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This is the 12th 2013 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.

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1. PLANTS OF THE WEEK.

*ANNUAL - LANTANA (*Lantana* spp.) Lantana is a native of tropical Americas and West Africa. In the northern states including Ohio, it is grown as an 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.
Lantanas are generally low maintenance, growing vigorously in full sun. Once established, they are quite drought tolerant. A light fertilization in spring will usually be sufficient for the season. 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.

*PERENNIAL - DAYLILIES (Xanthorrhoeaceae Family). Daylilies (*Hemerocallis* spp.) are in bloom. With more than 50,000 registered daylilies a variable rainbow of flowers will be visible through autumn. Daylilies come in a wide array of color, heights, shapes and bloom sizes. They can range from 12" in height to 5' with flower sizes varying from under 3" to over 4.5". This hardy herbaceous perennial is not a lily and not a bulb. Daylilies have a fibrous root system that is easy to grow, quick to multiply and adaptive to well-drained soil conditions. They thrive in full sun to part shade.

Gardeners can add color to their landscape by using daylilies as a border, in mass plantings or as a ground cover. Even with flowers lasting only one day as described by their Greek name, *hemer* for day and *kallos* for beauty, with multiple flowers per plant blooming is spread over weeks. If you are looking for a hardy plant check out *Hemerocallis* 'Stella d'ora'. This compact miniature plant has multiple yellow blooms and can be seen in many yards and public plantings. Another popular daylily is a repeat-blooming hybrid *Hemerocallis* 'Happy Returns' which has fragrant lemon yellow, ruffled flowers. To encourage prolific blooming from year to year, daylilies should be divided every 3 - 4 years.

*WOODY - LITTLELEAF LINDEN (*Tilia cordata*). Littleleaf linden is a medium-sized tree native to Europe, with a strikingly dense pyramidal (young trees) to rounded (mature trees) crown. A healthy, mature specimen growing in an open area will have a crown height of 30 - 45' and a width of 20 - 30'. Littleleaf linden grows well on deep, fertile, well-drained loam and clay soils and tolerates wide soil pH range of 5.5 to 7.5. The tree can moderately tolerate flooding, but does not handle drought very well. Littleleaf linden may develop leaf scorch under drought conditions. The tree grows best in full sun, but will tolerate some shade. It can be a desirable specimen tree in the landscape, but it is highly attractive to many insects, especially Japanese beetles. In years when Japanese beetle populations are high in an area, littleleaf lindens of any size can be totally defoliated by the beetles. The Japanese beetles won't kill the trees but they sure do render them ugly by the end of the summer.

The flowers of littleleaf linden are highly fragrant and attractive to bees and many other nectar and pollen feeding insects. Even the most oblivious persons can smell the sweet perfume of this tree from many feet away. The heavy fragrance of the linden blooms are a source of "yuck" for some, while others lavish in the sweet scents. Honey derived from littleleaf linden is highly desirable for its flavor.

*VEGETABLE - TOMATO (*Solanum lycopersicum*). The tomato is probably the most widely grown vegetable by the home gardener because it is usually easy to grow and a few plants provide an abundant harvest for most families. Tomatoes are a warm-season crop that should be planted only after danger of frost has passed. Tomatoes are particularly sensitive to low night temperatures and extremely high temperatures. Blossom drop can occur in early spring when daytime temperatures are warm, but night temperatures fall below 55F. This phenomenon will also occur during the summer when daytime temperatures are above 90F and night temperatures are above 75F.

There are hundreds of varieties of tomatoes that are available for home gardeners. They range widely in size, shape, color, plant type, disease resistance and maturity. Tomato plants fall into one of two types that affect ultimate plant height and cultural requirements. Determinate tomato plants grow to a certain height and then stop. They also flower and set all their fruits within a relatively short period of time. Indeterminate tomato plants grow, flower, and set fruit over the entire growing season. Some of the indeterminate cultivars can easily grow to 8' tall.
Tomatoes can be grown in many different soil types, but a deep, loamy, well-drained soil supplied with organic matter and nutrients is most suitable. If you have heavy clay soil in your garden, one option is to add organic matter, such as peat moss or compost, to improve soil structure and drainage. Tomato plants require full sun, at least 6 - 8 hours of direct sunlight per day. Starting seeds indoors early or buying transplants gets tomatoes off to a good start in the garden when warm weather arrives and it will save several weeks in growing time. Proper spacing and plant support are essential for plant health and good fruit production.

Tomatoes are heavy feeders and respond well to fertilizer applications. Having your soil tested is the best way to know exactly how much and what type of fertilizers you need to apply. Either too little or too much fertilizer is not good for tomato plants. Applying a starter fertilizer when transplanting will help tomato plants grow faster and flower sooner. Tomato plants need about 1-1.5" of water per week. Water plants in the morning for the best success. An even moisture supply is important, especially once tomato fruits begin to develop. Once the tomato plants are established, apply an organic mulch (weed free straw or bark chips) to conserve moisture and suppress weed growth.

*WEED - CHICORY (Cichorium intybus). Chicory, otherwise known as blue daisy, blue dandelion, common chicory, succory, or wild bachelor's buttons, is a common sight out on Ohio's roads and highways. This plant, which was originally found in the Mediterranean, is a perennial that grows a rosette of irregularly-toothed basal leaves. The plant then produces leafless stems that emerge with beautiful sky-blue flowers that look similar to daisies. The blue flowers are found in clusters of one to three at the top of the stems. This plant is widely distributed throughout the US.

2. HORT SHORTS.

A. SUBMITTING SUSPECTED SAMPLES OF POTENTIAL INVASIVE SPECIES. While we encourage everyone to be on the look-out for all invasive species, that is only the first step. When someone suspects that they are seeing an invasive species, one already identified and on the watch list, or a new arrival, there are some important things to remember. These items are often species specific. We will be tackling the protocol for several invasive species in upcoming issues of the Buckeye Yard and Garden Line.

Not matter the species, it is important to wait for the final determination before saying too much. Sometimes what is thought to be an invasive species, turns out to be an encounter with a native or already known to be established species. This is how rumors can get stated. Soon everyone is hearing about a "so-called" new infestation, that really may not even exist.

BYGLers will be tackling the emerald ash borer (EAB), Asian longhorned beetle (ALB), hemlock wholly adelgid (HWA), thousand canker disease of walnut (TCD), gypsy moth, giant hogweed and viburnum leaf beetle (VLB). Stay tuned to learn about how you can get involved battling each species through early detection.

B. MID-SUMMER LEAF DROP. Tree owners and those responsible for maintaining trees often observe leaf drop occurring in mid-summer. Sometimes the number of leaves falling appears excessive, but in reality, the number of leaves lost is small in comparison the overall number of leaves in the tree. Some suggestions for the cause or causes of mid-summer leaf drop include:

*Drought: Trees may lose as many as 10% of their leaves during a drought without being irreversibly affected. Typically, once drought conditions are in place, leaves begin to drop and continue to drop for the extent of the drought period. While a tree uses leaves to make food, this amount of leaf loss does little
or no harm, and may actually be helpful to the tree. By shedding these leaves the tree loses less water through transpiration.

*Adjustment to summer conditions: Sometimes trees just make too many leaves! When cool moist spring weather turns to hotter, dryer summer conditions a number of leaves may drop suddenly. In Ohio, this may happen sometime in mid-June to mid-July. This is called "physiological leaf drop" and does not harm the plant's health.

*Inner leaf drop: The observer should look carefully at the tree. If the falling leaves are from the inside of the tree they may have been "shaded out". Inner leaf drop occurs when the leaves on the outside and top of the tree are so thick that the leaves inside the tree do not receive enough sunlight. After such leaf drop, the larger branches inside the tree and close to the trunk look bare. Inner leaf drop is normal and not harmful.

*Shading: If leaves can be lost due to shading from within a single tree, then it follows that leaves can be lost when an entire tree is shaded. Trees are living things and a tree may grow so large that it begins to cast shade on another tree which was once in sunlight. The smaller tree no longer receives enough light to support its leaves which begin to drop. Another form of shading occurs when closely planted trees grow so large that they begin to shade each other on the sides that face each other. Often, this leads to leaf loss on the sides of the trees where they are in close contact or are intermingling branches.

*Insect damage: Leaves may fall when they have been damaged by insects. Most types of trees can be affected by one type of insect or another, few insects affect many types of trees. In Ohio, a common example of an insect which causes leaves to drop is the maple petiole borer which appears most years in May and June. Although leaf drop from an affected maple may seem dramatic, the leaf loss lasts only a week or so and then is over for the year and the number of leaves lost is not significant to the tree. On oak, there are various leaf mining insects that cause small amounts of damage. Aphids that attack tree leaves during the summer can also cause early yellowing and leaf drop. This is most common on tuliptrees, oaks, birches and some maple species.

*Sooty molds: Some insects excrete honeydew, a sugary substance in which various molds (some of them quite dark) may grow; these are known as sooty molds. In Ohio, these insects are usually aphids or scale insects, but leafhoppers, planthoppers and spittlebugs are also common culprits. If the honeydew excretions and the sooty mold coating are heavy, leaves may drop because light cannot penetrate the coating of mold to reach the leaves. In essence, a coating of sooty mold is another form of shading. The sooty mold does no direct harm to the tree, but the observer may want to determine the source of the honeydew. The insect excreting the honeydew may be so plentiful that damage is also occurring from the feeding activity of the insect.

*Leaf diseases: Leaves may fall after they've been infected by various leaf spot diseases. In Ohio, several anthracnose diseases may cause leaves of maple, black walnut, oak or ash to fall in early to mid-summer. Leaf drop usually appears sudden and dramatic. On crabapple, apple scab may cause leaves to drop all season, leaving a sparse-looking tree by the end of the season. On sycamore, powdery mildew may cause leaves to fall from late summer onward. Usually, the number of leaves lost to these types of disease is not significant. If ALL the leaves are lost, the observer might consider treatment of the tree the following year.

*Fatal diseases or injuries: Leaves may fall if a tree has been seriously injured or is in the process of dying. A lightning strike may cause leaves to fall and may lead to death of the tree. Dutch elm disease (of elm) or Verticillium wilt (of maple) may lead to leaf drop. In the case of fatal diseases, the observer
will note that the entire tree is affected, that healthy leaves do not remain on the tree, and that the branches and leaf buds are dead or dying.

C. WHY FRUIT FALLS OFF EARLY. This time of year, the one thing that drives backyard tree fruit fanatics crazy is the sudden loss of young, developing fruit that looks perfect. Early fruit drop in general is most often attributed to poor pollination. The subsequent lack of fertilization of the ovary and seeds is the actual problem; naturally, due to the developing seeds, which regulate the maturation of the pericarp or flesh of the desirable fruit. The seeds release hormones which control the cellular growth and expansion of the pericarp and cause the developing fruit to remain stuck on the tree utilizing all the available resources to mature. Often when any fruit is misshapen, if one cuts into the fruit, it is almost always due to a lack of maturing, viable seeds on the blemished side of the fruit!

So what can cause the lack of pollination and fertilization? Actually, any physical impediment or any physiologically process which affects the flower. For example, wet, rainy, cool weather during bloom, which inhibits bee or pollinator activity; conversely, windy, breezy conditions with temperatures above 95F also will affect honeybee activity. The stigma of most female flowers will have a window of time when they are receptive to pollen and pollination. Higher ambient air temperatures can reduce that window of opportunity. Most male flowers also have a window of time when the pollen is viable and in some species (e.g. pumpkins) high temperatures, above 90F, can cause pollen sterility. Often frosts and freezes will damage the pistil but not the bloom petals nor the ovary.

Regardless of how or what caused the damage, most tree fruits will develop what appears to be a perfectly formed young fruit, which even increase in size for about 25 - 50 days. Then all of a sudden, the young fruit will just fall off of the tree for no apparent reason! This natural fruit drop may occur as a result of excessive fruit load due to ideal conditions during bloom, cold injury damage, unfertilized seeds, spatial competition between fruit on a spur or excessive shading. For most orchardists, this well-known phenomenon of dropping fruit is called "June-drop" because it is most prevalent during the month of June. So next time a favorite tree is loaded with fruit and there is an unknown dropping of fruit, cut open the fruit and check for seed development or more accurately, the lack thereof.

3. BUG BYTES.

A. FALL WEBWORM. Dave Shetlar, Curtis Young, Gary Gao, and Joe Boggs reported running across the small nests of first generation fall webworms (Hyphantria cunea). Observations spanned northwest, central, and southwest Ohio. Fall webworm moths typically have two generations per year in Ohio and despite their common name, first generation nests usually appear in late spring. Fall webworm caterpillars only feed on the leaves that are enveloped by their silk nest. As caterpillars grow in size, they expand their nest by casting silk over more leaves to accommodate their expanding appetites.

First generation nests are seldom as numerous or as large in size as those produced by the second generation; the first generation nests normally involve only a few leaves. However, female moths often lay their eggs on or near the nests from which they developed, thus second generation caterpillars expand the nests once occupied by first generation caterpillars. The second generation nests typically reach their maximum size in the fall which accounts for the common name.

There are two types of fall webworms, known as "races," found in Ohio: the black-headed race and red-headed race. The two differ in coloration and to some extent; the races also differ in host preferences, nesting, behavior, and the timing for spring adult emergence. Caterpillars of the black-headed race have black head capsules and two rows of black bumps (tubercles) running the length of their yellowish-white bodies. Black-headed caterpillars typically feed in a common web until they are half-grown, then they
may separate to produce small, elongated, wispy nets along tree branches that envelope only a dozen or so leaves. Black-headed race moths usually emerge from overwintering cocoons prior to the adult emergence of the red-headed race.

The caterpillars of the red-headed race have red to reddish-orange head capsules and two rows of reddish-orange tubercles running the length of their light to dark tan bodies. Adult moths usually emerge from overwintering cocoons 2-3 weeks after the black-headed race adults have emerged. Red-headed webworms remain together throughout their development to produce truly spectacular multilayered nests enveloping dozens of leaves at the ends of branches. Although first generation female moths of both races often lay their eggs on or near the nests from which they developed, this is behavior is most commonly practiced by the red-headed race which explains their often truly spectacular sized nests. This also explains why the red-headed fall webworms are more destructive than the black-headed race.

The caterpillars of both races may be found on a wide variety of shade, ornamental, and fruit trees and shrubs. Indeed, Gary observed a nest on cultivated blueberries. If first generation nests are few in number and easily accessible, the best control approach is to physically remove and destroy the nests and caterpillars. Insecticide applications should be used sparingly since insecticides may limit the impact of bio-allies. There are over 50 species of parasitoids, and 36 species of predators known to make a living off of fall webworms. In past seasons, parasitoids have proven to be very effective in reducing year-to-year populations of this defoliator.

B. FLEECY FLATIDS. Joe Boggs reported that fleecy white PLANTHOPPER nymphs are appearing on the lower stems of herbaceous perennials and low-growing woody ornamentals in several areas of Ohio. Planthoppers belong to the Family Flatidae (Order Hemiptera; Suborder Auchenorrhyncha), and are sometimes referred to as "flatids." The nymphs of several flatid species cloak themselves in a dense tangle of waxy, white "fluff." They also congregate in groups, or "colonies," and their profusion of flocculent material on affected plant stems draws attention to the insects. The nymphs also produce copious quantities of honeydew which may coat the plant and become colonized by black sooty molds.

Planthoppers are related to aphids and the nymphs are sometimes mistaken for woolly aphids. However, planthoppers … hop. Aphids just mosey around. Planthopper adults are 1/4- 3/8" long, purplish blue, lime green, or powdery white, and they hold their broad wings vertically in a tent-like fashion covering the sides of the body and legs. They usually have little impact on the overall health of landscape plants and seldom become more than a nuisance pest. The nymphs can be washed from affected plants using a coarse stream of water, or killed using an insecticide labeled for use on the host plant.

C. MILKWEED MENAGERIE. A number of plants in the milkweed family (Asclepiadaceae), including COMMON MILKWEED (Asclepias syriaca), have transcended "weed status" in recent years to join the ranks of plant-respectability. They are used in butterfly gardens, landscapes and naturalized areas. Their beautiful forms and flowers are enhanced by their special relationship with the MONARCH BUTTERFLY (Danaus plexippus). However, the monarch caterpillars may be joined by other insect herbivores that also enjoy a "special relationship" with their milky hosts.

Joe Boggs reported that brightly colored RED MILKWEED BEETLES (Tetraopes tetrophthalmus) are currently easy to find feasting on milkweed in Ohio. These tubular-shaped 3/8-1/2" long beetles are orangish-red with black dots and streaks on their upper thorax and wing covers. A close examination of the milkweed beetles will reveal that their prominent black antennae bisect their compound eyes creating two sets of eyes with one set located above the antennae and one set below. The genus and specific epithet of the beetle describes this unusual feature; both are derived from the Latin for "four eyes." The adults feed on milkweed leaves and the larvae bore into the roots and stems.
Like the monarch, red milkweed beetles seek protection from predators by accumulating in their flesh the alkaloid toxins, called cardiac glycosides (cardenolides), which are concentrated in the milkweed's sap. The same is true for MILKWEED TUSSOCK MOTH (*Euchaetes egle*) caterpillars; LARGE MILKWEED BUGS (*Oncopeltus fasciatus*); and SMALL EASTERN MILKWEED BUGS (*Lygaeus kalmii*). Indeed, more than 50 different taxonomic groups of milkweed-herbivorous insects accumulate milkweed toxins. All of these members of the milkweed menagerie advertise their toxic character through splashy coloration, usually involving an orange on black motif; an interesting twist to the old axiom that "you are what you eat."

D. ANT WARS. Dave Shetlar reported observing a fascinating ant spectacle last week that fittingly played out in and around the Rothenbuhler Bee Laboratory; the building housing several OSU Entomology faculty members including Dave. The main players in the event were PAVEMENT ANTS (*Tetramorium caespitum*), a pugnacious non-native species introduced to the US over 100 years ago. The ants get their common name from their habit of nesting beneath the pavement of sidewalks or at the edges of driveways.

Dave reported that the ant incident kicked-off with waves of winged reproductives emerging from a pavement ant colony that had entry points into the building. Soon hundreds of love sick flying ants were cruising around the entomology offices and labs! Regrettably, all of the ant romance filling the air quickly drew the attention of a nearby pavement ant colony and their response to the aerial love-fest was far from amorous. It was Aphrodite meeting Ares; Woodstock meeting Gettysburg!

Pavement ants are very territorial and they produce mating swarms and expand their territories in the spring. However, if two neighboring colonies try to "plant their flags" in each other's territories, total warfare ensues with each colony quickly pouring all their fighting-aged members into melee.

Ant wars may occur as a single, colossal, swirling brawl, with a seething mass of tens of thousands of ants engaged in close quarters tarsi-to-tarsi combat, or as a serious of smaller pitched skirmishes with constantly shifting battle lines. The battles are bloody affairs with macerated bodies quickly piling up. Fortunately for both sides, the wars are usually short-lived lasting only a couple of hours. Unfortunately, Dave could not tell which colony won because neither side wore uniforms.

E. CELEBRATE NATIONAL POLLINATOR WEEK, JUNE 17 - 23. One out of every three bites of food we take comes to us because of animal pollinators. Thanks to a complex assortment of bees, flies and other insects, as well as birds, bats and occasionally other mammals, our markets offer pumpkins, apples, blueberries (and dozens of other pollinator-dependent fruits), and products like sunflower and canola oil. Without these hard-working animals, much of the variety in our diets would be lost.

Everyone's garden can be pollinator-friendly, providing an oasis for native pollinators as they go about their work. By providing plants, shelter, water and a friendly environment for pollinators, gardeners can create habitat links that otherwise might be missing. To create a pollinator-friendly garden, consider the following practices:

* Create foraging habitat by including plants in the landscape that flower from spring through fall. A consistent diet of nectar and pollen throughout the season helps to ensure plenty of offspring and a healthy breeding population for next year. Favorite bee plants include many popular sun-loving perennials, such as bee balm, purple coneflower, thyme, catmint, mint, hyssop and asters. Annuals such as sunflowers, zinnia and calendula are also attractive to bees. Watch the garden, and bees will indicate with their visits which plants they prefer.
* Create nesting habitats for solitary bees such as mason bees. These gentle bees are extremely efficient pollinators, and they will move into created nests. Find information on building habitat at The Xerces Society for Invertebrate Conservation website ([http://www.xerces.org](http://www.xerces.org)).

* Reduce pesticide use. When selecting pesticides, make choices with the least impact on pollinators. Insecticidal soaps and horticultural oils are good choices, because they don't leave a residue on plants that can kill pollinators. Dusts are the most harmful to pollinators because the poison sticks to their bodies like pollen. Keep in mind that fungicides, herbicides and other pesticides can harm bees, not just insecticides.

* Learn more about the plight of pollinators. The Xerces Society ([http://www.xerces.org](http://www.xerces.org)) and the Pollinator Partnership ([http://www.pollinator.org](http://www.pollinator.org)) are two organizations committed to preserving pollinator populations. Many excellent books have been published on pollinator conservation. Look for Attracting Native Pollinators, published by the Xerces Society, and The Forgotten Pollinators, by Stephen Buchmann and Gary Paul Nabhan.

F. BOXELDER BUGS ON THE RISE. 2012 was a banner year for the boxelder bug. Toward the end of summer and into the fall, numerous reports, questions and complaints were registered in Ohio about massive numbers of boxelder bugs collecting at bases of trees, in herbaceous plantings and assorted other locations, home invasions and difficulties in ridding the interlopers from landscapes. Eventually, the boxelder bugs reached their adult stage and disappeared into overwintering sites (under bark of trees, in hollow logs, in leaf litter, in wall voids and attics of homes, etc.) to be largely forgotten for the rest of the year.

Now spring has sprung, the overwintered adults have re-dispersed into the landscape, and a new generation of boxelder bug nymphs are once again generating questions and complaints. Curtis Young and Joe Boggs reported receiving calls from concerned homeowners wondering what all the little red and black bugs are that are showing up in yards, gardens and on walls of houses. Some are worried that they are ticks or spiders, while others have no clue. Curtis also reported observing numerous boxelder bug egg masses in maple trees near Findlay, Ohio.

Boxelder bugs are typically considered to be a seed feeder, especially on the seeds of female boxelder trees. However, they also feed many of the other maple trees, still bearing seeds as well as on foliage and young, green stems. It has also reported that they will feed on herbaceous plants under host trees. Dave Shetlar reported that he has observed late maturing nymphs cannibalizing younger nymphs late in the fall. This being a last ditch effort to reach adulthood before the onset of winter.

Boxelder bug management may include destruction of host trees, especially female boxelder trees, elimination of hiding sites, physical exclusion from homes and insecticide treatments. However, insecticide sprays are not generally recommended for boxelder bug management. They are often no more effective than hosing the bugs down with a forceful stream of water from a garden hose (apparently boxelder bugs are easily drowned), and repeated applications may be required. Insecticidal soap applied in a forceful spray of water may reduce populations on tree trunks. Pyrethroid insecticides are available for treating foundation walls around the perimeter of buildings. Do not use insecticide sprays for boxelder bugs inside the home. Vacuuming to remove the intruders is the most acceptable method of control once they have reached the interior of a structure.

G. WINDSHIELD WIPES. BYGLers also ran into a number of other insect pests this week including:

* Curtis Young and Joe Boggs shared images with BYGLers of early and late instar WHEEL BUG (Arilus cristatus) nymphs. With their long, spindly black legs, and their habit of holding their brightly
colored orangish-red abdomens in an almost vertical position, the nymphs are often mistaken for spiders. Early instar nymphs are also sometimes mistaken for ants. The nymphs will eventually grow up to become one of the largest land-based true bugs (Order Hemiptera) in North America; adults measure more than 1.25" in length. The bug's common name comes from the peculiar cog-wheel-like structure that rises from the top of the adult's thorax. Wheel bugs are accomplished predators. Both the nymphs and adults are equipped with piercing-sucking mouthparts that are used to inject paralyzing and pre-digestive enzymes into their prey. They then use their mouthparts like soda straws to suck the essence-of-insect from their hapless victims.

* Joe also shared images of the HICKORY SAPERDA (Saperda discoidea), a longhorned beetle (Family Cerambycidae) tree borer that is commonly found flying around porch lights at night. Longhorned beetles are so named because of their unusually long antennae. The cylindrical hickory saperda beetles measure slightly over 1/2" in length. Females are more colorful than the males. The female's legs and wing covers (elytra) are reddish-brown and their head, thorax, and the edges of their elytra are covered with yellowish hairs. The same colored hairs form a half-disk marking at the top of their elytra and two irregularly-shaped markings in the middle of their elytra. Males have uniformly brown or black bodies that are sparsely covered with gray hairs.

Hickory saperda larvae look like typical cerambycid larvae (= roundheaded borers); segments towards the front of the fleshy, thin-skinned, yellowish-white larvae are larger in diameter than the rest of the segments. The larvae confine their tunneling and feeding activity to the phloem; however, as they gain girth, the larvae will etch the outermost xylem ring. The hickory saperda is considered a secondary borer; it only targets dying or dead trees. While hickory is the preferred host, the borer may also be found on black walnut and butternut. There is one generation per year in Ohio.

4. DISEASE DIGEST.

A. THOUSAND CANKER DISEASE UPDATE. As reported by Ohio Department of Agriculture (ODA) on June 6, more WALNUT TWIG BEETLES were found in traps set by ODA officials near walnut trees in Butler County. Beetles were found in 9 of 26 traps. As the release stated, this is the second time Walnut Twig Beetles has been detected in Butler County. In late 2012 the beetles were found in traps set by Ohio Department of Natural Resources Division of Forestry officials near a wood processing business. ODA officials have quarantined walnut products that have the potential to spread the pest from leaving the site of discovery.

The THOUSAND CANKER DISEASE (TCD) is caused when the Walnut Twig Beetles, which carry a fungus, bore into the branches and trunk tissue of walnut trees. The tree suffers repeated infections caused by the fungus and eventually dies. There is no known cure for TCD. The disease was first found in Colorado in 2003 and has since been detected in 13 other states. In September 2012, ODA enacted an exterior state quarantine regulating the transportation of walnut products from areas of the affected states.

At this time, ODA will move to expand its TCD quarantine to include Butler County. Ohio's updated quarantine, enforced by the ODA's Plant Health Division, would add Butler County and other newly infested counties in other states. The quarantine would restrict walnut materials from entering Ohio from areas where TCD has become established. Restricted products originating from or traveling through the regulated areas include walnut nursery stock, unprocessed walnut lumber, or any other walnut material, such as logs, stumps, roots, branches, mulch, wood chips and all firewood. Exemptions to the quarantine are nuts, nut meats, hulls, processed lumber (bark-free and kiln-dried) and finished wood products without bark, such as walnut furniture, instruments and gun stocks. Landowners and homeowners are strongly encouraged to watch for signs of TCD on their walnut trees. Symptoms of TCD vary, but commonly
include thinning crowns, yellowing or wilted leaves in the crown, leaves that are smaller than normal and limbs that died recently.

To see ODA's press release in its entirety go to:
http://www.agri.ohio.gov/public_docs/news/2013/06.06.13%20Officials%20Detect%20Walnut%20Twig
%20Beetle%20in%20Butler%20County.pdf

5. TURF TIPS.

A. ANNUAL BLUEGRASS WEEVIL. Dave Shetlar reported that damage caused by first generation annual bluegrass weevil, *Listronotus maculicollis* (previously called the *Hyperodes* weevil) is becoming very evident in northeast Ohio where the weevil is currently concentrated. This native weevil targets its namesake host, annual bluegrass (*Poa annua*), which was once only considered a difficult to control weed-grass. However, as annual bluegrass has gained status as a cultivated grass on golf course tees, greens, and fairways, annual bluegrass weevil has gained status as a significant pest. The weevil is particularly damaging to close-cut annual bluegrass.

As with other members of the "snout weevil" family, Curculionidae, annual bluegrass weevils have their mouthparts at the end of a snout. The black colored adults are around 1/8" long and rough-textured with small hairs and gold scales on their wing covers (elytra). Annual bluegrass weevils are about half the size of bluegrass billbugs (*Sphenophorus parvulus*), another important turfgrass weevil pest. The two weevils can be distinguished by their vast size difference and by the attachment points of their antennae: billbugs have their antennae attached at the base of their snout; the antennae of the annual bluegrass weevil are attached near the tip of their snout. Adult bluegrass weevils feed by chewing notches in the edges of grass blades and while the damage is insignificant, notched blades is an important indicator that weevils are afoot.

Adults spend the winter hiding in protected sites such as in the duff beneath trees within or near the golf course. As temperatures warm in the spring, the adults return to the turfgrass to eggs. They chew a hole through the outer blades of the sheath to lay eggs between the leaf sheath and the stem. Once the eggs hatch, early instar larvae feed as stem borers and they fill their excavated tunnels with sawdust like frass; the signs and symptoms are very similar to those produced by billbug larvae. Older larvae drop to the ground and tunnel to feed on turfgrass roots and crowns. The larvae are creamy white and legless, a feature that distinguishes them from white grubs. The weevils may complete two generations per season.

The larval feeding damage on close-cut annual bluegrass causes plants to turn brown and collapse. The symptoms may appear on golf course tees and greens as small brown, depressed spots, very similar in appearance to symptoms of leaf anthracnose disease. Fortunately, the same tried-and-true "tug test" used to diagnose billbug damage will also reveal an annual bluegrass weevil infestation. A slight tug of the grass will disclose the hollowed-out frass-filled stems produced by larval stem boring activity. Unfortunately, curative applications of contact insecticides made once symptoms appear will provide limited control. Preventative applications made in the spring prior to the weevils laying their eggs are far more effective.

6. INDUSTRY INSIGHTS.

A. WHITE PINE WEEVIL DAMAGE BECOMING EVIDENT. Joe Boggs reported that white pine weevil (*Pissodes strobi*) larval feeding damage is now becoming very evident in southwest Ohio. In early spring, overwintered females deposit eggs in the terminals of a wide range of conifers including Douglas-
fir and all spruces as well as Scotch, jack, red, pitch, and eastern white pines. After the eggs hatch, the resulting white, legless, slightly curved, grub-like larvae tunnel downward just beneath the bark feeding on phloem tissue until pupation. The tops of weevil infested trees become wilted, turn brown, and die. Main leaders are often curved into a "shepherd's crook."

Removing the paper-thin bark from infested leaders will reveal reddish-brown frass (insect excrement) and weevil larvae. As the larvae near pupation, they excavate tub-shaped chambers in the xylem and surround themselves in Excelsior-like wood fibers. This forms so-called "chip-cocoon" within which the larvae pupate. New adults emerge through the bark creating small, round exit holes. The adults mate and feed on bud and twig tissue; however, their damage is inconsequential. The weevils then move to the duff beneath conifers to spend the winter.

Years of successive weevil damage to terminal leaders will eventually create "cabbage trees" which are short, squat trees with multiple terminal leaders. The weevil is common to the northeast part of the state and it is becoming common to central Ohio; however, it remains less common in the southern part of the state. Consequently, the weevil damage may be misdiagnosed or go unnoticed allowing localized populations to expand. Indeed, Joe noted that the trees he observed in a southwest Ohio landscape were developing a cabbage-form indicating that weevils have been active for multiple years.

There is one generation per year and populations may be reduced by removing the infested terminals before adult weevils emerge. Wilted terminals should be pruned from trees and the cut ends closely examined to determine if the entire infestation has been removed. Infested material must be destroyed since the weevils will complete their development in cut tops left on the ground. Pruning and destroying the infested terminals remains a viable control option if no exit holes are found.

If exit holes are found, it is not too late to control the weevil by removing infested terminals. However, it is not too late to cut-out damaged tops and to begin training a lateral branch to become a new terminal. It is also not too late to consider insecticide options for managing this insect. A soil drench or soil injection application of imidacloprid (e.g. Merit, Xytect, etc.) in the fall has been shown effective in protecting trees against white pine weevil infestations the following season. This application is generally only considered economically feasible for landscape trees and should be reserved for landscapes that have a history of white pine weevil activity.

B. GET YOUR GREEN INDUSTRY FIX WEBINAR: JULY 10. We had a great Webinar session on rose rosette disease, the many names of trees, and insect galls this past Wednesday. Next up: Wednesday, July 9, 8:00 - 8:50 a.m. Join OSU Buckeye Yard and Garden Line (BYGL) experts for this Ohio Nursery Landscape Association's Green Industry Webinar then. If you have questions about registering, contact ONLA at 614-899-1195 or 800-825-5062.

7. WEATHERWATCH.

A. WEATHER UPDATE. The following weather information summarizes data collected at various Ohio Agricultural Research Development Center (OARDC) Weather Stations spanning the dates from June 1 - 19, 2013, with the exception of the soil temperatures which are readings from Wednesday, June 19, 2013 at 5:05 p.m.

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<td>Ashtabula</td>
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<td>70.0</td>
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For a link to the OARDC Weather Stations, visit: [http://www.oardc.ohio-state.edu/centernet/weather.htm].

B. GROWING DEGREE DAYS (GDD). 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 809 to 1,131. Following is a report of GDD for several locations around Ohio as of June 19, 2013: Painesville, 809; Cleveland, 835; Toledo, 928; Canfield, 870; Findlay, 947; Van Wert, 958; Wooster, 908; Coshocton, 1,029; Columbus, 1,139; Springfield, 1,073; Dayton, 1,076; Cincinnati, 1,109; Ironton, 1,118; Portsmouth, 1,120; and Piketon, 1,131.

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 website, one can see what is taking place in the landscape.

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; oakleaf hydrangea, first bloom, 835; cottony maple scale, egg hatch, 851; panicle hydrangea, first bloom, 856; fall webworm, egg hatch (first generation), 867; mimosa webworm, egg hatch (first generation), 874; fuzzy deutzia, full bloom, 884; winged euonymus scale, egg hatch, 892; spruce bud scale, egg hatch, 894; winterberry holly, full bloom, 897; paniced goldenraintree, first bloom, 924; June bride littleleaf linden, first bloom, 953; azalea bark scale, egg hatch, 957; Japanese beetle, adult emergence, 970; rosebay rhododendron, first bloom, 1,010; June bride littleleaf linden, full bloom, 1,115; bottlebrush buckeye, first bloom, 1,158; Ural falsespirea, first bloom, 1,170; paniced goldenraintree, full bloom, 1,251; Rose-of-Sharon, first bloom, 1,347; pine needle scale, egg hatch - 2nd generation, 1,349; mimosa webworm, egg hatch - 2nd generation, 1,920; euonymus scale, egg hatch - 2nd generation, 1,923; magnolia scale, egg hatch, 1,938; and banded ash clearwing borer, adult emergence, 2,195.

This will be the last reporting of GDD for this year. Most locations for which GDD is being reported have accumulated enough GDD's to have exceeded most of the pests and flowering plants that are included in the phenology table. Reporting of GDD will return in next year's BYGL. Thanks for following along!

8. COMING ATTRACTIONS.

A. OHIO'S INVASIVE SPECIES SERIES, JUNE 2013, OSU MANSFIELD CAMPUS. Invasive species come in all shapes and sizes. Whether a plant, insect, fungus or vertebrate, each invasive species
impacts their segment of the ecosystem in different ways. This seminar series focuses on some of the key issues associated with non-native, as well as how to identify them and deal with them in your own backyard.

*June 25 - The last seminar session will focus on specific non-native invasive plants. Characteristics for identification will be covered along with control options.

Registration for each seminar is $15 OR register for all 4 seminars for $45. Information can be found on the website at [http://woodlandstewards.osu.edu].

B. DIAGNOSTIC WALKABOUT FOR THE GREEN INDUSTRY. Diagnostic Walkabout for the Green Industry series is once again occurring around Ohio this summer. ONLA, AGI and OSU Extension will be hosting 6 more events in 2013: June 27, BGSU Firelands, Huron; July 18, Mingo Park, Delaware; August 1, Stan Hywet Hall and Gardens, Akron; August 15, Toledo Botanical Gardens; September 12, Inniswood Metro Gardens, Westerville; September 26, Sunset Memorial Park, North Olmsted. Pre-registration is required and class size is limited to 30 per class. ODA, ISA and OCNT credits available. For registration, location and pesticide credit information see: [http://www.onla.org].

C. TCD WORKSHOP. On Wednesday, July 31, 2013, a workshop will be held in Hamilton, Ohio to discuss THOUSAND CANKER DISEASE ON WALNUT. The program will be held at the Butler County Extension and include both an indoor and outdoor portion. Information, including a flyer about the workshop can be found on the Woodland Stewards website at [http://woodlandstewards.osu.edu/]. The workshop runs from 9:00 a.m. - 3:45 p.m. Registration cost is $20.00 per person. Questions about the program can be directed to Kathy Smith at 614-688-3136.

D. YOUTH SCIENTIST ADULT EDUCATION CLASS. OSU Extension, USDA Forest Service, Ohio Woodland Stewards, and the Ohio Environmental Protection Agency- Ohio Environmental Education Fund are sponsoring an adult education class August 8-9, 2013. This class will showcase a new hands-on curriculum being developed for youth to learn about invasive species utilizing their own neighborhoods, school yards, and local parks. This curriculum fulfills newly revised State science curriculum standards. The program will be held at the OSU Mansfield campus and includes lots of hand-on activities! Information about the workshop can be found on the Woodland Stewards website at [http://woodlandstewards.osu.edu]. The workshop runs from 9:00 a.m. Thursday through 3:00 p.m. Friday. Registration cost is $225 with Graduate Credit or $50 without graduate credit. Deadline for registration is July 31, 2013. Questions about the program can be directed to Cindy Meyer at 513-887-3722.

9. BYGLOSOPHY. "On every stem, on every leaf ... and at the root of everything that grew, was a professional specialist in the shape of grub, caterpillar, aphis, or other expert, whose business it was to devour that particular part." - Oliver Wendell Holmes

APPENDIX - ADDITIONAL WEBSITE RESOURCES:

Ask a Master Gardener Volunteer (Consumer Gardening Questions)
http://mastergardener.osu.edu/ask

Buckeye Turf
http://buckeyeturf.osu.edu

Emerald Ash Borer Information
http://ashalert.osu.edu
Growing Degree Days and Phenology for Ohio
http://www.oardc.ohio-state.edu/gdd/

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

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

Ohio State University Extension Master Gardener Volunteer Program
http://mastergardener.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 18th conference call: Barb Bloetscher (Ohio Department of Agriculture); Joe Boggs (Hamilton); Julie Crook (Hamilton); Erik Draper (Geauga); Gary Gao (Hort and Crop Science); Denise Johnson (State Master Gardener Volunteer Program); Ashley Kulhanek (Medina); Cindy Meyer (Butler); Dave Shetlar (Entomology); Paul Snyder (OARDC and Secrest Arboretum); Amy Stone (Lucas); and Curtis Young (Van Wert).

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

BYGL is a service of OSU Extension and is aided by support from the ONLA (Ohio Nursery and Landscape Association) [http://onla.org/; http://buckeyegardening.com/] to the OSU Extension Nursery, Landscape and Turf Team (ENLTT). Any materials in this newsletter may be reproduced for educational purposes providing the source is credited.

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.

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Keith L. Smith, Associate Vice President for Agricultural Administration; Associate Dean, College of Food, Agricultural, and Environmental Sciences; Director, Ohio State University Extension and Gist Chair in Extension Education and Leadership. TDD No. 800-589-8292 (Ohio only) or 614-292-6181.