that are growing in poorer soils.

Daytime Temperatures Increase the Need for Substrate Monitoring

By: Andrew Ristvey

The beginning of this summer was cool and quite wet for many of us. Plants were slow to start and extra fertilizers were probably applied to kick start growth. Now that the heat has come on in earnest, irrigation managers should definitely be monitoring their substrates and slow release fertilizers. As we know, high temperatures can cut the effective release times of many fertilizers nearly in half. Temperatures will continue to remain high for this week and next and this will hasten the release of nutrients from your slow release fertilizer.

Tipping pot after an irrigation event to gather a water sample
Photo: Andrew Ristvey, UME

I want to remind you that monitoring the nutrient content in your containers would be proactive way to stave off any nutrient related problems which could negatively impact your plants. Either a pour-through or a SME will do. However, another easy method is to gather a sample of water from some of your containers at least a half hour after an irrigation event. You can remove a small portion of water from your container by picking it up and tipping it. Water that flows out of the drain holes can be collected. An ounce is adequate for most conductivity meters.

Performing these tests earlier in the day is best to solve potential problems before the afternoon heat. Remember that you are looking for EC levels between 0.5 dS/m and 2.0 dS/m. Anything below 0.5 dS/m (after subtracting your well-water EC value) and you may want to consider either less irrigation or supplemental fertilizer. Anything between 2.5 and 3 dS/m (or above) would indicate that leaching may be needed, especially if a hot day is expected. Electrical conductivity of 4 dS/m will kill roots. Electrical conductivity levels could be lower in SME's since you are diluting the sample. As a reminder, the following EC units all mean the same thing: mmhos/cm (milli-mhos per centimeter) = mS/cm (milli-siemens per centimeter) = dS/m (deci-siemens per meter) = 1000 µS/cm (micro-siemens per centimeter).

Spent prill expresses last bit of nutrient salts
Photo: Andrew Ristvey, UME

Most important is irrigation management. Monitor container moisture and try not to over irrigate, as to not exacerbate a nutrient leaching problem. Ideally, avoiding the application of more nutrients by keeping what you have in the container is most important.

Don't forget to keep an eye on your pH. The pH range for soilless potting media is between 5.8 and 6.3 for optimum nutrient availability. Monitoring your container root zone EC and pH goes a long way for preventing nutrient related problems including deficiencies and toxicities. Certainly, pathogen infections may be kept in check simply by keeping your roots healthy. If time is a premium, know where your trouble spots are and focus your efforts.

You can call me for additional information or with any questions you have at 410-827-8056 x113. Good luck with the rest of this growing season!

Drought Stressed Turf

Despite the early rains, we went into a period of dry weather which has caused some turf areas to become drought stressed.

Drought stress on turf is evident in this lawn in Timonium
Photo: Mark Schlossberg, ProLawn Plus, Inc.

White Prunicola Scale – Monitor for it in Early July

Stanton Gill

I was visiting a nursery in Harford County and the managers asked me to look at some tree lilacs with a scale on them. It was white prunicola scale, and the males were producing a lot of white carinae (white felt-like pupal casing). This activity was on June 22. The males were just starting to emerge which means they would be mating with females shortly afterwards. Normally, as we move into early July, we usually find crawlers present, but I think the cool wet spring delayed the life cycle slightly. In central Maryland, I expect the crawlers in mid-July, but if you are a landscaper or nursery grower on the Eastern Shore, start checking for crawlers now. Check the degree days listed at the bottom of this report to help you determine when crawlers start. Examine lilacs, cherry trees and of course, cherry laurel, which usually are loaded with this scale.

Look for the salmon-colored crawlers of white prunicola scale in the next few weeks

Japanese Beetle Update

By: Stanton Gill

Well, overall, here in Maryland, it appears Japanese beetle adult activity is lighter than normal this summer. If you are finding large populations in your area let me know at Sgill@umd.edu. Rick Yates, Griffin Company, sent me the following information: “A quick field report from Lancaster County, Pennsylvania. I have heavier Japanese beetle damage this year than I can recall from the past. Dwarf crape myrtle and miniature roses are taking the brunt of it. They are elbowing each other out of the way to get at the rose flowers!”

Japanese beetle activity levels are varied in the region this season

It's That Scarab Beetle Time of Year

By: Paula Shrewsbury

There are a number of beetle adults active now that belong to a group known as scarab beetles (family Scarabaeidae). The immature stages of scarab beetles are known as white grubs. The amount of damage caused by adult and immature scarabs varies with species, and of course factors such as environmental conditions and management practices. Unfortunately, that is not all of the scarabs. Of the scarab beetle adults, Japanese beetles are usually the most damaging. That's not to say, however, that other scarab adults can't be particularly abundant and damaging some years. Let's talk a bit about the adults of each of the different scarab beetles. To see pictures of adult scarab beetles go to: http://ohioline.osu.edu/hyg-fact/2000/pdf/2510.pdf

Japanese beetle and Oriental beetle adults are relatively similar in their life cycles and management. We have had lots of reports of Japanese beetle activity so far this season. Japanese beetle adults skeletonize foliage and can cause significant damage to many species of ornamental plants (over 300), most commonly linden trees and roses. Oriental beetles are usually less conspicuous and damaging than Japanese beetles. I don't believe we have had reports on these so far. I often find them feeding on the flower petals of many of my herbaceous plants. They seem to particularly like my Shasta daisies and cone flowers. Oriental beetles usually do not warrant control but they seem very abundant this year and I am seeing quite a bit of damage on herbaceous perennials (ex. flower petal defoliation). Japanese beetles often require control measures.

Oriental beetle settling down for a meal of a Shasta daisy flower
Photo: P. Shrewsbury, UMD

Control: Research has shown that once Japanese beetles start feeding on plants the plant releases some sort of cue that calls in other Japanese beetles to the plant. A good practice is to stop Japanese beetles as soon as see them, before they do much feeding damage. If you do not have "lots" of plants you can try hand removing beetles. I suggest a 16 oz Solo type plastic cup half filled with water and a teaspoon or so of dish liquid. Place the cup under the leaf the beetles are on because when you go to grab the beetles they usually "drop" from the plant. An appropriately placed cup will result in beetles dropping to their death rather than beetle escape.

Asiatic garden beetle feeding on butterfly bush at night
Photo: P. Shrewsbury, UMD

Chemical controls are also available. Products with Neem are classified as low risk products. Studies have found these affective but they usually have to be applied every 4 or so days. Other options are Acelepryn or Mainspring. Acelepryn has been found to be affective for Japanese beetle adult control 3-4 weeks and is listed as a "reduced risk" pesticide by EPA. It has been shown to not be toxic to honey bees. Mainspring does have a bee warning on the label. There are also other labeled products available. Be sure if you are applying pesticides to flowering plants or areas where flowering plants are nearby to read the labels carefully.

Green June beetle adults were reported in last week's report for the first time. I have seen a few beetles this week in Columbia. Green June beetles are large metallic green and gold scarab beetles. They are often seen swarming around trees (often those with skinned thin fruits that the beetles feed on) or over turfgrass where they are likely looking for mates or a site to lay their eggs. As adults these beetles seldom warrant control measures. There large size makes them a little scarier than other scarab beetles – none of which should be scary to people, only plants.

Green June beetle adults will feed on ripe thin skinned fruits
Photo: Jack Kelly Clark, University of California

Asiatic garden beetles are tricky little guys. A few weeks ago I started to see feeding damage on my *Buddleia* (butterfly bush) but saw no insects on the plant! From past experience and monitoring I knew it was Asiatic garden beetles causing the damage. Asiatic garden beetle adults are nocturnal – only active at night. During the day they hide in turf and grassy areas near their food plants and largely go unnoticed. At night temperatures below 70 °F the beetles fly very little. On warmer nights you can see hundreds flying around and feeding on plants, especially in July and August around 9:30 p.m. or later (not earlier). Yes - their activity is that specific. These beetles are also attracted to lights so large numbers can accumulate at outdoor lights. Asiatic garden beetle adults feed on about 100 species of plants but seem to like butterfly bush, boxelder, cherry, and more. They do not skeletonize like Japanese beetle. Asiatic garden beetle often defoliates the majority of leaves leaving behind only the mid-vein. Their occurrence in high numbers is patchy and localized so they often do not warrant control (unless you have or are managing one of the plants they like and the beetles are in that area). Reducing weedy habitat can reduce Asiatic garden beetle densities. A cup of soapy water should work on these beetles too. Otherwise management is similar to that of Japanese beetles.

I saw my first masked chafer beetle at my porch light last night. There are two species of masked chafers that occur in this area, the northern and southern masked chafers. They have similar life cycles. Adults are also nocturnal and have similar activity as the Asiatic garden beetle. The adult masked chafers, however, don't feed so no worries about the adults of this one. I usually see the white grubs of masked chafer in the soil / root zone of plants in landscape beds and under trees, usually soils with a good organic content. I have also seen very high densities of grubs in soils with no signs of damage to the trees.

Spotted Lanternfly in Pennsylvania

Richard Gardner found spotted lanternfly nymphs in Berks County, PA on July 4. Keep an eye out for the nymphs at this time of year. Please be vigilant for activity of this pest in Maryland and let us know if you see something like the insect in this photo. So far, it has not been reported in Maryland. It has been found in both Pennsylvania and Virginia.


Spotted lanternfly nymphs are active in Pennsylvania this week
Photo: Richard Gardner

One More Tick

By: Stanton Gill

Some of your customers may have a couple of goats, sheep or a beef cattle or two and will be impacted by this new tick from Asia. It was found in New Jersey, West Virginia, Virginia and Arkansas. It is not in Maryland yet, but Megan Fritz and Racheal Slattery, UMD, are monitoring in Maryland. To find out how to submit a tick sample, see the fact sheet at https://extension.umd.edu/sites/extension.umd.edu/files/_docs/articles/Longhorned%20Tick%20Extension%20Bulletin.pdf

Giant Leopard Moth, *Hypercompe scribonia*

Alex Wlazlak, Good's Tree and Lawn Care, found a giant leopard moth, *Hypercompe scribonia*, that landed on a sugar maple in Hershey, PA on July 3. The larvae of this moth are not considered a pest. There is a similar looking moth, called the leopard moth (*Zeuzera pyrina*), that can be a problem when the larvae bore into trees. *Z. pyrina* caterpillars feed internally for two or three years in the stems and branches before emerging to pupate under the bark.

The larvae of the leopard moth, *Hypercompe scribonia*, have a wide plant host range
Photo: Alex Wlazlak, Good's Tree and Lawn Care

Monarch Caterpillars

Monarch caterpillars are one of the caterpillar species that are now active in the area. Craig Greco, Yardbirds, Inc., found them on milkweed in Middleburg, VA. Monarchs and their caterpillar hosts (*Asclepias* spp.) have an interesting relationship. Milkweeds contain cardenolides which are sequestered by the monarch caterpillar when they consume the milkweed. This feeding gives the caterpillars a defense, also retained by the adult butterfly, in the form of a nasty taste that deters many predators from eating them. Over time some predators have evolved mechanisms to overcome these toxins and are able to consume monarchs.

Look for monarch caterpillars feeding on species of *Asclepias* (milkweeds)
Photo: Craig Greco, Yardbirds, Inc.

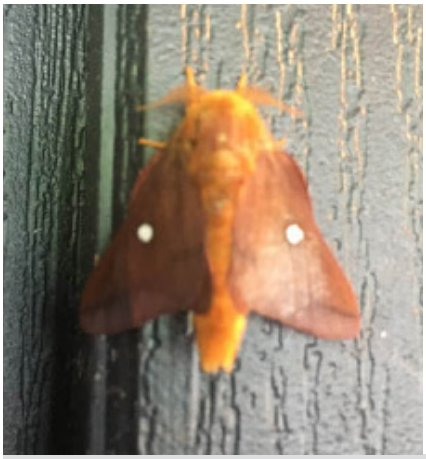
Screening Plants That are Not Leylands and Thuja Green Giant

By: Stanton Gill

Thanks to the many people who sent in their suggestions for screening plant material. I am working on a fact sheet with these suggestions and will include the pictures that each of you sent to me. We will post it when it is available.

Orange-tipped Oakworm Moth

Usually, we receive reports of the caterpillar of this moth. The caterpillar is called the orange-striped oakworm. Look for them as we move through July and into August. Greg Dionne, Hometown Tree Experts, found the moth in Littlestown, PA this week. Greg noted that last year that two of his pin oaks were covered with the caterpillars. There is one generation per year.
Control: Parasitic wasps help keep caterpillar populations in check. Bt can be used for small larvae, and other labelled insecticides are available for larger caterpillars if needed.



Orange-tipped oakworm moths are laying eggs at this time of year; the larvae are orange-striped oakworms
Photo: Greg Dionne, Hometown Tree Experts

Look for various stages of orange-striped oakworms this month

Apple Scab: A Tough Season

By: Kari Peter, Penn State Extension

Primary scab infection is defined as the ascospores released from the overwintered leaves from the previous year's infected leaves. For the last two weeks, we have not detected any scab spores released from last year's leaves indicating the primary infection period is over. This was an exceptionally challenging year. The peak period for mature ascospores to disperse was from April 30 – May 20 this year. During this time, May 12 – May 20 was one very long scab infection period. I know growers struggled to apply any kind of protection during this period. Some were successful; some were not. If you are experiencing some type of scab in your orchard this season, Mother Nature is to blame this year; not fungicide resistance. Whatever spores established on leaves and fruit during the primary infection period will produce additional spores called conidia in vast quantities. These summer spores can cause infection throughout the summer, and we call this stage the "secondary infection period." It is important to monitor your orchard for any scab infection that became established during the "primary" period because scab control will be needed throughout summer to keep the disease from causing significant damage to fruit. If you use sulfur, be mindful of daytime temperatures: temperatures exceeding 80-85 °F can cause phytotoxicity when sulfur is present.

Cherry Leaf Spot: Management Needed Postharvest

By: Kari Peters

Tart cherry harvest is at our doorstep; however, disease management does not stop with the harvest. Like apple scab, we have had incredibly ideal conditions for cherry leaf spot. Case in point: I applied a fungicide spray on my tart cherry block during early May and subsequently forgot to apply another spray until after Memorial Day – almost four weeks later. My attention was 100% consumed with fire blight during this period and, unfortunately, something fell through the cracks. My poor tart cherry trees are heavily infested with cherry leaf spot and losing leaves. Hopefully, tart cherry growers in the area have done a much better job than I have this

season. Even if your trees are free of cherry leaf spot, disease management is still necessary after harvest since conditions will continue to persist. Growers are encouraged to apply two postharvest fungicide applications to prevent cherry leaf spot infection. The goal for the remainder of the season is to keep those leaves on the trees and prevent premature defoliation due to cherry leaf spot infection. Tart cherry trees should not be bald in August. This will stress trees setting them up for a weakened condition as they enter the winter months. Many options are available, such as Bravo, Indar, Merivon, and Syllit to name a few.

Cherry Shot Hole Diseases

By: David Clement, UME-HGIC

This year we have had many comments and inquiries about flowering cherry trees with severe leaf spots, yellowing leaves and early defoliation. These very common foliar diseases are collectively called "Shot-Hole diseases" because of the "holes" left behind after the infected spots fall out. This is a catch-all symptomatic phrase and the two pathogens that commonly cause these symptoms are bacterial leaf spot caused by the bacterium, *Xanthomonas pruni*, and cherry leaf spot caused by the fungus, *Blumeriella jaapii*.

Cherry "shot hole diseases" are favored by wet weather in the spring

Both diseases are favored by wet weather and remember this rainy spring. Infected leaves will turn yellow and drop from the trees in mid-summer if infection is severe. These diseases will also continue to infect leaves throughout the growing season if rainy weather persists.

Management involves removal of older heavily damaged or poorly growing trees. Try to adjust tree spacing and use proper pruning to allow better air circulation to promote faster leaf drying and remove fallen leaves in the fall to reduce overwintering pathogens.

On high value trees or trees with a history of severe foliar disease, the use of fungicides may help. Be aware however, that these treatments will only provide preventative disease management or slow down the rate of disease development and will not cure already infected leaves. Therefore early sprays have to start as the new leaves are expanding and continue while rainy periods persist. A practical approach might be to apply two sprays, just as leaves are expanding and again when new leaves have reached full size. This approach will reduce the amount of disease and could give extended control in typical years.

Three fungicides for landscapes include Eagle (myclobutanil), Protect DF (mancozeb) and Cleary's 3336 (thiophanate methyl). Be Sure to Check all Label Instructions. Also, note that commercial orchards have different fungicide labels for edible cherries and these are not interchangeable with landscape usages.

2018 MDA Pesticide Recycling Program

The Maryland Department of Agriculture is offering the empty plastic pesticide container recycling program in 2018. You can view the locations and requirements in the online brochure.

Montgomery County is a new location this year and will also accept clean containers from Prince George's County as well as D.C., as they do not have a collection.

Personal Mosquito Control

By: Stanton Gill

There was a good thread on the entomlogy listserv, Ornent, about Thermacell, a device for localized adult mosquito control, so I decided to test it out. Thermacell is an interesting package. It looks like a portable phone from several years ago in an army green color plastic case that looks like the outdoors. I see you can pick different colors on their websites - not that the mosquitoes would care. It uses the insecticide, Allethrin, on a small pad.

It is a little like buying a computer printer - inexpensive to buy, but the pads and butane cylinder need to be replaced which is where they get you as a repeat customer. You are supposed to only use their products in the machine. It was simple to use. You place a light blue pad, treated with the insecticide, through a slot on the side of the machine. You remove a cap from the butane cylinder and screw it into place. Prime the pump with the butane then the burning butane heats the pad and thru volatilizations the insecticide is emitted as a vapor. The directions tell you to not use it in a tent or enclosed structure - a good idea since you would be breathing in the vapor.

I placed it on a patio table in the backyard. I have two aquatic pools and plenty of mosquito larvae swimming about in them. Adult mosquitoes, at least the species in my landscape, are active mainly at dusk. Before I set up the Thermacell system, I sat on a deck chair reading for 15 minutes and picked up two mosquitoes visiting my bare arms. I am generally not very attractive to mosquitoes and should have called my daughter to come visit since she is a mosquito magnet.

After I established there was mosquito activity on the deck, I primed the device and turned the switch to on position and waited 5 to 10 seconds. According to the directions, you hit a start button (dome-shaped) 3 - 5 times in rapid succession. You check to make sure it is on by checking a lens at the end of the device. If you see a glowing light then, it is on and the application pad is heating. The direction said to leave it on for 10 - 15 minutes. It is supposed to cover 225 sq ft or a 15 ft by 15 ft area. This was at 7:00 p.m. I came back and sat in the deck chair and read via LED light and waited for mosquito activity. Remember what I said, I am not generally highly attractive to mosquitoes. I read for an hour and did not receive any bites. It may be I smell so bad the mosquitoes are not interested or this thing really works. I need to test this out with someone who is highly mosquito prone and see if it holds up. I did not detect any odor from the device and there was no spray emitted. It appears to be solely dispensing by volatility of the insecticide from the heated pads. After four hours the pad turned white color so you can tell when the chemical is used up.

Someone had mentioned foresters clip the device to their belts and go out into the woods. I am not real sure how this would work since it suggests leaving it in place so the vapor protects a set area. If you were walking about I am not sure if you are supposed to be creating some sort of moving zone of vapor. I did see that they sell a $14.95 carrying case so you can clip it onto a back pack or some other bags you are carrying. They also sell a heavy duty version for rough handling out in the field, for a higher price, of course. The replacement pads are $7.95 and the butane cylinder is $9.95. So, if it does work, they get you back buying a regular supply. A pad lasts 4 hours and the butane last 12 hours, according to the brochure.

It's funny that the brochure has picture of a laughing couple sitting next to a wood fire. It appears there are dotted lines forming a tent around them, At first, I thought they were sitting inside a netted tent, but it clearly says do not use in tents or confined areas. I think the dotted tent lines are to show a protective barrier around the couple. I would think the smoke from the fire might be contributing to reduction of mosquitoes at this camp site. It also cautions about not using this product with food sitting out in the open or when grilling.

They also sell a device called the radius zone for $49.99 that runs on a re-chargeable lithium battery.

If you are mosquito prone and want to sit on a deck and drink wine let me know. I have a test site for you.

Expect Poor Fruit Set in Tomatoes This Week

By: Jerry Brust UME

The heat wave we have had over the last week will have repercussions over the next few weeks as the flowers of several crops including cucurbits, peppers and especially tomato will not pollinate or fertilize properly to develop into fruit. Daytime highs of 90 °F and above and nighttime lows only getting down to 70 °F in much of the mid-Atlantic for the last week will cause blossom drop and fruit abortion in tomatoes. Normally, tomato pollination is achieved by the action of the wind. Pollen is released from the tomato flower and falls downward onto the stigma. Without pollination, flowers die and drop. In tomatoes, blossom drop is usually preceded by the yellowing of the pedicel (fig. 1). Tomato flowers must be pollinated within 50 hours of formation or they will die. This is about the time it takes for the pollen to germinate and move up the style to fertilize the ovary. Tomato plants can tolerate extreme temperatures for short periods, but several days or nights with too high of temperatures will cause the plant to abort flowers and fruit (fig. 2). At these high temperatures the pollen can become sticky and nonviable, preventing pollination from occurring and causing the blossom to dry and drop. Relative humidity also plays a role in pollination with high levels (>80% RH) (which we had this week) during pollen shed causing the pollen not to be released properly resulting in poor or incomplete pollination.

Fig. 1 Pedicels of tomato turning yellow prior to aborting
Photo: Jerry Brust, UME

Fig. 2 All of the flowers on these 2 fruit clusters have aborted because of high temperature/ humidity
Photo: Jerry Brust, UME

Most tomato cultivars can make up for this set back of low fruit production with increased flower formation once it cools a bit. It may help to have some cultivars that are better able to take the high temperatures and humidity without as much flower/fruit abortion. Cultivars such as Solar Set, Solar Fire, Sunmaster, Florida 91, Sunchaser for hybrid determinates and for heirlooms Arkansas Traveler, Homestead 24 and Hazelfield Farm are a few but certainly not all the possible tolerant varieties that have been bred to perform better in the heat.

Sawflies on European Hornbeam

Jeff Bright, American Plant Beltway, found sawfly larvae feeding on *Carpinus betulus* 'Fastigiata' in Bethesda. Larvae line up along the leaf edge to feed. When disturbed, they go into an s-shape formation.

Control: Options include Conserve, horticultural oil, and insecticidal soap.

Many sawflies become s-shaped when disturbed
Photo: Jeff Bright, American Plant Beltway

Spider Mites Are Out of Control on Winged Euonymus

By: Stanton Gill

We received two different pictures of winged euonymus with "heavy duty" tetranychid mite damage. The hot weather of the last 10 days has resulted in an explosion of mite activity. If your customer's hedge looks like these plants, then throw in the towel for 2018. You are not greening up the foliage this season. If you have green foliage on a plant, then a miticide would help in addition to the weather getting cooler over the next couple of days.

A very high infestation of mites on winged euonymus is causing heavy webbing and almost all of the plants to turn yellow
Photo: Heather Zindash, Mainscapes, Inc.

Twig Pruners on Oak

Marty Arader, Arader Tree Service, noticed twig pruners on a 40 foot oak tree near Valley Forge in Pennsylvania on July 2. Twig pruners are beetles and are mainly a problem on oak, but have been found on other woody tree species. The adult beetles emerge in spring and lay eggs. The feeding activity of the larvae cause the damage. Many of these damaged tips drop to the ground with the larvae still inside. Picking up these pruned tips helps to substantially reduce the population of beetles and future damage. Beetle larvae can become dislodged from these twigs when they fall to ground and do not survive. Birds are also good predators of these beetles.

Picking up the dead twigs when they fall to ground is an important management method for reducing twig pruner (beetle) populations
Photo: Marty Arader, Arader Tree Service

Rusts Are Still Active

By: Stanton Gill

I was visiting a garden in the northern part of Maryland on the July 4th holiday. I had to shoot pictures of this spectacular 4th of July display of rust on a trellised apple tree. This infection defines a heavy duty year for rust diseases. The last two months of rain have taken their toll.

Infection from cedar apple rust has been high this season
Photos: Stanton Gill, UME

Fall Webworms

Melissa Nash, DNR, found fall webworms feeding on American chestnut on July 5 in Garrett County. In most areas of Maryland, the first generation of fall webworms are getting close to pupating, if they haven't done so already. Monitor populations to determine if control is going to be effective at this time. There are many predators that feed on these caterpillars. It might be better to wait for the second generation to start later this month and use Bt to control the small larvae. Other control options include spinosad (Conserve), Acelepryn, and Mainspring (from Syngenta Company).

The first generation of fall webworms are still active in Western Maryland
Photo: Melissa Nash, DNR

Beneficial of the Week

By: Paula Shrewsbury, UMD

Bombardier beetles: predators with an "explosive" defense of their own!

Ground beetles (Carabidae) are common insects of ornamental and turf environments that are considered to be beneficial. Most are predators as adults and larvae feeding on a wide diversity of insects, slugs, and snails. Some are omnivores eating both prey and seed. The other day I found a ground beetle on my patio and proceeded to move it to a garden bed where food prospects might be greater. Of interest was the odor coming off my hand after handling this beetle. Let's say it wasn't a pleasant smell. It turns out this was a **bombardier beetle**. Bombardier beetles are a group of ground beetles with a very interesting mechanism for defending itself against things that want to eat it (or handle it). There are over 500 species of bombardier beetles and they can

be found in North America, South America, Europe, Africa, and Australia. Preferred habitats are temperate woodlands and grasslands where there is groundcover to provide refuge. Eggs are laid in protected, moist locations such as underground or in decaying organic matter (plants or dead animals). There are several larval instars before the beetles reach adulthood. Bombardier beetles are only about 2.5 cm (1") long as adults. Wings have a bluish coloration and the head, thorax, and legs are an orange – brown color. Both the adults and larvae are predacious, tend to hunt at night, and eat mostly small insects.

Bombardier beetle is a type of ground beetle with a unique defensive mechanism
Photo: Jim Moore, BugGuide #1508545

Bombardier beetles get their name from their unique defense mechanism. When beetles are disturbed or threatened a lightning fast chemical reaction takes place within their bodies that allows them to shoot a boiling hot, irritating, and bad smelling spray from the tip of their abdomen (click for video). However, the bombardier beetle is not harmed. An important feature of that allows for this reaction is the presence of two glands or chambers within the beetle's abdomen each containing a unique chemical, hydroquinones and hydrogen peroxide. When the beetle feels threatened, the contents of these two chambers are combined into a third "reaction chamber" that contains an enzyme (catalyst) that starts the explosive reaction. Although there are multiple steps to this reaction it happens superfast, a fraction of a second. Fast enough to allow the beetle to escape predation (click for video). The tip of the bombardier's abdomen can rotate 270 degrees allowing them to direct the defensive spray at a predator. Beetles store enough of these defensive compounds to expel its spray about 20 times. This defensive spray may be deadly to smaller predators and irritate or scare away larger predators. Humans, like a curious entomologist, don't have to worry. Handling of a bombardier beetle usually results in brown stains on your skin and an unpleasant odor on your hands.

Weed of the Week

Chuck Schuster, University of Maryland Extension

Japanese hops, *Humulus japonicas*, is an annual weed being found in some areas recently. It is a vining plant capable of training of the ground or climbing fences, trees, or other upright objects. It can be identified by its five to nine lobed leaves, and its stem which will be found with downward facing prickles which help it climb. It has been found in landscapes, nurseries and in areas where tree tubes are used. The rough textured leaves are two to four inches in length, will occur with a toothed margin, and will be in pairs. The petioles will be up to eight inches in length, and will have a pair of small bracts at the base where attached to the stem. Flowers are small, the male flower being greenish and being found on a branched panicle, the female flowers are pale green, and will be round, facing downward, with a cone like appearance with scales. The seeds will be round in shape with a blunt tip, light brown in general color and about one eighth on an inch in diameter. This plant is often mistaken for Native Bur Cucumber. Native bur cucumber will present with tendrils that help it climb, and it will not have the downward facing prickles on the stem as does Japanese hops. Caution needs to be considered when handling this plant. Some individuals will show a reaction to the pollen, and others can show dermatitis from contact to the hairs on the stem and leaves, which can lead to blisters.

Japanese hops has leaves with 5 - 9 lobes
Photo: Phil Pannill

Control of Japanese hops can be accomplished by looking at the site itself. Be very cautious about sources of fill dirt or top soil. Usually not found in well shaded sites, and it will not do well in turf. When found in turf, avoid the use of non selective herbicides as this will create a bald site, where the weed can thrive. Japanese hops will grow over grass creating shade, which will kill the turf, so proper regular mowing is extremely important. In nursery settings, small scale problems can be dealt with using scouting and mowing, preventing the need for herbicides. Pre emergence products including Sulfometuron methl (Oust XP), as well as simazine, and imazapic, with the later products having a shorter residual. Pre emergent products should be applied in early March in this region. Non selective, post emergent products are effective, including glyphosate and Metsulfuron methyl (Escort XP) but create a dead or bare area which promotes good seed germination. Of these products Escort XP has shown to be very effective. Garlon and 2,4 D are two other post emergence materials to use for control. Seeds are viable for up to three years. Control efforts need to continue for this length of time to prevent reestablishment.

Japanese hops is a vining plant that can grow over the ground, on fences, and up trees
Photo Courtesy of Harry Monios, Mulch Masters

Plant of the Week

By: Ginny Rosenkranz, University of Maryland Extension

Sargent juniper, J*uniperus chinensis* var. *sargentii*, is a low growing juniper that reaches 1-2 feet tall with a spread of 8-10 feet. These evergreen plants grow best in full sun, moist but well drained soils, and in USDA zones 4-9. Sargent juniper tolerates various soil pH. The juvenile leaves are needle-like in whorls of three that mature to fragrant blue-green scale-like leaves that are set in opposite pairs along the branches in 4 ranks. The female plants produce bluish black berries that attract birds in winter months. Like many other junipers, Sargent juniper is tolerant of deer, drought, air pollution, and erosion. It makes an excellent ground cover, especially on slopes where cutting grass can be problematic. Some of the excellent *Juniperus chinensis* var *sargentii* cultivars include: *'*A. Henry' which is very resistant to juniper blight, 'Compacta' which is shorter, 'Glauca', has bluer green foliage and is even more compact than 'Compacta', and 'Variegata' which has steel blue foliage and creamy white new growth. Pests can include cedar-apple rust, root rot if planted in wet soils, aphids, bagworms, webworms, and scale.

Degree Days (As of July 4)

Aberdeen, MD (KAPG)	1309	Annapolis Naval Academy (KNAK)	1751
Baltimore, MD (KBWI)	1638	College Park (KCGS)	1577
Dulles Airport (KIAD)	1625	Frederick (KFDK)	1563
Ft. Belvoir, VA (KDAA)	1707	Greater Cumberland Reg (KCBE)	1498
Gaithersburg (KGAI)	1564	Martinsburg, WV (KMRB)	1498
Natl Arboretum.Reagan Natl (KDCA)	1892	Salisbury/Ocean City (KSBY)	1666
St. Mary's City (St. Inigoes, MD-KNUI)	1754	Westminster (KDMW)	1660

This week, the site for degree days was not functioning as it has been. The steps below might not work at this time. We are checking into the situation. We are now using the Weather Underground site for degree days. It changes some of the locations available.

1. Enter your zip code (not all locations are included, check nearest weather station to your site) and hit enter
2. Click the "custom" tab/button below the date
3. Enter the start date below the word "from" (ex. Jan. 1) and the end date below the word "to" (current date)
4. Hit the get "history" button
5. Read your growing degree days (base 50) in the 'Sum' column (=Cummulatlive DD to date for the year)

CONFERENCES

Turfgrass Research Field Day
July 18, 2018

12:30 – 1:00	Registration and Posters
1:00 – 4:00	Walking tour Presentations: Selecting Improved Varieties Cultural and Chemical Management of Weeds and Disease New Research on Implementing Biological Control
4:30	Dinner at Facility

Location: UMD Turf Farm, College Park, MD

The following credits are available for Recertification.
MD Pesticide Applicators - 8 Credits: Categories 3A(Ornamental-Exterior), 3C (Turf), 6 (Right of Way and Weed), and 10(Demonstration and Research)
MD Professional Fertilizer Applicator - 2 credits
DE Pesticide Applicator - 4 Credits Categories PA (Core or Private Applicator) and 03 (Turf and Ornamental)

To register:
https://psla.umd.edu/field-day#overlay-context=about/turfgrass-field-day-registration

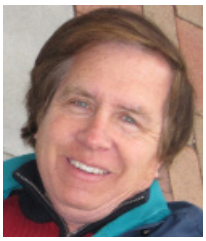
PGMS Green Industry Field Day
July 19, 2018
Location: American University, Washington D.C.
Contact: info@pgms.org

Cut Flower Operation Tour
September 12, 2018
Location: St. Mary's County (Loveville and nearby sites)
Details will be available later in the summer

New Plants for Nursery Growers
October 25, 2018
Location: Country Springs Nursery, Woodbine, MD
Details will be available later in the summer

Conference information is posted at:
http://extension.umd.edu/ipm/conferences

CONTRIBUTORS:



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