BUCKEYE YARD AND GARDEN LINE 2015-15
07/16/15

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This is the 15th 2015 edition of the Buckeye Yard and Garden Line (BYGL). BYGL is developed from a Tuesday morning conference call of Extension Educators, Specialists, and other contributors in Ohio.

*****HOW TO: BUCKEYE YARD AND GARDEN LINE SUPPORT. The Ohio State University (OSU) Buckeye Yard and Garden Line (BYGL) writers need your support to continue this newsletter. OSU puts a great deal of resources into this project and we do not receive funding necessary for full support. We know you like BYGL, as in the 2014 Reader's Survey respondents indicated BYGL saved them $2.45 million dollars, 96% indicated BYGL was useful in their jobs, and 87% indicated BYGL helped with their diagnostic skills.

Funds will support on-going work of the Ohio State University Extension Nursery Landscape and Turf Team in matters regarding preparation, compilation and travel for the weekly April-October BYGL e-newsletter. Expenditures will include but not be limited to equipment such as cameras, upgrades of computers and related devices, management of the website, editing and webinar costs, and travel reimbursements.

Here's how you show your support:

This is the direct link to the OSU giving site: [http://go.osu.edu/byglsupport].

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Also, if you would like to make a larger gift, please contact Jennifer Heller ([heller.4@osu.edu]), the Director of Development for the OSU College of Food, Agricultural and Environmental Sciences with your name and contact information. Jennifer's cell phone number 614.975.1317 and she will be more than happy to speak with you.

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1. PLANTS OF THE WEEK.

*ANNUAL - LANTANA (Lantana spp.) Lantana is native to the tropical Americas and Africa and is in the Verbenaceae Family. In Ohio, it is grown as a garden annual and is valued for its long season of reliable blooms. In the south, from Florida to California, Lantana is grown as a perennial shrub of 3 - 6’ tall. Many cultivars display multiple colors within each 2” wide disc shaped flower head. Lantana adds color and form to annual beds and container plantings throughout the summer and comes in a wide variety of sizes, from 5 - 6’ upright clumps to 12” high weeping plants that spread to 4’. Many new varieties have entered the market in recent years, giving the gardener many options on size of plant, bloom colors, and growth habits. The weeping forms are wonderful for trailing over the edges of planters and walls. The colorful flowers attract butterflies and hummingbirds. They are generally low maintenance, growing vigorously in full sun. Once established, they are quite drought tolerant and require little fertilizer. A light fertilization in spring will usually be sufficient. They do well in most soil types, as long as they are slightly acid. If plants outgrow their assigned space, they tolerate trimming back during the growing season.

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*PERENNIAL - SWAMP MILKWEED (Asclepias incarnata). Swamp milkweed is an ideal plant for the butterfly garden, is favored by monarch butterflies, and is a great nectar source for other butterflies and hummingbirds. This plant, which is otherwise known as rose milkweed, pleurisy root, white Indian hemp, can reach heights of 2 - 6’ tall. Flowers can be bright pink, white and purple and appear throughout the summer. Swamp milkweed spreads through rhizomes and seed that are attached to fluffy hairs which help them spread by wind dispersal. It prefers neutral to slightly acidic soil, although it will tolerate a pH up to 8.0. This plant, as the name implies, grows well in swampy areas but can grow just fine in clay based soils. Swamp milkweed needs full sun or partial shade to thrive. Plants should be divided in spring every few years to keep them manageable and healthy.

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*WOODY - ROSE OF SHARON (Hibiscus syriacus). Blooming this week in Columbus is the Rose of Sharon, a vase-shaped, hardy deciduous shrub which is not a rose but a hibiscus in the Malvaceae or mallow family. Also called shrub althea, you may have noticed the wide variety of flower types from single to double and the wide range of colors from white to red to blue to purple each with a dramatic contrasting color in the center of the bloom. Look closer to see butterflies and hummingbirds hanging out on this multi-stemmed shrub.

Rose of Sharon is a versatile, low maintenance woody that is adaptive to most soil types as well as both acid and alkaline soil pH. It is both an old and new garden favorite due to the many cultivars available today. Carefully review your choices when selecting which cultivar will suite your needs as sizes can
range from 6 - 10' and with a variety of growing options. The Rose of Sharon can be allowed to grow naturally or as a specimen shrub or pruned as a tree. It can also be trained in espalier or planted in a group as a hedge or natural barrier.

When selecting a cultivar, consider if they are heavy re-seeders or sterile so you will not have volunteer plants in your beds. One cultivar that produces few seed pods is 'Minerva' which has large lavender flowers with dark red centers. Other cultivars to consider are 'American Irene Scott' SUGAR TIP with its double soft pink flowers; 'Aphrodite' with vibrant pink flowers with a dark red eye; or 'Diana' which prefers hot dry garden areas and has white flowers. Explore the many cultivars before planting this hardy, well-loved shrub.

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* VEGETABLE - SWISS CHARD (Beta vulgaris subsp. cicla). Looking to bring a little bit of zing and color into the garden while also providing a serving of vegetables? Well then, Swiss chard is the perfect blend of eye popping colors combined with something good to eat! Swiss chard is a very easy plant to grow and harvest, especially if there is a real preference for eating and enjoying a highly nutritious, spinach-like vegetable. Chard, a close relative of the beet, is grown for its vitamin-rich leaves and leafstalks (petioles), rather than an enlarged root; however, like beets, chard "seeds" produce multiple seedlings and therefore, thinning them is required. Thin chard seedlings to about 12" apart to allow plants to grow to their mature size, which is about 2 - 3' tall. Seedling plants, removed when thinning, are a wonderful addition to any salads. Swiss chard leaves can be harvested and used as soon as they are an appropriate size for use, which is approximately when the leaves are 7-12" tall. Chard may be harvested throughout the entire growing season, right up until the killing frost. Remove the outer-most, larger leaves, cutting them about 1" from the soil surface with a sharp knife. Try to avoid damaging the inner-most area where the new leaves and stems continuously emerge from the growing center. Harvested chard can be stored unwashed in the refrigerator for a few days. The leaves and petioles can all be cooked, prepared, or utilized just like spinach.

There are many cultivars available: like those with red petioles ('Burgundy', 'Rhubarb', 'Ruby Red'); white petioles ('Fordhook Giant', 'Geneva', 'Large White Ribbed', 'Lucullus', 'Perpetual', 'Winter King', 'Virgo', 'Bionda di Lyon'); yellow petioles ('Bright Yellow', 'Gold Stem', 'Pot of Gold'); magenta petioles ('Magenta Sunset'), or a mixture of red, pink, orange, purple, white, and yellow petioles ('Five Color Silverbeet', 'Rainbow', 'Bright Lights', 'Neon Lights', 'Northern Lights'). Now your eyes can be served a colorful treat too, while your tastebuds are enjoying swiss chard!

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*WEED - FOXTAIL (Setaria spp.). There are 3 species of Setaria foxtails that are now becoming very apparent in Ohio. These include: YELLOW FOXTAIL (S. lutescens), GREEN FOXTAIL (S. viridis), and GIANT FOXTAIL (S. faberii). The foxtails are clump-forming, wide bladed, erect grasses. Their most recognizable feature is their spike-like panicle seedheads that resemble the tail of a fox.

Yellow foxtail is easily identified by its yellowish, bristly, erect seedhead. The seedheads on green and giant foxtail are larger and come in shades of green and purple. Giant foxtail can be distinguished even further by its nodding character and large-sized plants; this foxtail can rapidly grow to over 3' in height making it a serious landscape and nursery weed. While both green and yellow foxtails may grow to over 1' in height, frequent mowing can cause plants to develop prostrate growth habits making these foxtails serious turfgrass weeds.

These foxtail species are summer annuals that produce relatively compact root systems. Since most of the plant's energy is directed towards seed production and these seeds can germinate over the entire summer, control of this weed can be difficult. A combination of cultural and chemical controls is recommended. Most pre-emergent herbicides are effective in controlling foxtail if applied at the recommended time and rate. Effective management strategies at this time of the year include hand and
mechanical cultivation, mechanical seedhead removal (e.g. mowing), and post-emergence herbicides. It is important to remember that while post-emergence herbicides will kill the plant, any viable seed within the seedhead will not be killed and the seed can germinate next year. If you do choose to use an herbicide, be sure to follow and read all label directions.

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2. HORT SHORTS.

A. A WALK ON THE WILDSIDE: BATS MAKE PIT STOPS, TOO. Many homeowners are aware that several species of Ohio bats form colonies during the summer. Sometimes these colonies are in barns, attics, behind shutters, or in bat houses. Evidence of these colonies is often marked by small (or large in the case of a large colony) piles of guano (bat feces). But occasionally, a mere scattering of guano will be found under patio umbrellas, window or door awnings, and other sheltered places around the home. This guano may at first be mistaken for a rodent's feces, as the size and shape is very similar. But close inspection will reveal white and sometimes colorful flecks of insect exoskeleton within the small pellets. If a guano pellet is crushed it will break apart easily, unlike rodent feces.

Don't worry; it's unlikely a new bat colony has moved in underneath the patio umbrella or window awning. The truth of the matter is that during a long night of feasting on insects, a bat needs to stop and take a couple of breaks to let the food digest and well, make room for more food! That small smattering of guano on the ground is likely the result of a single bat's nightly pit stop. Homeowners wanting to encourage a bat to keep moving to the next rest stop can simply exclude the bat from the area. One of the easiest ways is to use netting or screening and cover the underside of the awning or umbrella, thus eliminating access. Leave the screening up for 7 - 14 days, which is usually enough time for the bat to find another area for its nightly pit stops.

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B. A WALK ON THE WILDSIDE: WHAT IS THAT BUTTERFLY EATING?? It's common to see a beautiful butterfly land on a flower and begin delicately sipping the sweet nectar inside. Believe it or not, it's also common to observe a butterfly sipping liquids besides nectar. Butterflies also dine on sap, overripe fruit, rotting vegetables, carrion (road kill), and even…poop! Yes, those beautifully colored, delicately built insects fluttering about in the sunshine also gain nutrition from the excrement of other animals! Butterflies are fluid feeders and many visit flowers for the sugar-rich nectar. Yet others rarely visit flowers, preferring to feast on the liquids and dissolved nutrients produced by other food resources that are, let's be frank, rather unappealing to us humans.

So which species of butterflies dine on not-so-tasty vittles? Both the EASTERN COMMA (Polygonia comma) and QUESTION MARK (Polugonia interrogationis) feed on sap and rotting fruit, but the question mark also feeds on carrion and feces. The MOURNING CLOAK (Nymphalis antiopa), a beautiful purple-black butterfly with cream colored outer wing margins will occasionally visit flowers but much prefers tree sap, especially oak sap. The mourning cloak also has a unique life cycle. It overwinters as an adult in tree cavities and beneath loose bark, emerging early in the spring to mate. The RED ADMIRAL (Vanessa atalanta) will visit flowers when its preferring foods - sap, fermenting fruit, and bird droppings - are not available. Finally, the lovely RED-SPOTTED PURPLE (Limenitis arthemis), while often seen lighting upon flowers, also dines on rotting fruit, sap, carrion, and feces.

Homeowners looking to attract butterflies to their backyards and landscapes can do so by planting nectar rich flowers, but also by providing other food sources. No, I'm not advocating the addition of feces feeding stations to your backyard, but rather fruit feeding stations. How many of us have thrown away the brown banana that sat on the counter for too long? What about the cantaloupe or strawberries that don't smell so fresh anymore? Old or rotting fruit can be placed outside, near flowers, on a small tray for butterflies. Be sure to bring the tray in at night as other critters like raccoons and skunks, will also be tempted.
C. APRIL SHOWERS BRING MAY FLOWERS. But what can we expect from June downpours, followed by July storms? Consistent rains sprinkling the Midwest have created a challenging environment for most plants, which rely on macropores in the soil to supply roots with oxygen. Without time to drain adequately between rainfall events, soils may become waterlogged so that the pockets of oxygen - the macropores - are filled with water. Roots can suffocate and die, leaving plants no mechanism for nutrient or water uptake. Plants with drowned root tissue may appear wilted, yellow, or just plain dead!

The question is: will my plants recover from flood damage? The answer, of course, is: it depends. Species tolerance and duration of soil saturation impact a plant’s ability to recover from flood damage. Some plant species are more tolerant of low-oxygen soil conditions, so that they are less susceptible to root drowning. Soil structure and topography of the land influence drainage rate, so that some areas drain quickly even with heavy rain. Plants rooted in well-drained, sandy soils are less likely to show symptoms of drowning.

Wet weather can lead to other issues in the garden as well. Many weeds have seeds requiring water to germinate and disperse. With continued rainfall, weeds have plenty of opportunity to sprout while gardeners cannot get out and manage populations. Excessive rainfall also creates favorable environments for development and dispersal of a wide variety of plant pathogens. As the season progresses and disease symptoms appear on plants, remember that most plant disease cannot be cured once symptoms develop. It is best to prune out infected plant tissue to try to prevent disease from developing further.

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3. BUGBYTES.

A. YELLOW CATS MEOW. Amanda Bennett showed BYGLers images of late instar YELLOWNECKED CATERPILLARS (Datana ministra) defoliating a 10' tall maple in western Ohio. The caterpillars are general defoliators and may be found consuming the leaves of a wide variety of trees and shrubs including: beech; boxwoods; crabapples and other ornamental fruit trees; elms; hickories; honeylocust; maples; and oaks. Yellownecked caterpillars have black heads and a yellowish-orange "neck," or prothorax, which gives them their common name.

The caterpillars pass through 3 distinct "color phases" during their development meaning the caterpillars change their colors and markings as they mature through different larval instar stages. The first instars are usually described as yellowish to copper colored with a faint, dark medial line down their back. Middle instar caterpillars have distinct alternating longitudinal yellow and orangish-red lines. The final color phase is observed on last instar caterpillars which have alternating longitudinal black and yellow lines. Although all instars have hairs, the hairs are most evident during the last instar stage.

Yellownecked caterpillars feed in groups, or "colonies," throughout their development. Colonies may include 10 - 30 caterpillars. When disturbed, colonies of caterpillars have the interesting habit of rearing their front and tail ends in unison presumably to ward off predators. First instar caterpillars often go unnoticed since they only skeletonize the leaf epidermis. Damage becomes more apparent when the caterpillars reach the second instar stage and consume most of the leaf, except for the midvein. Later instar caterpillars devour whole leaves, often including the petiole. Since the caterpillars are gregarious feeders, defoliation tends to occur one branch at a time, unless populations are high and multiple colonies are feeding on many branches. There are normally 2, and sometimes 3 generations in Ohio.

The caterpillars can be suppressed using standard appropriately labeled insecticides. However, an alternative method that will preserve beneficial insects is to knock the colonies into a bucket of soapy
water where they will drown, or onto the ground where they can be dispatched by doing the "caterpillar two-step" dance. Thus far, no caterpillar populations have become resistant to foot suppression.

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B. OLEANDER APHIDS. The common milkweed (Asclepias syriaca) insect menagerie reported in BYGL 2015-13 (07/02/15) was joined this week in southwest Ohio by oleander aphids (Aphis nerii). Finding this non-native aphid sucking juices from common milkweed as well as other members of the genus such as butterfly weed (A. tuberosa) is not surprising considering that recent taxonomic changes now place oleander (Nerium oleander) and milkweed in the same family; the dogbane family, Apocynaceae. Milkweed was previously classified in the family Asclepiadaceae, but it is now classified as belonging to the subfamily Asclepiadoideae within the dogbane family. Of course, this was apparently something the aphid knew all along!

Oleander aphids are parthenogenetic meaning that there are no males; all the aphids of this species are females. The brightly colored yellow to yellowish-orange females may be winged or wingless. The wingless form has black legs, antennae, and cornicles which are the 2 "stovepipes" on top of the back-end of the abdomen. The winged form is similarly colored but the wing veins and the top of the thorax are black. Oleander aphids are often considered a late-season aphid with high populations generally appearing in late-summer. However, the aphid will sometimes appear in large numbers earlier in the season where populations were high the previous season.

The sap of oleander and milkweeds contains cardenolide glycosides (heart poisons). These are very serious toxins. As with a number of other insects that feed on plants in the dogbane family, the aphid incorporates the glycosides into their flesh as protection against predators. It is speculated that the bright coloration of the aphid warns predators against taking a taste. This is called "aposomatic" or "warning" coloration. Research has shown that predators that dine on insects protected by cardenolide glycosides suffer a range of malevolent maladies including death. Nature teaches tough lessons.

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C. A BEAUTIFUL BEETLE. Joe Boggs reported observing one of the most beautiful beetles found in Ohio. The beetle lacks a common name, but is generally referred to as the "DOGBANE BEETLE" because it primarily feeds on dogbane. The beetle's scientific name is Chrysochus auratus, which loosely translates to "made of gold."

Indeed, these beautiful iridescent beetles may look like shimmering spots of gold on the leaves of dogbane, or they may blaze with an array of other colors depending on the viewer's angle to the beetle. A slight change in viewing angle will cause the beetles to glisten with multiple shades of green, copper, blue, and red. The secret to this gallimaufry of colors can be found just below the surface of the exoskeleton. Beneath an outer translucent layer rests stacks of tiny slanting plates that cover color pigments. Light rays that strike the surface of the plates are reflected as a shimmering sheen, while light rays that bounce off the pigments produce an array of colors. The result is a lustrous mix of ever-changing hues; a kaleidoscope of colors that are almost unmatched in the insect world.

The beetles are found during the day feeding and resting on dogbane leaves. They are not picked-off by predators because the beetles have a nasty chemical defense strategy. Like common milkweed, dogbane has milky sap that contains poisonous alkaloids (cardiac glycosides). The beetle ingests the cardiac glycosides, stores them in glands, and then secretes them when threatened by predators. This is different from the chemical defense strategy employed by the aforementioned oleander aphid and other insects that feed on milkweeds. However, the results are the same with their bright coloration advertising their ability to wage chemical warfare against predators. Pay close attention to areas with dogbane to see these iridescent spots of gold.

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D. STRAFING HORSEFLIES. Joe Boggs reported that he and a few participants in this week's S.W. Ohio BYGLive! Diagnostic Walk-About were strafed by a maniacal HORSE FLY (*Tabanus* spp.). There are several species of horse flies in Ohio ranging in size from 3/8 - 1 1/8" in length. All are aggressive and vicious biters, but the bigger ones are particularly menacing. Female horse flies require blood meals to be able to produce eggs. When she finds a host, the female uses her sharp, knife-like mouthparts to slash open a wound in the skin; the mandibles of large horse flies are powerful enough to cut through tanned leather! After opening a wound, the female injects saliva that has anticoagulation properties and she then laps up the free flowing blood. The bite is extremely painful, and blood continues to flow from the wound even after the female finishes feeding.

Horse flies have specialized vision that allows them to see heat; they literally use thermal imaging to locate their hosts. The flies are also able to track large moving objects, particularly dark colored objects, even while the flies are in fast flight. Taken together, their visual acuity allows them to effectively zero in on large, savory, warm blooded animals like cows, deer, diagnostic walk-about participants, and of course, horses. Unfortunately for the flies, dark colored moving cars warmed by the summer sun looks to them like a dark, galloping horse leading to catastrophic consequences ... for the flies ... with the last thing passing through the fly's minds being their rear ends.

There are a number of things you can do to keep yourself off the horse fly menu. If possible, avoid horse fly habitat. Their larvae feed on decaying organic matter in moist soil, so horse flies are frequently found in swamps or near streams and ponds. If you can't avoid their habitat, schedule your activities to avoid the flies. Horse flies are active during the day; they can't find their hosts at night. So, evening pool parties will be free of horse flies. If you must venture into horse fly habitat during the day, remain alert and take precautions. Most flies are silent flyers while horse flies produce a loud, buzzing sound. When you hear the buzz, locate the fly because horse flies love to land stealthily for a quick bite. However, avoid running; remember that horse flies are attracted to moving objects! Wear light clothing; dark clothing is like wearing an "eat hear" sign. Finally, while insect repellents that contain DEET or picaridin may provide some protection, horse flies are very good at finding unprotected skin. Long sleeves, long pants, and neckerchiefs can help to thwart the flies.

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E. WINDSHIELD WIPES. BYGLers also ran into a few other insect pests this week including:

* Joe Boggs reported that big beetles are beginning to show up at porch lights, screen doors, and sidewalks around Ohio. Two common representatives of these big beetles are the STAG BEETLES, sometimes called 'Pinching Bugs' (*Psuedolucanus* spp. and *Lucanus* spp.), and the SPOTTED GRAPEVINE BEETLE (*Pelidnota punctata*). Stag beetles are brown to black and range in size from 3/4 - 1 1/4" in length. They are so named because of the large stag horn-like branching mandibles of the males. No significant plant injury is attributed to the adults. Spotted grapevine beetles are tan to tan-orange in color and about 1" in length. They have six black spots arranged along the edge of their wings. The beetles can be found feeding on grapevine leaves, but they cause little damage. The immature stages of both types of beetles are huge, white, grub-like larvae that live and feed in well-rotted logs and stumps. Neither beetle requires management.

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* Although JAPANESE BEETLE (*Popillia japonica*) adults will feed on a wide range of plants, wild and cultivated grapes are generally considered one of the beetles preferred hosts. However, Denise Johnson and Joe Boggs reported that they are commonly finding beetles feeding on other host plants and snubbing nearby grapes. Denise noted that beetles were hammering an ornamental plum in her landscape, but not touching (chewing) the leaves of her grapes. This is the second week that Joe reported finding large numbers of beetles skeletonizing wild black willow leaves but ignoring wild grape growing a few feet away. His observation presented a special diagnostic challenge because the willows
were also infested with IMPORTED WILLOW LEAF BEETLE (*Plagiodera versicolora*); the leaf skeletonizing larvae produce symptoms that are almost identical to Japanese adult feeding damage. Reasons for Japanese beetles ignoring grape are not known. Of course, there’s no accounting for taste.

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4. DISEASE DIGEST.

A. A DUSTING OF ‘DEWS. Reports are beginning to come into Extension offices regarding the appearance of Powdery Mildew (PM) fungi on their host plants. Most people do not understand that it requires different species of PM fungi to cause the symptoms of disease to appear on different plants. For example, the spores of fungus which cause PM on lilac, can literally fall upon and cover the rose plant growing near it which will never be infected by that specific fungus! This is not to say that the rose plant will never be infected by PM because there is a species of PM fungi which will infect roses. Most often these fungi tend to infect either plants in the same family or just one species of plant.

All PM fungi are obligate parasites, meaning that they require living plant tissue upon which to grow and reproduce. There are several different genera of fungi which cause powdery mildew. On perennial hosts, such as lilacs, PM survives from one season to the next as vegetative strands in buds or as spherical fruiting bodies, called chasmothecia (previously called cleistothecia), on the bark of branches and stems. In spring or early summer, these airborne spores initiate primary infections on susceptible leaves. PM fungi most often appear as the thin layers of white mycelium, composed of masses of fungal hyphae, growing on the surface of the infected plant. However, unlike most fungal pathogens, PM fungi grow primarily as external or superficial diseases essentially on the surface of plant tissues. PM fungal hyphae are produced during the growing season on both upper and lower leaf surfaces; however, some species of PM are restricted to one leaf surface only. Infections of PM may also occur on stems, flowers, or fruit. Although the PM fungus grows primarily as an external disease on the leaf, it does develop specialized absorption cells called haustoria, which penetrate into the plant epidermal cells, to obtain or extract nutrients from the leaf.

As the mycelial colonies expand and mature, spores may develop in chains on upper or lower leaf surfaces but also on affected herbaceous stems, flowers, and fruits. As the spores are released, winds carry the PM spores to new hosts. Although relative humidity requirements for germination of PM spores vary depending on species, all PM species can germinate and infect susceptible tissues in the absence of free water. In fact, water on plant surfaces for extended periods of time will actually inhibit germination and can kill the spores of most PM fungi! The PM fungi prefer temperatures of 60 - 80 F and shady conditions typically favor PM development. PM spores and mycelium are sensitive to both extreme heat and sunlight, and leaf temperatures above 95 F are detrimental to the fungus.

The best method of control for PM is prevention. Excellent cultural practices like avoiding those cultivars of plants which are highly susceptible, placing plants in full sun, spacing plants apart to allow good air movement to quickly dry the foliage, often will adequately control PM in many landscape situations. Regardless, some prized ornamentals do require protection with preventative fungicidal sprays; principally, when conditions favor PM development, especially on those plants highly desired for their visual appeal, yet are highly susceptible like some hybrid tea roses, Beebalms, Spireas, Lilacs, and Zinnas.

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5. TURF TIPS.

A. WHITE GRUB PREDICTION. BYGLers discussed the distinct possibility that this could be a very "good year" for white grubs in many areas of Ohio. First, localized JAPANESE BEETLE (*Popillia japonica*) populations are very heavy in some areas of the state and adults are no doubt still appearing on the scene. Second, adult populations of both the NORTHERN MASKED CHAFER (*Cyclocephala*
borealis) and the SOUTHERN MASKED CHAFER (C. lurida), 2 of our other common "white grub producing" beetles, have been very high this season, particularly in the central and southern parts of Ohio. Indeed, Joe Boggs reported that an inordinate number of northern chafers came to his porch lights earlier in the season followed now by an equally dramatic number of southern chafers. The onslaught from both beetles has made evening porch sitting a challenging endeavor!

Finally, soil moisture has remained high throughout the state, and has almost constantly been recharged. Both Japanese beetles and the masked chafers lay dehydrated eggs that must absorb water from the soil in order to develop, so wet soil conditions support a greater egg hatch which means more white grubs. Thankfully, it's perfect timing for applying one of the standard grub control products such as imidacloprid (e.g. Merit), thiamethoxam (e.g. Meridian, Maxide), clothianidin (e.g. Arena), or chlorantraniliprole (e.g. Acelepryn). However, dinotefuran (e.g. Zylam) should be delayed since the recommended timing for applying this insecticide for white grub control is early August.

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B. TURF TIPS VIDEO. Todd Hicks and Joe Rimelspach discuss the effect of constant moisture on turf including leaf spot, red thread and slime mold. Listen to their discussion at: [https://otf.sitemym.com/news/240969/Turf-Tips---July10-2015.htm]

6. INDUSTRY INSIGHTS.

A. CASE STUDY: CHLOROTIC BLUE SPUCE. Participants in June's S.W. Ohio BYGLive! Diagnostic Walk-About at Stanley Rowe Arboretum came across a very peculiar case of inner needle yellowing (chlorosis) on Colorado blue spruce. Stem growth rates for all years, including this year, appeared normal. Likewise, foliage on this season's growth was normal; the needles were a beautiful deep silvery blue. Based solely on the appearance of the new growth, the affected blue spruces would be deemed "shiners!"

However, the chlorosis symptoms were dramatic. Needles on all previous year's growth were yellow; sometimes an intense aureolin (= cobalt yellow) color. The extent of the chlorosis was made even more apparent because of the acute contrast with the normal coloration of this season's needles. A close examination of the chlorotic needles revealed that the some needles, particularly those on last season's growth, had faint green horizontal banding. Readers who receive the BYGL by e-mail can see images of the symptoms by visiting the online version of the BYGL at: http://bygl.osu.edu/

Walk-About participants posited a number of diagnostic possibilities including a nutrient deficiency, but which nutrient? And, was the nutrient deficient in the soil or was the soil pH making the nutrient unavailable to the trees, or was it both? As was noted in last week's BYGL (see "Leaf Chlorosis on Trees," 2015-14 (07/09/15)), it's easy to make a quick, speculative diagnosis; it takes more time and requires more work to make an accurate diagnosis. Of course, much was riding on a correct diagnosis: the chlorotic condition was creeping into a one-of-a-kind collection of blue spruce propagated from a witches' broom found in Colorado. Indeed, Rowe Arboretum is designated as a Conifer Reference Garden by the American Conifer Society.

Chris Daeger, Manager of the Arboretum, sent both soil and needle tissue samples to CLC Labs in Westerville. The wisdom of having both a soil test and needle tissue analysis performed is revealed by combining the two results to arrive at an accurate diagnosis and a correct cost-effective course of action.

Soil Test: the soil test provided several helpful pieces of information as well as one possible "red herring." First, the soil pH was 6.8 which was very surprising given the propensity for soils in southwest Ohio to be alkaline. This provided a clear demonstration of the value of having the soil tested rather than relying on "conventional wisdom." The pH value eliminated the likelihood that soil alkalinity or acidity was making a nutrient unavailable to the spruce trees. Second, most micro and macronutrients were in
an acceptable range except for Manganese (Mn), Zinc (Zn), and Phosphorus (P). These plant nutrients were all at the very bottom of the "Low" range; however, the soil test alone did not answer exactly which nutrient was responsible for producing the needle chlorosis. Also, since P is a macronutrient meaning the plant has a higher usage rate compared to micronutrients (e.g. Mn and Zn), the soil test results alone may have led to the conclusion that a P deficit was the culprit; a red herring.

Tissue Analysis: this test revealed that P in the needles as actually "sufficient" meaning that despite the low level of P in the soil, the tree was managing to extract a sufficient amount to provide for the needs of the foliage. Of course, the low P level in the soil must still be addressed with targeted applications. All nutrients were found to be sufficient in the needles except Zn which was "Low" (result 32; normal range 35 - 65) and Mn which was "Very, Very, Low" (result 129; normal range 500 - 1000); the true culprit was revealed! The Mn deficit in both the soil and the foliage also fit with the observed symptoms. This nutrient behaves in an odd way in spruce. If Mn is deficient, the tree will rob Peter to pay Paul by shifting Mn from the older foliage to the new foliage, thus producing both the chlorosis and the odd green banding pattern observed on the older needles.

There are two important take-home messages from this case study. First, as Chris noted when he reviewed the results, he now has a clear pathway for correcting the chlorosis condition and keeping his trees healthy; he will be purchasing and making targeted applications of phosphorus and manganese. While the soil test and tissue analysis cost time and money, the results mean he will not be wasting time and money making P and Mn applications. More importantly, without the test results, he would have been shooting in the dark and spending time and money hoping he hit the target!

Second, does this case study demonstrate that inner needle chlorosis on blue spruce is always caused by a Mn deficiency in the soil? No! While the symptoms may match a Mn deficiency, without a soil test, there is no way to know whether or not the soil is actually deficient in Mn or if there is plenty of Mn in the soil but the soil pH is making Mn unavailable to the trees. The tissue analysis illuminated what was actually happening with Mn as well as other nutrients inside the tree. It played a vital role in answering the final questions leading to an accurate diagnosis and plotting a cost-effective course of action to solve the problem. Don't guess …test!

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7. WEATHERWATCH. The following weather information summarizes data collected at various Ohio Agricultural Research Development Center (OARDC) Weather Stations spanning the dates from July 1 – July 15, 2015, with the exception of the soil temperatures which are readings from Wednesday, July 15, 2015 at 8:00 a.m.

What would a weather report this year be without the mention of rain. Each of the weather stations are recording above average precipitation levels.

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<td>1.5&quot;</td>
<td>68.39/67.44</td>
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<tr>
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<td>58.9</td>
<td>2.69&quot;</td>
<td>2.1&quot;</td>
<td>70.56/70.53</td>
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<tr>
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<td>NW</td>
<td>77.2</td>
<td>58.7</td>
<td>4.68&quot;</td>
<td>1.8&quot;</td>
<td>69.99/68.11</td>
</tr>
<tr>
<td>Columbus</td>
<td>Central</td>
<td>79.2</td>
<td>62.7</td>
<td>3.67&quot;</td>
<td>2.1&quot;</td>
<td>73.13/73.48</td>
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<tr>
<td>Piketon</td>
<td>South</td>
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<td>80.1</td>
<td>3.97&quot;</td>
<td>1.8&quot;</td>
<td>72.36/73.31</td>
</tr>
</tbody>
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For a link to the OARDC Weather Stations, visit: http://www.oardc.ohio-state.edu/centernet/weather.htm

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8. COMING ATTRACTIONS.
A. SAVE THE DATE - NORTHWEST OHIO GREEN INDUSTRY SUMMER SESSION - AUGUST 5, 2015. The event will once again be held at Owens Community College. Stay tuned for a link to the registration materials.

B. WILDLIFE NUISANCE CLASS. Are you having issues with wildlife such as deer munching on your landscape, raccoons rooting in your planters, chipmunks nibbling on your tomatoes, or bats in your home? Register for THE GOOD, THE BAD, AND THE HUNGRY: DEALING WITH WILDLIFE CONFLICT IN THE LANDSCAPE on August 7, 2015 in Lucas County. This is a day-long class, $35 per person. Participants will learn strategies for preventing and managing conflict with deer, rabbits, squirrels (chipmunks, tree squirrels, groundhogs), raccoons, skunks, bats, Canada geese, moles, voles, and coyotes. Lunch is provided as well as a folder full of additional information. Visit [http://www.woodlandstewards.osu.edu] to learn more about the class or register online at [https://www.regonline.com/wildlifeconflictsLucas].

C. TREE TOUR & TALKS - AUGUST 25, 2015. Have you ever seen a Kinki Winki? Or a Zydico Twist? Join us for an opportunity to see an amazing collection of rare and unusual trees on this tour of a private property, "Barboretum". Afterward, enjoy lunch and the presentations of our 3 renowned speakers. Everyone is welcome and Master Gardeners receive 5 CEUs. This event will take place in Miami County, in Tipp City. Contact Deb Castle at debcastle@live.com or 937-409-1582 to register. Cost is $60 per person.

D. THE OSU GREEN INDUSTRY SHORT COURSE, THE OHIO TURFGRASS FOUNDATION CONFERENCE AND SHOW, AND TREES ON TAP PROGRAMS. Mark your calendars now, as these shows will be here sooner than you think. The event will be moving back to the Columbus Convention Center in 2015 and will be held on December 8 - 10, 2015, with the addition of a special tree program on Monday, December 7, 2015. Details on over 100 educational programs and a wide array of certification credits will be coming throughout the BYGL season. We are happy to acknowledge the robust support of the Ohio Turfgrass Foundation for their financial and other aid of the educational efforts of the OSU Extension Nursery Landscape and Turf (ENLT) Team, a group of Extension Educators and OSU Specialists that brings to you a range of programs including field diagnostic walkabouts (such as BYGLive! in southwest Ohio) and diagnostic workshops as well as help with horticulture problem troubleshooting, numerous publications, and of course, the BYGL.

A key speaker for both the Trees on Tap program and the tree care track of the Green Industry Short Course will be Dr. Ed Gilman of the University of Florida Environmental Horticulture program. Ed is Professor of Urban Trees and Landscape Plants and his research and educational efforts focus on tree care practices such as the effect of tree pruning on tree biology, production practices and landscape establishment, root pruning, and irrigation and fertilization practices. He is reason enough alone to attend the conference.

9. BYGLOSOPHY. “The butterfly counts not months but moments, and has time enough.” - Rabindranath Tagore

APPENDIX
ADDITIONAL WEBSITE RESOURCES:

Ask a Master Gardener Volunteer
http://mastergardener.osu.edu/ask

Buckeye Turf
http://buckeyeturf.osu.edu
Emerald Ash Borer Information  
http://ashalert.osu.edu

National Plant Diagnostic Network and First Detector Program  
https://www.npdn.org/first_detector

Growing Degree Days and Phenology for Ohio  
http://www.oardc.ohio-state.edu/gdd/

Hungry Pests Website  
http://www.HungryPests.com

Ohio Pesticide Safety Education Program  
http://usted.osu.edu/

Ohio State University Department of Horticulture and Crop Science Plantfacts  
http://plantfacts.osu.edu/web/

Ohio State University Extension Bee Lab  
beelab.osu.edu

Ohio State University Extension Master Gardener Volunteer Program  
http://mastergardener.osu.edu

Ohio Woodlands Stewards Program  
http://woodlandstewards.osu.edu

The C. Wayne Ellett Plant and Pest Diagnostic Clinic (CWEPPDC)  
http://ppdc.osu.edu/

USDA APHIS Beetle Buster Website (Asian Longhorned Beetle)  
http://www.beetlebusters.info/

USDA APHIS Beetle Detective Website (Asian Longhorned Beetle and Emerald Ash Borer)  
http://beetledetectives.com/

Following are the participants in the July 14th conference call: Amanda Bennett (Miami); Joe Boggs (Hamilton); Julie Crook (Hamilton); Erik Draper (Geauga); Mary Griffith (Greene); Denise Johnson (Master Gardener Volunteer program); Cindy Meyer (Butler); Nancy Taylor (C. Wayne Ellett Plant and Pest Diagnostic Clinic (CWEPPDC)); and Marne Titchenell (School of Environment and Natural Resources).

BYGL is available via email, contact Cheryl Fischnich [fischnich.1@osu.edu] to subscribe. Additional fact sheet information on any of these articles may be found through the OSU FactSheet database [http://plantfacts.osu.edu/web].

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BYGL is available online at: [http://bygl.osu.edu], a website sponsored by the Ohio State University Department of Horticulture and Crop Sciences (HCS) as part of the "Horticulture in Virtual Perspective." The online version of BYGL has images associated with the articles and links to additional information.

Where trade names are used, no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete,
timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: [ go.osu.edu/cfaesdiversity ].

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