BUCKEYE YARD AND GARDEN LINE 2015-09
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Buckeye Yard and Garden Line (BYGL) enhanced with photos and links is available online at: [http://bygl.osu.edu]. Become a fan of the BYGL on Facebook at [http://www.facebook.com/OSUBYGL] or follow the BYGL on Twitter at [http://www.twitter.com/OSUBYGL].

This is the 9th 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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Go to [https://www.giveto.osu.edu/makeagift/OnlineGivingDonation.aspx?fund=315145] and click on "search," then enter the fund number into the box. The fund number is 315145 and the name is Buckeye Yard & Garden Support. The fund, its name and description will appear in a new, smaller box. Click "Select this fund."

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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 - VINCA, ROSE PERIWINKLE (Catharanthus roseus). The secret to success with this plant is that it likes its feet warm so therefore, don't plant in cold soils! This sun-loving, heat-loving annual won't tolerate cold soils and usually ends up with rotted roots if sitting in cold soils for prolonged periods. Ohio gardeners tend to push the envelope and plant this one early in the spring along with other bedding plants. The best time for planting this in central Ohio is generally late May. If it's planted in cold, wet soils, it just sits there. And you wait. And you watch. Then it begins to turn yellow, and the inclination is to fertilize. When it gets to this point, dig one up to check on the roots. Chances are they are either on the way out or dead. WAIT until soil warms up for best success. After that, they'll grow like weeds if the temperatures are hot and dry!

Almost all cultivars of this plant, except for the spreading ones, grow in a mound about 1' tall and as wide. The colorful flowers last all season, hanging on until a hard frost. Flowers come in pink, white, red, salmon, and a combination of these colors (white with red eye, etc.). The glossy green foliage has few pest issues. They can be used in a perennial border, as bedding plants, and in containers. The vining or trailing varieties (Mediterranean and Cora Cascade) are excellent for hanging baskets or hanging over the edge of a container.

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*PERENNIAL - LEAFY BLUE FLAG, ZIG ZAG IRIS (Iris brevicaulis). There are a large number of irises found in Ohio gardens, with bearded, Siberian used most often in gardens. This particular iris is native to Ohio and is found in or near water, swamps and marshes as well as shaded gardens areas. It performs best in moist soils. The plant gets around 1 - 2' tall and grows in clumps. The bluish to purplish flowers (depends on genetics as to the variation in color) are made up of petals and sepals; the sepals are longer than the petals. The zig zag stem gives the plant its common name. In addition, according to the USDA Plants Database, this plant is on the endangered list in Ohio.

I. pseudacorus (yellow flag iris, water flag, or yellow iris) is very similar in flower shape and location for best growth to I. brevicaulis, however, it is not native and was brought in from Europe as a decorative plant. It has now established itself in wet areas in most of North America and is quite prevalent in Ohio. You can find this plant in an area where you might also find cattails. In wet areas it will grow to around 3 - 4' tall with yellow flowers. It will also grow in drier areas but will be a bit shorter. Since it has the capability to remove metals from waste water, it is sometimes used in natural sewage treatment areas.
*WOODY - TRI-COLORED BEECH (Fagus sylvatica 'Tricolor'). Denise Johnson mentioned the beauty of the beech, specifically the eye catching colors of the tri-colored beech in her neighborhood this week in her report. The tree’s stunning leaf colors include shades of pink, purple, green, and white.

The large deciduous tree is upright and has a round to spreading crown with age. Trees will grow to a height of 50 - 60'. Beech trees prefer a site that is moist, but well drained. They are not a fan to extreme heat and high humidity and are intolerant to poorly drained sites. The dense canopy can make it difficult to establish turfgrass under the tree.

While beech can be difficult to transplant and establish, its leaf colors would be a reason to give it a try if your space and soil conditions exist. In addition to the tri-colored varieties, there are also copper-colored, purple and green beech trees. Maybe you will be seeing tri-colored leaves in your landscape.

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*VEGETABLE - SWEET POTATO (Ipomoea batatas). This herbaceous vine, related to the flowering morning glory that graces many gardens, produces large starchy and sweet edible roots. Native to Central and South America, the sweet potato will succeed in areas that can provide a long warm growing season. In Ohio, sweet potatoes are started from "slips", rooted cuttings or sprouts from a growing vine. The slips are grown in southern states or greenhouse grown and shipped north during the proper planting season (late spring). Slips are planted 18" apart in rows 3’ apart. The vines quickly develop to cover the entire area crowding out most weeds. In recent years, sweet potato plants have also been available in local garden centers.

Sweet potatoes can be harvested beginning in late summer and harvest should be completed shortly after frost. Cold soil temperatures reduce the storage life of the sweet potato and rot organisms can quickly move from frosted vines to the roots. Dig carefully to avoid damaging the tuberous roots.

After harvest, the roots must be cured to develop their sweet flavor. After they are dried for a few hours, they are moved into a warm (85F) area with high humidity for two weeks. After this initial curing they can be stored long term in a cool area (55F).

Most varieties available are orange-fleshed ('Centennial', 'Georgia Jet', and the non-trailing 'Vardaman') but white-fleshed varieties might still be found. As a houseplant or school project, a sweet potato will grow an abundance of fine roots, leaves and vines from a tuberous root suspended in water. They can also be stored through spring to grow a crop of slips for next year’s garden.

The term yam is often used interchangeably with sweet potato. Yams (Dioscorea spp.) are native to Africa and Asia and produce very large starchy tubers. They grow only in the tropics. However, because the two names are often thought to indicate the same vegetable, USDA labeling rules require "sweet potato" to be included anytime the word "yam" is used.

Ornamental sweet potatoes (also Ipomoea batatas) are selected for their foliage and growth habit and not for the eating or keeping quality of the roots. Additionally, pesticides used to grow ornamental sweet potatoes may not have been labeled for use on vegetables.

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*WEED - CATCHWEED BEDSTRAW (Galium aparine). Catchweed bedstraw seems to be very prevalent this year. While this annual prefers shade to semi-shade, it can grow under many conditions as long as there is adequate moisture. It is a fast grower and can flower within eight weeks of germination. The cotyledons are oblong to egg-shaped and are generally 1/2 - 1" long and smooth. As the plant grows, it remains low to the ground and will grow into a dense mat of sprawling vegetation. It is
very shallow rooted. The mature plant has stiff square stems with leaves in a whorled arrangement with 6 - 8 leaves per whorl. Tiny hairs are found along the stem and on the leaves, which help the plant attach to people, clothing, and other plants. It flowers from late-May through June. The flowers are small, white or greenish-white, and grow on short stems that form from the leaf axil.

Catchweed bedstraw reproduces by seed. As the seeds begin to form, they grow into two round segments. The mature fruit are brown and covered with small hooks which attach easily to people and animals for dispersal. Each plant typically produces 100 - 400 seeds per year. The seeds can remain viable for up to three years.

While the flowers provide food for some beneficial insects, the plant can also be a host for harmful diseases, pests and nematodes. When present in the landscape or garden, it can compete for nutrients and water, smother small plants, make vegetable harvest difficult and the seeds can be problematic to remove from animal fur.

Hand-removal is an option (be sure to wear gloves). Long-term control is depends on removing the plant prior to seed formation. Simply cutting the plant back without removal of the roots system has not shown to be an effective control. Reports have indicated that when plants are cut, they will grow back and produce 30% more biomass than plants that were not cut. There are several pre-emergent herbicide options available. Post emergent options include oxyfluorfen and glyphosate formulations which can be used in areas where the use of non-selective herbicides is possible. Clove-oil based herbicides are only effective if applied when plants are very small.

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2. HORT SHORTS.

A. IT’S A SPRUCE, NOT A PINE. Like the pine trees, spruce trees are evergreen, coniferous trees and shrubs. Both pine and spruce trees and shrubs are members of the pine family of plants (family Pinaceae). However, pines belong to the genus Pinus and spruces belong to the genus Picea. As described in the article, "What makes a pine, a pine?" (BYGL Issue 2015-08, May 28, 2015), pine trees are characterized by: (a) producing seeds in (female) cones (i.e., pine cones) and (b) having narrow leaves ("needles") arranged in bundles of 2 - 5 with a permanent or deciduous papery wrap or sheath at their bases, called a fascicle. Spruce trees are characterized and distinguished from pine trees by: (a) producing seeds in (female) cones (i.e., spruce cones) and (b) having short (about 1" long or shorter), stiff needles borne singly on the stems extending out from the stem at right angles all around the stem.

Another important distinguishing feature of spruce needles is that they are attached to small, peg-like wooden structures. When the needles are shed, these projections remain and the spruce branches feel rough. Also, spruce needles are sharply pointed, square and easy to roll between your fingers. Even though both pines and spruces are evergreen trees, both do annually shed some of their older needles. Pines tend to drop needles at younger ages than do the spruce trees. For example, white pines will drop their 3 year old needles each fall only retaining their current year and 2-year old needles through the winter. White pine needle drop can be alarming because the yellowing of the needles before they drop can be dramatic and obvious. Other pines hold their needles for 3 - 4 years. Spruces, on the hand hold their needles for several years and their needle drop is much less obvious.

Like the pines, spruces are monoecious (i.e., individual trees have both female cones which bear the ovules which when fertilized develop into seeds and male cones which shed the pollen). The female cones are the most obvious because of their size and length of time that they are on the trees. The male cones are generally much smaller than the female cones and are present on the trees for a short period of time. Once the male cones shed their pollen, they often break apart and fall from the tree. The pollen is carried by wind and gravity; none of the spruces is pollinated by insects or birds.
One can use cone characteristics to distinguish between pines and spruces as well. Cones are made up of scales (modified needles) attached to a center stalk. Female cones of both pines and spruces start their development pointing upwards, but eventually droop downwards as they mature. Pine cone scales are woody while spruce cone scales are thinner and more flexible. Also, both pine and spruce cones typically fall whole from the tree relatively intact.

Both pine trees and spruce trees and shrubs are used in landscapes. Both tend to be relatively shade intolerant, but grow well in open, sunny areas. Neither tolerates heavy, wet soils very well. Three commonly used spruce species in Ohio include COLORADO (BLUE) SPRUCE (P. pungens), NORWAY SPRUCE (P. abies) and WHITE SPRUCE (P. glauca).

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B. MULCH MADNESS OR THE "MIS-MULCHING OF AMERICA". Mulch is a great way to suppress weeds, conserve moisture, and add appeal in a landscape. However, sometimes mulching can go awry and create unexpected challenges to gardeners and professionals alike. One such challenge is the overzealous application of mulch. Perhaps in an effort to squash all the weeds below, mulchers sometimes pile mulch too high around the base of trees and other plants. While some may find this appealing, it actually creates serious issues for the plant. Affectionately known as volcano mulch, these mounds of mulch hold moisture against the base of tree trunks and plant crowns that can lead to decay or disease. These mulch-canons can also result in new root formation from the trunk of the tree or a girdling root condition that will strangle the tree. To prevent such issues, proper mulch depth should be 1 - 3" deep. This will provide adequate moisture retention, weed suppression, and aesthetics without damaging your landscape plants.

An additional challenge mulch users may face is sour mulch. We all recognize the smell. The pungent, vinegary, rotten smell often signals that new mulch is nearby. This odor may be a sign that the mulch piles were improperly stored or that they were not turned frequently enough during production. Without turning, anaerobic conditions form where bacteria can produce toxic byproducts such as methanol, ammonia, or hydrogen sulfide gas. Those sour smells are signs that these substances are present, which can spell trouble for your newly planted trees and herbaceous plants! These byproducts are highly acidic and can actually "burn" plants. Damage may include yellowing leaves, scorched edges, defoliation, or death. In the event you do receive sour mulch, there is a solution. Odorous mulch can be spread into a thin layer on a tarp to "air out" before use. Spraying down the mulch and allowing it to dry on the tarp can also help. This allows the noxious gas to dissipate and the mulch to cure. Mulch can then be used as normal.

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C. THE GALL TRILOGY: PART II. Part II of the so-called "Gall Trilogy" written by Joe Boggs and Jim Chatfield for American Nurseryman Magazine is now available online. The article is titled, "Plant Galls: Myths and Misconceptions" and includes the "Six Gall Laws." The final installment of the Gall Trilogy will appear in the July issue. Here's the web link to the current issue of the magazine: [http://www.amerinursery-digital.com/#&pageSet=12].

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3. BUGBYTES.

A. IMPORTED WILLOW LEAF BEETLE. Joe Boggs reported observing first generation willow leaf beetle (Plagiodera versicolora) adults munching the leaves of wild and cultivated willows in southwest Ohio. This native of northern Europe was first found in the U.S. in 1915. Since that time, it has become well established throughout most of the eastern and Midwestern states. Although it has been a number
of years since a significant outbreak has been reported in Ohio, this beetle has a history of periodically achieving population outbreak densities and causing significant defoliation of its namesake host.

The oblong adults measure around 1/8″ in length and may sport a bluish-black or bluish-green hue depending upon the angle of the light reflecting off these shiny beetles. They feed by chewing holes or notches in willow leaves. Adults spend the winter under loose bark or beneath leaf litter at the base of trees. They emerge in the spring to mate and lay eggs. The resulting tapered bluish-black larvae skeletonize leaves and typically cause more damage than the adults. Young larvae may feed side by side and move as a group across the upper or lower leaf surfaces. Heavy infestations cause leaves to turn brown and appear scorched.

Damage caused by the beetle can become significant since two or three generations may occur in Ohio. Standard insecticides labeled for willow are effective in managing this pest, as well as insecticidal soap sprays if applied to the larvae.

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B. YELLOW POPLAR WEEVIL. Tom Macy (Forest Health Program & Special Projects Administrator, Ohio Department of Natural Resources, Division of Forestry) notified BYGLers that he is observing and receiving reports of significant adult leaf-feeding damage that has been caused by the overwintered "spring generation" of the yellow poplar weevil (Odontopus calceatus) in southcentral and southeastern Ohio. Likewise, Ashley Kulhanek noted that she is also seeing noticeable damage in the northeast part of the state.

Populations of this native snout beetle are extremely cyclic with 2 - 3 consecutive years of "outbreak" population densities usually followed by several years with almost no weevils observed. Localized outbreaks were observed in 2013 in central and northeast Ohio (BYGL 2013-07 (05/16/13); 2013-14 (07/05/14)) and last year in the southern, central, and northeast parts of the state (BYGL 2014 (06/12/14); 2014-14 (07/03/14)). It would appear that parts of southern and northeast Ohio are experiencing a repeat performance this season!

Yellow poplar weevil adults feed on leaves and the larvae feed within leaves as leafminers. Adults and larvae may be found on three hosts: yellow poplar (a.k.a. tuliptree or tulip polar); magnolia; and sassafras. Thus, alternate common names include "sassafras weevil" or "magnolia leafminer."

The small (2/16″ long), oval-shaped weevils (order Coleoptera; family Curculionidae) range in color from black to brownish-black to reddish-brown and have deeply grooved wing covers (elytra). Although they are good flyers, the weevils often elect to fold their legs, drop to the ground, and "play dead" when disturbed; a defense strategy that is common among weevils. In the eyes of some people, yellow poplar weevils resemble ticks which may generate calls to Extension offices concerning "flying ticks" during outbreak years. Of course, ticks can't fly.

Yellow poplar weevils have one generation per year; however, adults feed twice during the growing season. Adult feeding damage appears as characteristic half-moon-shaped holes in the foliage. Numerous feeding holes can cause leaves to wilt, turn brown, and die. Adults spend the winter in protected sites such as the duff beneath trees. They emerge in the spring to feed, mate, and lay eggs in leaf midribs. This is the so-called "spring generation" of adults. Their larval offspring feed as leafminers either singly or in groups to produce large blotch mines. Although larval leafmines are noticeable, the most serious damage is caused by the adults.

Newly emerged adults feed throughout mid-summer and typically cause the most significant damage owing to their larger numbers. This is the so-called "summer generation" of adults. Eventually, the new adults will cease feeding, move from their host trees and seek overwintering sites. Although the damage caused by the summer weevils may be noticeable, it is seldom severe enough to damage the overall health of affected trees. However, small, newly planted trees may be harmed. Thus, these trees should
be closely monitored when the summer adults begin to arrive on the scene. Most topical insecticides labeled for the targeted site and host tree will suppress these weevils.

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

* Joe Boggs reported that the tannish-brown COTTONY MAPLE LEAF SCALE (*Pulvinaria acericola*) females are exuding their conspicuous, elongated, white, cottony ovisacs in southwest Ohio. This cottony scale may be found on the underside of the leaves or on the stems of their namesake host as well as on Andromeda, dogwoods, hollies, honeysuckle, sassafras, sourgum, and willow. The scale seldom causes enough damage to landscape trees to warrant control; however, populations can build rapidly since the ovisacs may contain over 2,500 eggs. The scale is also a copious producer of honeydew and the sweet, sticky material may become colonized by black sooty molds creating an unsightly mess.

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* Joe Boggs also reported observing the handiwork of MEADOW SPITTLEBUG (*Philaenus spumarius*) producing its tell-tale frothy, spittle-like masses on a variety of herbaceous plants and DOGWOOD SPITTLEBUG (*Clastoptera proteus*) doing the same on its namesake host in the southwest Ohio. The frothy masses are produced by spittlebug nymphs (family Cercopidae); adults of these insects are called "froghoppers." The nymphs are found embedded with the frothy mass with the foamy "spittle" serving several functions including protecting them from predators and parasitoids. Most types of spittlebugs cause little harm to their hosts and are primarily viewed as oddities. Dogwood spittlebug is a good example. While they may feed on all species of dogwoods in Ohio’s woods and landscapes, their "damage" is mostly relegated to the unattractive appearance of the spittle-masse as well as the unsightly occurrence of blackened foliage produced by sooty molds colonizing spittle that drips onto leaves.

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* All bagworms are not created equal. On the BYGL call this week, Joe Boggs shared that GRASS BAGWORM (*Psyche casta*) are on the move. Unlike its later-emerging cousin the COMMON BAGWORM (*Thyridopteryx ephemeraeformis*), grass bagworm does not pose a defoliation risk to our deciduous trees and conifers. These smaller, earlier caterpillars feed primarily on grasses and other low-growing foliage. Grass bagworms are often confused as early instars of the former. However, they can be differentiated not only by their earlier appearance in the year, but also by their distinctive cases, which are made of leaf blades and twigs. These are laid in rows along its body giving it a spiky appearance much different from the needle- or leaf-laden cases of the larger common bagworm.

Grass bagworms climb onto vertical surfaces to pupate such as trees, fences, or exterior walls. Here is where they are typically found and alarm homeowners. Never fear, as these grass feeders are unlikely to cause damage to tree foliage and do not warrant control measures.

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4. DISEASE DIGEST.

A. FIREBLIGHT IGNITES PERPLEXITY. Curtis Young in Ada, Ohio and Joe Boggs in Hamilton County, OH reported that SOME ornamental Callery pears are showing branch flagging due to fireblight, (*Erwinia amylovora*). Of course this report lit up the debate as to whether these strikes were merely a local artifact or a preview of the wildfire yet to come. Both Joe and Curtis observed crabapples and other Callery pears next to the highly affected ones, with no symptoms whatsoever! Pam Bennett in Clark County, Ohio and Erik Draper, NE Ohio both indicated that as of yet, there were no indications of this
bacterial disease in their areas. We shall see what happens regarding the impact of fireblight, throughout Ohio, in the coming weeks.

Remember that fireblight can infect a tree by both blossoms and new, succulent, vegetative shoot tissues. The tiny bacterium can enter into the new shoots via wounding caused by hail, insects, branches rubbing together in the winds, pruning, and even the lenticles. Once inside the branch tissue, the bacteria replicate and produce a polysaccaride, which serves to plug up the xylem of infected shoots and twigs. This results in the characteristic wilting, rapid death and blighting of infected shoots from the loss of turgor pressure in the cells; consequently, the characteristic collapse, blackening and "crooking" of the young branch, quickly becomes evident. Symptoms usually appear 1 - 3 weeks after inoculation, depending on temperature and humidity.

For fascinated plant diagnostoids, bear in mind that fireblight only occurs on plants in the Rosaceae family. Unfortunately, that plant family that is the single largest contributor to the horticulture and the landscape industry. This bacterial disease of certain plants in the rose family, such as apple and crabapple, ornamental pear, pyracantha, mountainash, and cotoneaster, all have varying degrees of susceptibility to this disease. Epiphytotic events of fireblight are favored by warm (60 - 90F), humid (relative humidity >60%), wet weather during bloom of the affected host plants. While fireblight is impossible to control, the best management approach is to use genetic resistance to combat this disease. Carefully research multiple reports or studies of fireblight challenged plants and from these lists, make the proper cultivar selections first...before those landscape plantings go up in flames!

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5. TURF TIPS.

A. FUNGUS CAUSING TURFPHILES TO SEE RED! Cindy Meyer in Clermont County, Ohio, mentioned to BYGLers that RED THREAD (Laetisaria fuciformis) has begun its assault on lawns. Cindy had been wondering what could cause a lawn to begin to go brown in spots, which of course, it couldn't be anything other than the feuding neighbor! Cindy couldn't take the suspense any longer and went out to do some diagnostic sleuthing. Lo and behold, upon close examination of the "killed spots", she was shocked to see the tiny, red threads sticking out of the turfgrass blades. So why suddenly does this fungal disease seem to appear out of nowhere? The first question to ask is if anyone has noticed a change in the color of the lawn. Everyone quickly agrees that they had noticed most lawns turning an off-color. With the excellent temperatures and plentiful moisture favoring turfgrasses, the rapid growth resulted in the "mow, mow, mow your lawn" syndrome; accordingly, the turf has exhausted most of the supply of nitrogen that previously existed in the soil. For this disease, its emergence is typical in spring and early summer, just about the time that the benefits of the fall-applied nitrogen fertilizer are exhausted!

Red thread is most commonly found on Kentucky bluegrass, perennial ryegrass, and tall fescue. Outbreaks ordinarily occur in minimally maintained stands of turfgrass, like residential lawns. Red thread development is most common where overall turfgrass and soil nutrition is poor and other environmental factors exist to slow turf growth.

The preferred method to manage red thread is to first do a soil test to confirm or correct any soil factors, like pH, and adjust any nutrient deficiencies other than nitrogen. Once those factors have been amended, the next step to manage the red thread fungus is to apply about 0.25-0.5 pounds of nitrogen per 1000 square feet, to the turf to help it "outgrow" the infected tissue. It is always recommended that when applying nitrogen fertilizers to turfgrass, ensure that at least one-third of the amount of nitrogen is in a slow release form, often termed "water insoluble nitrogen". This will allow the nitrogen to be released over a longer period of time, rather than all at once, which should help the turf combat that aspect of poor nutrition!
6. INDUSTRY INSIGHTS.

A. THE VERY HUNGRY CATEPILLAR - GYPSY MOTH UPDATE. The gypsy moth (*Lymantria dispar*) is continuing its feeding frenzy. While the Ohio Department of Agriculture’s (ODA) larvicide applications have been applied this spring to the pre-identified treatment blocks, the next step in their management activities will be turning to the aerial application of the mating disruption. Those treatments will likely begin in a couple weeks and are made prior to the adult emergence in already identified areas. The goal of the mating disruption is to do just that - disrupt the mating cycle of the adult gypsy moths in areas where population numbers are relatively low but appear to be building based on trap results. The mating disruption is not an effective management tool in areas where population levels are high and damage from the caterpillars severe.

Fifty-one of Ohio’s 88 counties are currently quarantined as a result of these very hungry caterpillars. A link to the quarantine map can be found at [http://www.ohioagriculture.gov/divs/plant/gypsy/maps/GypsyMothQuarantineCounties.pdf](http://www.ohioagriculture.gov/divs/plant/gypsy/maps/GypsyMothQuarantineCounties.pdf). Fifteen counties including Allen, Athens, Auglaize, Clermont, Delaware, Fairfield, Franklin, Hocking, Jackson, Marion, Mercer, Perry, Putnam, Vinton and Wyandot will have mating disruption treatments applied later this month. Information, including county specific maps, can be found on the ODA website.

If you have noticed gypsy moth caterpillars this spring, reports can be made through the Great Lake Early Detection Network (GLEDN) App, or by emailing Amy Stone at [stone.91@osu.edu](mailto:stone.91@osu.edu).

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B. OBSCURE SCALE. Joe Boggs reported observing a heavy infestation of obscure scale (*Melanaspis obscura*) on a 10” DBH pin oak in a landscape in southwest Ohio. This is a type of "armored scale," (= hard scale), so-named because this group of scales cover themselves in a hard, waxy shield that provides some protection against predators and parasitoids. Their shield also prevents topical insecticides from coming into contact with the scale. The flattened, disc-shaped mature females are about 2/16” in diameter. Their small size coupled with their mottled silvery-gray coloration which allows them to blend with the bark can make this scale difficult to detect until damaging populations develop, thus the "obscure" in the common name.

Obscure scale has a wide host range including beech, dogwood, hickory, maple, oak, and willow. However, it is most often found on oak and is considered a key pest species of pin oaks. As with all armored scales, obscure scale uses its piercing-sucking mouthparts to extract sap from its host tree. The scale seldom kills established trees; however, heavy feeding damage can weaken trees producing canopy dieback and making heavily infested trees susceptible to other pest and disease problems.

Early detection of obscure scale is essential to preventing the development of damaging populations. Small twigs should be closely examined since this scale often launches its assault from this location. Lightly infested twigs should be removed and destroying to prevent movement onto branches.

Heavy infestations are notoriously difficult to suppress for three reasons. First, the efficacy of systemic neonicotinoid insecticides against this scale appears to be inconsistent requiring the use of topically applied insecticides. Second, the hard waxy covers protects the females which means 1st instar nymphs (crawlers) are the most susceptible stage; however, the crawlers commonly settle beneath the overlapping bodies of females placing them out of the reach of contact insecticides. Finally, eggs are laid and hatch over an extended period time, from early-June into early-September, meaning that multiple topical applications must be made.
Unfortunately, insecticides targeting the crawlers may also kill predators and parasitoids that have been shown to be important for naturally suppressing obscure scale populations. Reports in the literature indicate that the impact on bio-allies may be minimized by confining most of the applications to mid-August when crawler numbers peak and the bio-enemies of this scale are least active.

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C. THE HORNED OAK GALL MANAGEMENT CHALLENGE. The vast majority of the insect and mite galls found on oaks cause little to no harm to the overall health of their host trees. However, the gnarled, woody stem galls that form on the twigs of pin oak under the direction of the gall-wasp, *Callirhytis cornigera* (Family Cynipidae), are an exception. The galls may completely encircle twigs and incorporate all of the vascular tissue within the gall structure which disrupts vascular flow to and from the portion of the twig beyond the gall. However, management of this gall-maker is challenging for several reasons; not the least of which is its complex life cycle.

Alternate generations of the wasp propagate by sexual and asexual reproduction, a condition called heterogamy. The alternating generations produce two entirely different types of galls on different parts of the tree. The sexual generation of wasps (males and females are produced) develops from small, bean-shaped, light green to yellowish-green leaf galls that are found on the underside of leaves sprouting from the sides of the leaf veins. The galls are very difficult to detect and given their insignificant appearance, it's hard to imagine that these diminutive growths are responsible for spawning the wasp generation that is responsible for the highly conspicuous stem galls. Leaf gall growth starts in the spring and wasp development within the galls, from eggs to adults, takes about three months. Once the males and females emerge from these galls and mate, the females fly to twigs and small branches to start the next generation of wasps; the asexual generation that directs the growth of the stem galls.

The egg laying activity of the females that developed in the leaf galls stimulates the growth of stem galls from cambial stem tissue. The sizes of the galls depend on the number of eggs laid; larger galls hold more eggs and resulting wasp larvae. The larvae spend 33 months in individual chambers within these very obvious gnarled, dark green, woody stem galls. The galls grow larger in size with each season. In early spring, as the immature wasps near the completion of their development, the whitish-tan, cone-shaped "horns" that give this gall its common name begin to extend from the gall. Adult wasps emerge from the horns once they are fully extended. This is the "asexual" generation; all of the adults are females, there are no males in this generation. This form of asexual reproduction, where females do not require fertilization by males to produce fertile eggs, is called "parthenogenesis." The females that emerge from the stem galls are feeble flyers, so the mostly crawl to a nearby leaf bud to lay eggs initiating the next generation wasps that develop in the leaf galls.

Management strategies for the horned oak gall wasp must take into account the two locations where the gall-maker resides. Adding to the complexity is that nothing is synchronized. Leaf galls occur every year providing a constant stream of wasps producing new stem galls. The annual reservoir of wasps streaming from the leaf galls that are dedicated to producing stem galls, would make trying to manage the horned oak gall by pruning out galled stems a never-ending process.

In the late 1990’s, researchers at the University of Kentucky targeted horned oak gall-wasps for one of the most complete insecticide efficacy trials conducted against any insect gall-maker. The researchers reasoned that the leaf-galling generation may be the "weak link" in the wasp's life cycle relative to insecticide suppression owing to the annual initiation of new galls and the location of the wasp larvae in small, vulnerable leaf galls. The researchers made foliar applications of contact insecticides targeting females as they laid eggs. Wasp larvae inside leaf galls were targeted with foliar applications of translaminar systemic insecticides and trunk injections of concentrated solutions of systemic insecticides.

Their results revealed an insecticide conundrum related to an unintended consequence that is probably not unique to controlling any insect gall-makers. All of the application methods and most of the insecticides used in the trial provided a significant suppression of the horned oak gall-maker. However,
the insecticide treatments also had a severe impact on beneficial parasitoids which accounted for about a 70% mortality rate of the leaf-galling generation in the untreated "control" trees. In other words, while insecticides were proven to be effective, the unintended consequence was to kill the very beneficial insects that could account for a natural reduction of the gall-maker almost equal to the insecticides!

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**D. VIBURNUM LEAF BEETLE MOVING WEST.** Curtis Young reported a new find of viburnum leaf beetle (*Pyrhula viburni*) was discovered in Hancock County in the city of Findlay, Ohio. OSU Master Gardener Volunteer Bill Jones of the Hancock County Master Gardener Program was called to a home in Findlay where 3 arrowwood viburnums (*Viburnum dentatum*) were showing varying levels of defoliation, one of which was completely defoliated. Initially, Bill was not able to find larvae or adults of VLB on the shrubs. Bill contacted Curtis to assist in the identification and verification of the presence of VLB.

A second visit to the site led to the discovery of a multitude of VLB larvae buried in the soil beneath the completely defoliated host plant. This is normal behavior in VLB's life cycle. VLB overwinters in the egg stage in pits on the branches of the host plant. VLB larvae hatch in the spring to feed on the foliage. Mature VLB larvae abandon the foliage and migrate to the soil where they burrow into the soil to pupate (this is the stage in which they are currently). After a couple of weeks, new adult VLB will emerge from the soil to return to the foliage to eat again. Adults will eat on the foliage, find mates, mate and lay eggs for the next generation. These eggs will not hatch until the following spring.

Until this find was discovered, the furthest west VLB had spread in Ohio was Richland County, Mansfield, Ohio.

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**7. WEATHERWATCH.**

**A. WEATHERWATCH.** The following weather information summarizes data collected at various Ohio Agricultural Research Development Center (OARDC) Weather Stations spanning the dates from May 1 - 31, 2015, with the exception of the soil temperatures which are readings from Wednesday, June 3, 2015 at 11:20 p.m.

The big news on this week's conference call was this past weekend's weather change. BYGLers reported that Saturday's (05/30/2015) weather was warm across the buckeye state. Temperatures dropped and rain fell on Sunday (05/31/2015). While each caller mentioned receiving rain, the "northerners" of the group precipitation amounts ranged from 2 - 4"+. Curtis Young and Amy Stone described flooded fields and full ditches.

As the rain moved in, temperatures did fall. Evening temperatures dipped into the 40Fs and 50Fs. Cooler temperatures continued into the beginning of the work week.

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<tr>
<td>Ashtabula</td>
<td>NE</td>
<td>79.5</td>
<td>52.9</td>
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<td>4.5&quot;</td>
<td>75.14/74.13</td>
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<td>52.0</td>
<td>4.33&quot;</td>
<td>3.9&quot;</td>
<td>70.06/68.08</td>
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<tr>
<td>Hoytville</td>
<td>NW</td>
<td>76.8</td>
<td>53.6</td>
<td>4.18&quot;</td>
<td>3.4&quot;</td>
<td>73.69/68.24</td>
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<tr>
<td>Columbus</td>
<td>Central</td>
<td>79.4</td>
<td>56.4</td>
<td>3.37&quot;</td>
<td>4.4&quot;</td>
<td>67.43/66.33</td>
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<tr>
<td>Piketon</td>
<td>South</td>
<td>79.5</td>
<td>52.9</td>
<td>1.88&quot;</td>
<td>4.5&quot;</td>
<td>71.96/69.55</td>
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For a link to the OARDC Weather Stations, visit: [http://www.oardc.ohio-state.edu/centernet/weather.htm](http://www.oardc.ohio-state.edu/centernet/weather.htm)
B. GROWING DEGREE DAYS. GDD is a measure of the daily maximum and minimum temperature and directly relates to growth and development of plants and insects. The GDD of any zip code location in Ohio is estimated using the GDD of ten OARDC weather stations and available on the web at: [http://www.oardc.ohio-state.edu/gdd/].

The range of GDD accumulations in Ohio from north to south is 549 to 808. Following is a report of GDD for several locations around Ohio as of end of the day of June 3, 2015: Painesville, 549; Cleveland, 585; Toledo, 621; Canfield, 597; Findlay, 625; Van Wert, 637; Wooster, 623; Coshocton, 713; Columbus, 807; Springfield, 743; Dayton, 747; Cincinnati, 788; Ironton, 807; Portsmouth, 808; and Piketon, 792.

To put these GDD accumulations into perspective, the following is an abbreviated listing of plant and insect species with their respective phenological event and average GDD accumulations at which these events occur. Due to variations in weather, temperature, humidity, etc., these events may occur a few days earlier or later than predicted by the average GDD. By looking at a city, town, or village nearby on the above list, or visiting the above web site, one can see what is approximately taking place in the landscape.

Arrowwood viburnum, first bloom, 534; American yellowwood, first bloom, 546; bronze birch borer, adult emergence, 547; black locust, full bloom, 548; American holly, first bloom, 556; mountain laurel, first bloom, 565; potato leafhopper, adult arrival, 568; juniper scale, egg hatch, 571; common ninebark, full bloom, 596; American yellowwood, full bloom, 599; arrowwood viburnum, full bloom, 621; multiflora rose, full bloom, 643; northern catalpa, first bloom, 675; black vine weevil, first leaf notching due to adult feeding, 677; Washington hawthorn, full bloom, 731; calico scale, egg hatch, 748; greater peach tree borer, adult emergence, 775; rhododendron borer, adult emergence, 815; northern catalpa, full bloom, 816; mountain laurel, full bloom, 822; dogwood borer, adult emergence, 830; and oakleaf hydrangea, first bloom, 835.

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8. COMING ATTRACTIONS.

A. SOUTHWEST OHIO BYGLIVE! DIAGNOSTIC WALK-ABOUT. The third 2015 Southwest Ohio BYGLive! Diagnostic Walk-About will be held on Monday, June 8, 2015 at the Stanley M. Rowe Arboretum, 4600 Muchmore Rd., Indian Hill, 45243. We will start at 12:00 p.m. and walk-about with our host Chris Daeger looking at plants, plant pests, diseases, and other points of considerable interest until 3:00 p.m.

This monthly hands-on training series for Green Industry professionals provides the following training credits: ISA Certified Arborist CEU’s; ONLA OCNT credits, and Landscape Architecture Continuing Education System (LA CES) CEU's for Landscape Architects. For more information and to register, visit [http://go.osu.edu/zs7]. You can also e-mail Joe Boggs [boggs.47@osu.edu] to learn more about this diagnostic training series.

B. A GARDENER’S GUIDE TO CLIMATE CHANGE. The Greene County Master Gardeners present "A Gardener's Guide to Climate Change." The workshop will focus on sustainable solutions to environmental challenges, featuring Ohio State University Professors Dan Herms and Jim Chatfield. Topics include: Earth is Warming - Are We the Cause?; What Science Tells Us About Climate Change?; Biological Calendars: Using Plant Phenology; Sustainable Gardening in a Changing Climate; and Ten Keys to Taking Action in Your Backyard. The event is June 13, 2015 at the Greene County Fairgrounds, 100 Fairground Rd, Xenia, OH. Registration begins at 8:30 a.m., with the program running from 9:00 a.m. - 3:30 p.m. For more information, including registration form, visit [http://greene.osu.edu/events/gardener%E2%80%99s-guide-climate-change-0].
C. 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 whole of nature is a conjugation of the verb to eat, in the active and the passive.” - William Ralph Inge

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://pested.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
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 June 2nd conference call: Pam Bennett (Clark); Joe Boggs (Hamilton); Julie Crook (Hamilton); Erik Draper (Geauga), Denise Johnson (Master Gardener Volunteer program); Jacqueline Kowalski (Cuyahoga); Ashley Kulhanek (Summit); Amy Stone (Lucas); and Curtis E. Young (Van Wert).

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: [http://go.osu.edu/cfaesdiversity].